AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

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President's Report

New Look = Old Look

My term as President began in an unusual way, with a concerted effort by the entire Executive Committee to find a new headquarters staff. As many of you know, Dawn Wheeler resigned last fall to take a new position at the University of Maryland. Our capable bookkeeper, Muriel Daley, left at about the same time, and our excellent web assistant, Aileen Gormley, has also left our service. Dawn and Muriel have continued to work part-time for the past several months, along with temporary staff, as we converted to a new office. We are grateful to all of them for their loyalty to AWM and will always remember their years of faithful service. At the Joint Mathematics Meetings, AWM members and others met to wish Dawn well. We surprised her with a parting gift at the AWM reception. In this message, I applaud her stewardship of our office for so many years, as well as her help in making the transition to new staff.

I am delighted to report that as of April 1, AWM has a new headquarters and new staff. Our new managing director is Jennifer Lewis, and she is supported by a staff of specialists, whose names and contact information appear below. Our new address is:

Association for Women in Mathematics
11240 Waples Mill Road
Suite 200
Fairfax, VA 22030
Phone: 703-934-0163; Fax: 703-359-7562

The people we will be working with are:

Jennifer Lewis, Managing Director, x113
Debra Fernandez, Membership Director, x106
Danielle Burns, Meeting and Events, x109
Maria LeDoux, Administrative Coordinator, x101
Valarie Ogoh, Accounting, x107

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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.

Circulation: 4000.

Within the next few months, our web pages will move ("migrate") to a new URL, and there will be new e-mail addresses for our staff. The old addresses will continue to work for a quite a while.

How have we managed to suddenly increase the number of people working for AWM? (And I have not even mentioned additional people such as the technical staff who will manage our membership database and update our web ads.) After a long search and much deliberation, we have contracted with an Association Management Company (AMC), STAT Marketing, to "run" our association. What have we lost and what have we gained by this? It's important to recognize that we have not lost our identity: the voice that answers the phone (it is a recorded voice, and directs the caller to one of the five extensions above) is Jennifer's, and it says "Association for Women in Mathematics." All of "our" staff also manage the operations of other associations, so they are thinking about us only part of the time. Because they are experts in their different specialties, they (and we) expect that they will be able to help us quite efficiently, and that the new way of operating will not be any more expensive than the old. Jennifer will, we hope, attend the SIAM meeting in July and the Joint Math Meetings next January. Please make a point of introducing yourself to her if you are at either meeting.

STAT Marketing is a small, independently owned AMC in the DC area. The owner, Sharon Galler, and her husband Jerry (who was a math major in college, spent much of his career in the computer industry and now helps manage the company), are veterans of the "association business." Listening to them has reassured us that some of our difficulties (why is everything done at or after the deadline?) are common to all groups like ours, while others (can we bring our database up to date?) can be handled by using technology that we were too small to manage independently. We can use wheels that others have invented, while STAT seems excited by the prospect of being involved with a women's organization.

After June or so, we will be giving up our space at the University of Maryland, a place that has shown us wonderful hospitality over many years. Another thing AWM will never forget is how important was the intervention of Maryland in the history of AWM. We have received support at many levels, especially from the Department of Mathematics and the College of Computer, Mathematical and Physical Sciences; support in the form of rent-free quarters, donations of furniture and equipment, and the use of campus services. We hope that the university has also benefited from the association with us, as AWM has grown in stature, and that we have brought some of our values to the campus. We expect that our warm relationship will continue.

Overall, we hope and expect that for most members, the change to a new set of people in the head office, and in the location of the office itself, will not even be noticed. In a little while, as we "modernize," you will find subtle changes: electronic membership queries and renewals; electronic submission of nominations and travel grant applications; and quicker updates of information

to the Combined Membership List. We want our new look to be the same as our old look—except for improvements.

The Climate for Women

The opinions of Lawrence Summers on the place of women scientists in academia serve to remind us that we live in "interesting times," in the words of the old Chinese curse. But what is a curse for an individual trying to make her personal and professional way in the world also serves to remind us that AWM was founded in even more interesting times, and that the need for the work of AWM continues. A number of members (and even some nonmembers) have appealed to the officers of AWM to voice strongly our reactions to this apparent disparagement of women's ability to have an impact on science, and particularly on women's potential for success in mathematics. And AWM rose to the occasion, with Carolyn Gordon's positive but strong letter appearing in the *New York Times* at the end of January. (This letter was reprinted in the March–April *Newsletter*.) Other statements have appeared on the websites of a number of national and international Mathematical Societies and Institutes—many of them prompted by suggestions from AWM members.

The story is far from over. Besides reminding us of our responsibility to respond as publicly as we can in situations like this, and of the need for us to stay informed, we find AWM in demand as a resource for people looking for remedies. I have been asked for information on "studies of hidden biases," and, passing the query on to the informal e-mail list of past presidents and other interested people that has developed, I received a large number of useful replies. My own take on this (as I have said more than once) is that the profession lacks good ways of evaluating the potential of talented young women. Many of us who have succeeded in a "man's world" have done so despite not having looked like the standard model for success and leadership when young. And yet we find that the "standard model" has not changed nearly enough. How do we expect the next generation of women leaders to look? How do we learn to identify and to nurture the essentials for success in women mathematicians, and how do we teach academic administrators to recognize the signals? The world will be looking to AWM and to like organizations in other fields of science to reply to these questions. Together we must begin to develop answers.

MEMBERSHIP AND NEWSLETTER INFORMATION

Membership dues

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

Subscriptions and back orders

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

Payment

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

Newsletter ad information

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

AWM ONLINE

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

Website and Online Forums
http://www.awm-math.org

AWM-Net Editor
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AWM-Net
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:
October 1, 2005 and February 1, 2006 (pending funding)

Sonia Kovalevsky High School Mathematics Days: August 4, 2005

AWM Workshop, January 2006:
September 1, 2005

Schafer Prize, January 2006:
October 1, 2005

Noether Lecturer nominations for 2007:
October 15, 2005

AWM Essay Contest: October 29, 2005

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AWM Activites at the SIAM Meeting

AWM members and supporters will gather for a strong set of scientific talks, posters, and career development advice at the SIAM Annual Meeting in New Orleans, July 11–12, 2005. The AWM Workshop begins with the AWM-SIAM Sonia Kovalevsky Lecture on Monday afternoon at 3 p.m. This year's award-winner and speaker is Ingrid Daubechies.

The workshop, organized by Suzanne Lenhart, University of Tennessee, and K. Renee Fister, Murray State University, continues with a number of events over the next day and a half. The overall theme, "Focus on Research and Career Experiences," will be presented in two scientific minisymposia, an AWM poster session and a panel discussion. On Monday afternoon, following the Kovalevsky Lecture, the minisymposium topic is "Differential Equation and Dynamical Systems Applications." It will feature talks by recent women Ph.D.'s on modeling applications of differential equations and dynamical systems. The applications will include a nonlinear difference equation model for community intervention in mosquito control, a compartment-based model for determining the virulence of HIV-1 epidemics, a study of the key factors of complex ecosystem dynamics, and non-linear convective instability of fronts. The speakers are Anna Ghazaryan, Mihaela Predescu, Brandy Rapatski, and Irina Tikhonova.

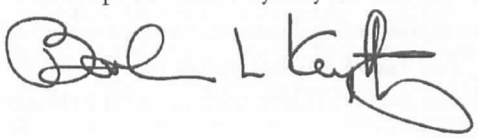
On Tuesday morning (10:30–12:30) there will be a minisymposium/panel discussion on "Career Transitions," featuring talks about transitions in careers including changing locations, research focus, and type of job. The different types of responsibilities in a career progression will be discussed. Such issues should be of interest to mathematicians at various career levels. The speakers are Belinda Batten, Bettye Anne Case, Holly Gaff, and Thaleia Zariphopoulou. On Tuesday afternoon the second research minisymposium is on the topic "Optimization, Control, and Numerical Methods," with speakers Urmi Ghosh-Dastidar, Fengyuan Li, Sarah McAllister, and Norma Ortiz. The topic is modeling applications of mathematics in relation to optimization and control with emphasis on numerical solu-tions. The applications include a hybrid method related to simulated annealing for global optimization, implementation of locally divergence-free discontinuous Galerkin methods for solving Maxwell equations, numerical approximations of semigroups, and a decoupling technique for the neutral problem of Bolza.

Finally, on Tuesday evening, AWM is sponsoring a number of graduate student poster presentations at a joint AWM-SIAM poster session. The AWM presenters are Erika Asano, Corina Constantinescu, Wandi Ding, Nicoleta Tarfulea, Kening Wang, and Yan Zhao.

The SIAM meeting will feature a large number of plenary sessions, minisymposia and contributed paper sessions. For the complete program,

see www.siam.org/meetings/an05/program.htm.

I hope to see many of you there.



Barbara L. Keyfitz
Toronto, Canada
March 31, 2005

Letter to the Editor

To the Editor:

I wish to add my voice to what I am sure will be lots of comments about the Summers speech. The full text of the Summers speech can be downloaded from http://www.president.harvard.edu/speeches/2005/nber.html.

I have several things to say about it.

(1.) I found his speech (the full text, not the little quotes which were out of context) to be carefully reasoned. I also thought that Summers' basic good will shone through. And while I see many more reasons than the ones that he listed why women might have a really hard time achieving in what he calls the "high end" of the profession, I don't feel that there is anything wrong in asking the question: is there an innate difference in mathematical aptitude between women and men at the high end? How can women work in a profession which is as exacting as ours, with its unyielding insistence on truth and clarity of thought, and refuse to look at any possible explanation, no matter how unpalatable? And how can anyone who teaches mathematics, or has contributed even a little bit to research, not had to face the fact that most days a few more points of IQ sure would help the research.

(2.) The profession as a whole has shown increasing good will toward women. For example, every year I hear of new mathematical couples who solve the excruciating two-body problem with two jobs in the same university, and I understand how hard that has to be for a department, and also remember the nepotism rules when I started out.

(3.) There *is* a problem of the absence of tenured women at most of the top 15 universities in the NAS surveys, and I suspect in similar ones all over the world. To be sure, the number of women undergraduate math majors at these universities is growing rapidly, and that's great. But the percentages go down, in the women applicants to graduate school. At my university (Columbia), it's not because Columbia is prejudiced against them, I've been part of the process, and I just don't think it's so. Rather, while Columbia makes a good number of offers to women it always turns out that, out of proportion to the total numbers, the same top women candidates are also admitted to Harvard, Princeton, MIT, Yale, Berkeley, etc., etc., so that all the top schools are fighting over a small number of applicants. The number of women postdocs at the same schools is smaller still, and the number who do striking enough work to go on to tenure in the same schools is tiny. (Remark: as a rule, tenure at the sort of school that I am thinking of usually does not come after a tenure-track job, but rather as a result of several strikingly original pieces of work, done long enough after the Ph.D., when the individual has clearly separated herself/himself from the thesis advisor.) The need for the AMS Satter Prize, which is explicitly for women, is still there, because women are almost never awarded any of the other prizes. Finally, there have not been any women Fields medalists.

(4.) But there is more than that. The storm that was released after Summers' speech had to do with much broader issues. It also had to do with Summers speaking out against campus anti-Semitism at Harvard, and rebuking Cornell West when he was a distinguished Professor in the Harvard African-American Studies department, and asking unwelcome

questions about how Harvard allocates its resources. (A choice Summers quote is "Academic freedom is wonderful, but it really doesn't have a place in the purchase of cement.") And while I am glad that the AWM is there to come to the defense of women in mathematics, I do think that it's long past the time for the organization to realize that it is part of a much larger world, in which there are many many issues that are intertwined and that you cannot always separate gender, i.e. women in math, from other factors.

Sincerely,

Joan S. Birman
Professor Emeritus, Barnard College,
Columbia University
Research Professor of Mathematics

Op-ed

23 January 2005, submitted to the Boston Globe, by Mary Beth Ruskai (©2005 by the author; reproduction for non-commercial purposes permitted) [The Globe did not accept the Op-Ed for publication; we are pleased to print it here with a section Beth has added for AWM.]

I had hoped that I could resist the urge to comment on Harvard President Larry Summers' remarks about women; however, none of the responses I've read adequately addressed one question. Even if Summers lacked tact, was it legitimate to call for research on the question of whether women have less innate mathematical ability?

As a scientist, I've learned that progress requires the acceptance of well-verified theories as well as the willingness to consider new hypotheses for unexplained phenomena. Engineers trying to design better cooling systems do not waste time with proposals that violate the second law of thermodynamics. In 1986, the British Royal Society (hardly a bastion of radical feminist theory) concluded that there was no convincing evidence for innate gender differences in mathematical ability.

NSF-AWM Travel Grants for Women

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

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

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

Target dates. There are three award periods per year. An applicant should send *five* copies of 1) a cover letter, including the conference name, conference dates and location (city/state/country), and amount of support requested, 2) a description of her current research and of how the proposed travel would benefit her research program, 3) her curriculum vitae, 4) a budget for the proposed travel, and 5) a list of all current and pending travel funding (governmental and non-governmental) and the amounts available for your proposed trip to: Travel Grant Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. If you have questions, contact AWM by phone (703-934-0163) or e-mail (awm@math.umd.edu). Applications via e-mail or fax will not be accepted. The next two deadlines for receipt of applications are October 1, 2005 and February 1, 2006. Funding is pending.

Does Summers have new evidence that would call for reopening this question?

Had he been addressing a group of biologists, would he have tried to provoke them by suggesting that they reconsider creationism? Would he have asked nuclear physicists to re-evaluate cold fusion? Would he have suggested that astronomers reconsider the possibility that the sun revolves around the earth? Will he urge the medical school to appoint homeopathic practitioners to the faculty?

Fifteen years ago I spent several months examining the literature on the "gender gap" in mathematics. I started out wondering why one would hypothesize that test differences which emerge near puberty, when social pressures reach their peak, would be the result of genetics rather than culture. But I soon discovered that the widely accepted "gender gap" in mathematics tests was largely a myth. Even when differences exist, the effect of gender is much smaller than other factors. Anyone who doubts this should take a serious look at the reports from the Trends in International Mathematics and Science Study conducted in 1995, 1999 and 2003. The few gender differences that emerge vary with the country studied and are much, much smaller than the differences between countries.

What about the widely publicized SAT gender gap? When one experiment is inconsistent with others, scientists examine it for hidden flaws and subtle defects. Because SAT scores depend on too many parameters to discuss here, I'll mention only one that is not widely known. Among those taking the test, girls are much more likely than boys to come from low-income families and to have parents whose formal education did not go beyond high school. The male and female cohorts are so dissimilar that the annual College Board announcement that the "gender gap" in math has gone up or down by 1 or 2 points is not just meaningless, it's irresponsible.

I have not examined the literature as thoroughly as I did in 1990; there's no new evidence that would merit taking time away from my research in quantum information. Quantum theory is also a subject with a long history of controversy and skepticism. But scientists have begun to exploit features long regarded as paradoxical to build quantum computers and find new ways of making data transmission secure. Full acceptance of quantum theory has led to practical applications, and new experimental evidence for its validity.

What could be accomplished if, instead of diverting women from scientific research, we accepted them without constantly questioning their ability?

Addendum for *AWM Newsletter*

I wrote the item above not because I cared that much about what Summers said, but because of the potential impact of the subsequent news coverage on the perceptions of the general public. Although I deliberately avoided going back over all the data, there are a few comments I would like to add.

Even some of the better news articles contained statements that were misleading or easily misinterpreted, especially if quoted out of context. One of these appeared in the *New York Times*, 24 January 2005, in "Gray matter and the sexes: still a scientific gray area" by Natalie Angier and Kenneth Chang. Midway through the article is this paragraph:

> Nor is the masculine edge in math unique to the United States. In an international standardized test administered in 2003 by the international research group Organization for International Cooperation and Development to 250,000 15-year-olds in 41 countries, boys did moderately better on the math portion in just over half the nations. For nearly all the other countries, there were no significant sex differences.

I believe this is the TIMSS study reported at http://nces.ed.gov/timss/ (the test is given to 4th as well as 8th grade students). I do not recall seeing the statement above and do not know if it is the result of careful statistical analysis or simply a reporter's impressions of the data. But is doesn't really matter. These tests were given in 1995, 1999, and 2003 (in 26, 38 and 41 countries respectively). The executive summary of the report from 1999 states on page 4:

> The difference in average achievement for boys and girls was negligible in most countries, except [4 countries listed; emphasis added],

and similar results were found for the 1995 study. If the *Times* article is accurate, the number of countries with significant gender differences jumped from 4 in 1995 and 1999 to over 20 in 2003. To attribute these results to "innate differences" one would have also to hypothesis a significant change in the gene pool between 1999 and 2003. In fairness, I should add that the *Times* article did also report that the differences between countries varied widely.

As this story progressed, particularly after the transcript of Summers' comments was released, the focus shifted to theories that emphasized the larger M:F ratio in the tail of the curve, rather than averages. But this is hardly a new

theory. It received wide prominence after Benbow and Stanley's 1980 *Science* article asserting gender differences. This has been hashed over so thoroughly and frequently that it hardly merits further discussion. However, one of the arguments for attributing their high M:F ratio to innate gender differences was that (as Benbow asserted in 1988) it was "relatively constant over...15 years at about 12:1." In 1988 and 1989, their data gives ratios of 4:1 and 8:1 respectively. By the 1990s this change could not be ignored, and the Johns Hopkins University web page www.jhu.edu/~gifted/ research/biblio.html reports that

> ...the ratio of males to females scoring at this level is considerably less than was evident in the talent searches conducted in 1980–1982,

citing L. E. Brody, L. B. Barnett, and C. J. Mills, "Gender differences among talented adolescents: Research studies by SMPY and CTY at The Johns Hopkins University," pp. 204–210 in K. A. Heller and E. A. Hany (Eds.), *Competence and Responsibility: Proceedings of the Third European Conference of the European Council for High Ability* (1994, Seattle, WA: Hogrefe and Huber).

Benbow and Stanley's work at Hopkins used scores of 7th graders on the math SAT. What about high school seniors, for whom the test is intended? For the 10-year period 1974–83, the M:F ratio among "high-scorers" was about 4:1, but by 2003 it was down to 2:1. (In both cases slightly more for scores over 750, slightly less for scores over 700.) Now, I am reluctant to give much significance to these "high end" ratios. However, it is hard to see how they can be used as evidence for differences in innate ability without suggesting that the gene pool is changing rapidly. The SAT data for recent years is available on the College Board website. (But you'll have a hard time finding it with their search engine. After you've seen what they give you, try something like "SAT College Bound Seniors [year]" on google.)

Before giving a reference to additional data and information, I'd like to quote from a letter I wrote that appeared on page 6 of the Spring, 2004 *CSWP Gazette*. [http://www.aps.org/educ/cswp/gazette/]

> In 1990, Robert Romer, then editor of the *American Journal of Physics*, asked me to respond to a letter which stated "It is not disputed that males outperformed females on tests of mathematical ability." A thorough search of the literature showed that, contrary to what was widely believed and reported, differences were small to non-existent. My findings were reported in *Amer. J. Phys.* **59**(1), January 1991, pp. 11–14. Subsequently, the AAPT included the article in a CD-ROM of resource material for physics teachers. I find it extremely discouraging that, almost 15 years later, unreliable assertions about male math superiority continue to be reported, and often accepted as true, even in places that ought to have higher standards for accuracy.

The *Am. J. Phys.* article is now on the CSWP website under the title "Are there innate cognitive gender differences." [www.aps.org/educ/cswp/women-links.cfm] Unfortunately, the scan quality is not very good.

M.B. Ruskai, marybeth.ruskai@tufts.edu
Research Professor, Department of Mathematics, Tufts University
Emeritus Professor of Mathematics, University of Massachusetts

Call for Nominations: Alice T. Schafer Mathematics Prize

The Executive Committee of the Association for Women in Mathematics calls for nominations for the Alice T. Schafer Mathematics Prize to be awarded to an undergraduate woman for excellence in mathematics. All members of the mathematical community are invited to submit nominations for the Prize. The nominee may be at any level in her undergraduate career, but must be an undergraduate as of October 1, 2004. She must either be a US citizen or have a school address in the US. The sixteenth annual Schafer Prize will be awarded at the Joint Prize Session at the Joint Mathematics Meetings in San Antonio, Texas, January 2006.

The letter of nomination should include, but is not limited to, an evaluation of the nominee on the following criteria: quality of performance in advanced mathematics courses and special programs, demonstration of real interest in mathematics, ability for independent work in mathematics, and performance in mathematical competitions at the local or national level, if any.

With letter of nomination, please include a copy of transcripts and indicate undergraduate level. Any additional supporting materials (e.g., reports from summer work using math, copies of talks given by members of student chapters, recommendation letters from professors, colleagues, etc.) should be enclosed with the nomination. Send *five* complete copies of nominations for this award to: The Alice T. Schafer Award Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. Nominations must be received by **October 1, 2005**. If you have questions, phone 703-934-0163, e-mail awm@math.umd.edu, or visit www.awm-math.org. Nominations via e-mail or fax will not be accepted.

Girls Can Learn Anything That Boys Can... Especially Math and Science

Nancy Oliver Gray

The 100 eighth-grade girls who arrived at Hollins University on the morning of January 20 were likely unaware of the academic firestorm that had been raging nationally over the past several days. Personally, I could not help but appreciate the irony of the girls' reason for visiting our campus in light of a controversy that was focused directly on them.

This enthusiastic group of middle school students had come to Hollins to spend the day taking part in the second annual Sonia Kovalevsky Mathematics Day, an event designed to encourage young women to pursue a study of math and explore the applicability of the subject. The day's activities included the cracking of codes, a mathematics scavenger hunt, and a session where students learned the uses of mathematics in many careers. The event's overall message was simple: Do not fall prey to the stereotypes—girls can enjoy and succeed at math as well as boys can.

But less than a week before, Harvard University President Lawrence Summers seemed to suggest the possibility that innate differences may cause girls to be less successful than boys at mathematics and science, and perhaps socialization did not play as significant a role in this phenomenon as was believed. The backlash was immediate; scholars and pundits from across the country condemned his remarks as "irresponsible" and "damaging." Summers, while insisting his comments were misconstrued, has nevertheless apologized on three separate occasions.

Regardless of whether Summers asserted that girls were inherently less capable at math and science than boys, the controversy has renewed focus on the overall question of why women continue to lag behind men in these fields. To be sure, great strides have been made over the past 30 years and women's participation in math and science has grown significantly. Still, as a report by the U.S. General Accounting Office noted last year, women study science to a much lesser extent than men, even though they now make up the majority of college students. Why is this happening, and is there anything we can do to change the trend?

Increasingly, research shows the reasons appear to have less to do with biological influences and more with social and cultural factors. Furthermore, both the GAO report and a study conducted by University of Oklahoma professor Donna J. Nelson on diversity in science and engineering faculties at research universities make a compelling case for the importance of mentoring both women and girls. Nelson's research shows that women are less likely to enter and remain in these and related fields when they lack mentors, and in particular, female role models. "Many studies have shown that the *mere presence* [emphasis added] of female faculty encourages female students" to study science and engineering, she argues.

At Hollins' celebration of Mathematics Day, those eighth grade girls worked closely with our math professors and majors—all women. Clearly, they came away energized, motivated, and in complete disagreement with the notion that girls cannot do as well in math as boys. As one thirteen-year-old girl who participated put it, "I don't think gender matters. Some people just don't like math."

(At Hollins, these young women were just the first wave. In a couple of weeks, 120 high school girls will come to the university to experience Math and Science Day, where they will participate in mock classes taught by math and science faculty.)

As president of a women's college, I was not surprised to see these girls immerse themselves in word problems, fractals, and mathematical patterns. It exemplifies how women's colleges can play a pivotal role in a young woman's success. The supportive learning environment and leadership focus that these institutions provide help women believe in themselves and prepare them to take on new challenges throughout their lives. Research by the Women's College Coalition has shown that women's college graduates are twice as likely to earn Ph.D.'s and a higher percentage go on to study in the sciences and attend medical school.

Carolyn Turk, the only female mechanical engineer at a company in Maryland, recently published an eloquent essay in *Newsweek* about how you can succeed even if a subject is difficult.

"Here's a secret: math and science don't come easily to most people," she wrote. "No one was ever born knowing calculus. A woman can learn anything a man can, but first she needs to know she can do it, and that takes a leap of faith."

Yes, a leap of faith, combined with events such as Mathematics Day and institutions such as women's colleges that offer unconditional support to girls who want to learn math and science.

Nancy Oliver Gray *is president of Hollins University in Roanoke, founded in 1842 as Virginia's oldest chartered women's college. This article appeared in* The Roanoke Times *on February 2, 2005.*

Summers, Take 2

Anne Leggett

The letter to the editor and the two articles preceding this one show a range of reactions to the remarks of Lawrence Summers, president of Harvard University. The text of these remarks may be found at www. president. harvard.edu/speeches/2005/nber.html. Despite his apologies and his appointment of the task forces on women (described in the March–April issue of this newsletter), Harvard faculty were not appeased. This culminated in a vote of "lack of confidence" by the Faculty of Arts and Sciences on March 17.

The *Boston Globe* contained numerous articles by Marcella Bombardieri. On February 12, "3 university chiefs chide Summers" appeared. It was about the essay "Women and science: the real issue" in the same paper. Written by John Hennessy, Stanford, computer scientist; Susan Hockfield, MIT, neuroscientist; and Shirley M. Tilghman, Princeton, molecular geneticist, it ended with: "Our three campuses, and many others, are home to growing numbers of women who have demonstrated not only extraordinary innate ability, but the kinds of creativity, determination, perceptiveness, and hard work that are prerequisites for success in science and engineering. These figures demonstrate the expanding presence of women in disciplines that have not, historically, been friendly to them. It is a matter of vital concern that the future holds even greater opportunities."

"Summers given a scolding, faculty say" appeared February 16. "Summers releases debated transcript," February 18, quoted David Mumford, Brown University: "[He] said that Summers's mathematical analysis was simply wrong, 'like thinking the earth is flat and measuring geography with straight lines. These are early 20th century models, and people know they are just not adequate to explore the complexities of things like intelligence.' " "Summers vote roils Harvard," March 18, covered the lack of confidence vote referred to earlier, where 218 voted yes, 185 voted no, and 18 abstained. The faculty has no official power over Summers, as he answers only to the Harvard Corporation.

"Summers's teachable moment" by Ellen Goodman appeared in the February 24 *Globe. TIME* and *Newsweek* had cover stories on women and math/science. "Summers of Our Discontent" by Katha Pollitt appeared in the February 21 issue of *The Nation.*

AWM members have appeared in related news. Jean Taylor (Courant Institute) was featured in reaction shots on the PBS News Hour with Jim Lehrer (see the photo at www..pbs.org/newshour/bb/science/jan-june05/Harvard_02-22a.html). Rhonda Hughes (Bryn Mawr) was featured in "Math professor stands up for women" by Kathy Boccella, *Philadelphia Inquirer,* March 1. Alice Silverberg (UC, Irvine) was quoted in "Women and Science: The Debate Goes On" by Rich Monastersky, *The Chronicle of Higher Education,* March 4: "I no longer ask why there are so few women in mathematics; I ask why there are so many. I can think of few male mathematicians who would have stayed in the field if they had faced the prejudice and discrimination female mathematicians deal with." Judy Roitman and Carol Wood have written "Gender and Mathematics. Again" for the May AMS *Notices.* Their byline says it all: "Having received their Ph.D.'s in the 1970s, they have been dealing with this issue for over 30 years and have a hard time believing it's still around."

"Students Protest On Yale Campus: Object To Silence By President Levin" by William Weir appeared in the Hartford Courant on February 18. Graduate students marched to protest the president's "failure to join other university leaders who have denounced remarks made by Harvard

University President Lawrence Summers at a conference last month." The February 20 *New York Times* included the editorial "The Revenge of Ellen Swallow." Finding it impossible to pursue a graduate degree in chemistry at MIT, Swallow invented the field of home economics. "Clueless in Academe" (Stanley Fish, *The Chronicle of Higher Education,* February 23) expressed the viewpoint that Summers's behavior was inappropriate for a university president, asking rhetorically: "Does Harvard want a president who, despite the reputation of being brilliant (where's the beef?) acts as if he were the leader of the Know Nothing Party? Does Harvard want a president who cannot be trusted to go out into the world without a keeper?" "Same Old Stereotyping" (Eugene Robinson, *Washington Post*, February 22) says: "[This imbroglio is] about leadership, and it's about a set of bobs, weaves, dodges and excuses that women and minorities have been hearing, in one form or another, since time immemorial. Summers wrapped it in the language of statistics, invoking standard deviations and such, but it's the same old stuff. No wonder the speech left some in Summers's audience shaking with rage."

"Summers' Remarks Supported by Some Experts" by Matt Crenson, Associated Press Online, February 28, included commentary suggesting that differences between men's and women's brains may lend credence to possibilities raised by Summers.

"Encouragement, not gender, key to success in science" by Janet L. Holmgren and Linda Basch (published in the *San Francisco Chronicle* and in *Carnegie Perspectives* online) suggests that the debate about nature vs. nurture is beside the point: "Surely, shifting from the debate about women's abilities to a constructive discourse about educating women to be leaders in their chosen fields—especially in areas like the sciences and engineering—is long overdue." "Brains of men and women only part of story in science" by Joan Ryan, *San Francisco Chronicle,* March 3, began: "It is one of those controversies that make you wonder how far feminism has really come." The descriptive subtitle to "The Flap/the English experience" by Jeanne Whalen and Sharon Begley in *The Wall Street Journal,* March 30, was: "Improved Formula: In England, Girls Are Closing Gap With Boys in Math; Making Class Interactive Has Side Effect: Females Thrive; Echoes of Harvard Debate—What It Means to Be 'Innate.' "

The AAAS Board approved a statement on women in science and engineering on February 5. It says in part: "AAAS applauds the significant contributions of a large number of women to the advancement of science and to its service to society. Moreover, we wish to make clear that while historically, gender has predicted participation in S&E careers, there is no evidence—nor has there ever been—that it predicts aptitude in science."

In his remarks, Summers made analogies describing demographic groups that are underrepresented in certain areas and referred to the scarcity of Jews in US agriculture. *The Jewish Week* published "Greenberg Acres: Take that, Larry Summers: American Jews are fueling a farming revival" by Steve Lipman on February 25. This story argues that there are many more Jewish farmers in the US than Summers assumes there might be.

Thanks to all the participants in the online AWM discussion group for pointers to articles and interesting commentary on the issues involved. I'll close with some words from Amy Cohen, Rutgers, past AWM treasurer: "The real questions are about the balance between the effects of biology and society on individuals' real opportunities to achieve to the full extent of their desire and potential, and our willingness to establish policies and practices that permit such exercise of our much vaunted liberty."

Michler Grant

AWM recently awarded a Collaborative Research Grant in memory of Ruth Michler to Professor Anna Kaminska of the University of Memphis. The grant will enable her to travel to University Paris VI for one month this summer to continue her collaboration with Professor Yves Raynaud on the geometric structure of Lorentz and Orlicz-Lorentz spaces.

MET II Conference and MER-AWM Session at the JMM

Cathy Kessel

In January, I attended the MET II Summit II Follow-up Conference on behalf of AWM and organized a session at the joint meetings on understanding underrepresentation in mathematics, together with Naomi Fisher and Ginger Warfield. Our outgoing president knew that I would be attending the MET Conference and thought it would be a good idea if I wrote an article about it. I'd mentioned the session on underrepresentation to our incoming president—and she suggested an article on it. This two-part article, with part 2 to appear in the July–August issue, is the result.

The MET Conference

"MET" means "Mathematical Education of Teachers," as in *The Mathematical Education of Teachers Report* jointly published by the American Mathematical Society and the Mathematical Association of America in 2001. The report, often called the MET report, is available at the Conference Board on the Mathematical Sciences (CBMS) website, www.cbmsweb.org.

I helped to edit and produce the MET report, but have not attended any of the associated conferences or workshops and was curious to see what they were like. The Atlanta MET conference was the second organized by the Benjamin Banneker Association and sponsored by the National Association of Mathematicians. Other MET-related events are the MET Summit in November 2001 and the Preparing Mathematicians to Educate Teachers (PMET) workshops run by the MAA (see www.maa.org/pmet). Summaries of many of the 2001 MET Summit talks are on the CBMS website.

The Atlanta conference began with 7:00 breakfast (that's 4:00 to those of us who come from the west coast!). It was followed by a plenary session given by Deborah Ball and Hyman Bass on mathematical knowledge for teaching. (See Ball's web page for overheads from this session.) Ball and Bass gave an outline of how major problems in mathematics education are commonly framed—in terms of poor curriculum, pervasive inequality, and lack of capacity (poor public understanding, teacher shortages, no system for continued growth of teachers' knowledge). Common remedies are to raise teacher salaries, demand more school accountability, create new curricula, and so on.

One aspect of mathematics education is the question of what knowledge teachers need for teaching mathematics. Ball, Bass, and their colleagues are involved in studying this knowledge. For a teacher, knowing the mathematics that students are to learn is not sufficient. In their view, error analysis is one part of what a teacher needs to be doing. Like a physician, a teacher needs to be able to diagnose causes of errors. For example, what might a student have been thinking when writing

$$2 \div \frac{1}{3} = 1\frac{1}{3} \text{ or } 2 \div \frac{2}{3} = \frac{2}{6}?$$

Another aspect of teaching is using and interpreting graphical representations. (I'm using "graphical representations" although I'm not sure that Ball and Bass used this term.) There are different ways to represent $2 \div \frac{2}{3}$, for instance, with hatch marks on a number line, and a teacher needs to understand each of them.

This is a very brief description of Ball and Bass's presentation. I've read much of their work and seen several of their talks, so I had the opportunity to think about their ideas before the conference. I often wonder when hearing their talks if the teaching situations they study affect their characterization of "mathematical knowledge for teaching." (Liping Ma and I have written about how knowledge developed by teaching seems to vary with cultural context in *The Teaching and Learning of Mathematics at University Level.*) Ball and Bass talk about "the work of teaching" (my emphasis) and I wonder about the word "the." I suspect that the knowledge that a teacher needs is dependent on teaching practices and the organization of the mathematics to be taught. James Stigler and James Hiebert's *The Teaching Gap* and Clea Fernandez and Makoto Yoshida's *Lesson Study* describe different teaching practices, and Karen Fuson's work describes an organization and conceptualization of mathematical topics that appears to be different from that of the United States.

In the next session that I attended, Paul Sally described his work with Chicago teachers. Illinois now requires that in-service teachers take courses, and he is among those who teach those courses. He mentioned the question "When does multiplication stop being repeated addition?" and a

textbook's assertion "remember that multiplication is repeated addition." He gave an example of a task that might occur in middle school: draw a square with side length 1 and draw a circle around the square. What is the circumference of the circle? And—for a teacher or textbook author—what's the repeated addition in that circumference calculation?

Sally also mentioned that Alan Greenspan has emphasized the importance of elementary mathematics education. He didn't have a source, but a later Google search on "Alan Greenspan mathematics education" yielded a number of hits, including: 1) "The economic importance of improving math-science education," Testimony of Chairman Alan Greenspan Before the Committee on Education and the Workforce, U.S. House of Representatives, September 21, 2000, www.federal reserve.gov/BoardDocs/Testimony/2000/20000921.htm and 2) "Greenspan: Schools Should Focus on Math," *Houston Chronicle,* February 5, 2002, mec-math.org/libraries/detail.asp?RecordID=54. The latter begins, "Schools need to do better at teaching basic mathematics to reduce an alarming lack of knowledge about fundamental financial concepts, Federal Reserve Chairman Alan Greenspan said."

At lunch we heard a talk from statistician Ann Watkins. She gave examples of the importance of involving statisticians in teacher preparation and other aspects of precollege education, including the creation of state standards. Statistical terms and concepts have been misused in state standards and associated state tests, both in the wording of questions and in the categorization of test questions. Watkins gave examples that would have been funny—except that they were real.

Not all is gloom in the statistics education world. There do not seem to be "statistics wars" (unlike those in mathematics, which I hope are past history) and AP statistics teachers are endeavoring to rise to the challenge of teaching courses

Sonia Kovalevsky High School Mathematics Days

Through a grant (*pending final funding approval*) from Elizabeth City State University and the National Security Agency (NSA), the Association for Women in Mathematics expects to 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.

AWM anticipates awarding 12 to 20 grants ranging on average from $1500 to $2200 each ($3000 maximum) to universities and colleges; more grants may be awarded if additional funds become available. 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 breakdown of 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 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. The 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 August. The high school days are to be held in Fall 2005 and Spring 2006. If selected, the organizer(s) must submit a report of the event along with receipts (originals or copies) for reimbursement to AWM within 30 days of the event date or by May 15, 2006, whichever comes first. Reimbursements will be made in one disbursement; no funds can be disbursed prior to the event date. An additional selection cycle will be held February 4, 2006 for Spring 2006 *only if* funds remain after the August 2005 selection cycle.

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@math.umd.edu, or visit www.awm-math.org. Applications must be received by August 4, 2005; applications via e-mail or fax will not be accepted.

for which they haven't been entirely prepared. Watkins said that on a statistics education listserve, teachers were willing to ask questions that revealed gaps in their knowledge and statisticians were willing to answer them. (The attitude of these teachers and statisticians is cheering, but the dismal empiricist in me wonders if questions and answers on a listserve suffice.)

In one of the afternoon sessions, Robert Berry described his findings. He had followed eight African American middle school boys as they changed grades and were placed in various mathematics courses. Such placement decisions are usually made on the basis of grades, scores on standardized tests, and teacher recommendations. The students that Berry followed qualified for pre-algebra on the basis of grades and scores, but not on the basis of teacher recommendations. Why? They were too "antsy" and their teachers thought they wouldn't sit still for pre-algebra, even that two had Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADHD).

But their parents thought they needed more challenging classes. The two students that teachers thought might have ADD or ADHD did not receive this diagnosis from a psychologist—although one of the eight was diagnosed as having ADHD. Fortunately for these students, their parents were able to get their course placements changed. Some of the MET session participants remarked on how critical this was—in many schools it seems that once a child is derailed from the college track his or her route to college lengthens or vanishes. (See also Question 1 of the EQUALS program's Startling Statements: www.lawrencehallofscience.org/equals/ browse/pdf/ SS2004.pdf. "In 2001, approximately 12% of all children were assigned to special education programs. What percent of African-American boys were assigned?")

Berry's findings reminded me of how much of children's educational experiences depend on their parents' advocacy, monitoring by school principals and superintendents, and teachers themselves. I was also reminded that a teacher's knowledge and preparation affects decisions made outside as well as inside the classroom. (This may be particularly important in the U.S. educational system, where frequent sorting occurs in the form of assignments to different classes and programs. For example, in elementary school there are "pull-out programs" in which "academically gifted" students are pulled out of regular classes to receive special instruction. In later grades, students may be assigned to pre-algebra, thus putting them on a college track.)

The afternoon sessions were followed by a plenary from Jim Lewis (chair of the MET steering committee) and Glenda Lappan (a past president of the National Council of Teachers of Mathematics, currently co-director of the Center for the Study of Mathematics Curriculum). Lewis focused on teacher preparation and described the courses for teachers at the University of Nebraska where he teaches. Lappan focused on the education of teachers after they graduate from college, noting that the mathematics education of teachers is (or should be) life long.

After dinner we heard a talk by Richard Schaar. It just happened to be the day after his retirement from Texas Instruments. Not surprisingly, his talk focused on the need for mathematically able workers. The meeting ended with Banneker executive director Irvin Vance's announcement that Texas Instruments would be funding "teaching with technology" grants to be administered by the Benjamin Banneker Association. (The deadline for this year's proposals, April 20, has already passed.)

— to be continued —

Education Column

Note from the Education Editor: In the course of the past month I have moved out of the house I lived in for 31 years and across town. As a result, my copy of Case and Leggett's *Complexities,* complete with Post-It notes marking the women I want to include in the non-standard career column, is buried at the bottom of a box, and my set of ideas, complete with mental Post-It notes marking the ones that seemed interesting enough for a column, is buried at the bottom of my brain. Neither can be retrieved in time for this issue, but I fondly hope to retrieve them before the next. My apologies!

Career Options and Negotiating Skills

Seema Nanda, Harvey Mudd College; Kathy Brenan, Aerospace Corporation; and Suzanne Lenhart, University of Tennessee

The Career Options for Women in Mathematical Sciences Workshop held at the Institute for Mathematics, February 4–5, 2005, was co-organized by the IMA and the Association for Women in Mathematics and co-sponsored by the Ford Motor Company.

The stated goal of the workshop was to familiarize women in the early stages of their mathematical career (graduate students and recent Ph.D.'s) with professional opportunities in industry and government labs and to suggest strategies not just to survive but to thrive as working mathematicians. Accordingly the participants chosen were young mathematicians at various institutes across the country who were interested in exploring career options.

A special session, "Negotiating Skills," preceded the workshop. This morning program was led by Dr. Barbara Butterfield of Humaned and Dr. Jane W. Tucker, Senior Manager of IT at Duke University. Financial support for this session was obtained from Ford Research Laboratory, an example of successful negotiation by Dr. Erica Zimmer Klampf.

Butterfield and Tucker discussed the key principles of negotiation, noting that it is critical to know what you are trying to achieve versus what you are willing to give up. Preparation prior to negotiations include collecting as much data as you can (i.e., "do your homework") and determining your "BATNA" (your best alternative to a negotiated agreement). For example, in the case of academic positions, prepare by researching comparable salary ranges in the annual survey published in the AMS *Notices.* In industry, salary data across a comparable set of industries may be found at company and employment websites.

The focus of the session was primarily on negotiations in academic situations, such as pursuing a tenure track position at a university, negotiating for a promotion, and even negotiating the balance between teaching and service. The leaders discussed a full range of items that may be negotiated for in a job offer, including title, tenure status, teaching and committee duties, travel budget, office space and computational facilities, etc.

Again, it was recommended that you should keep in mind what is most important to you, and what is reasonable in the situation to negotiate. Simply stated, you need to consider the circumstances and what the best outcome is for you and the employer. It was highly recommended not to rely on e-mail to clinch a job offer, and while e-mail can be used during the negotiating process, ultimately the details need to be put in a traditional formal job offer letter. Also, face-to-face negotiations are much more powerful and harder to dismiss.

Every day we are negotiating in some aspect of our daily lives, whether it is at work or at home. These negotiating techniques may be applied as well to negotiating positions and promotions in industry, and even to negotiating with our children and partners.

Understanding your personal style of negotiating was also deemed important to the end result. Participants took the Thomas-Kilmann Conflict Mode test in order to evaluate how they typically respond when confronted with a conflict. Specifically, this test scores an individual in terms of five modes of conflict resolution: competing, collaborating, compromising, avoiding, and accommodating. We learned that as there will be situations where each style is useful during the negotiation process, it is most important to recognize our own styles and to assess what mode is most likely to promote our cause in a particular negotiation. Simply being aware of these different styles and their effectiveness in different situations was very enlightening.

The leaders discussed specific tactics and counter tactics that can be employed during the negotiating process. For example, sometimes "silence is golden," but other times when you need time to collect more data, you might want to delay giving an answer to a question by asking another great question. Also, keep in mind that it can be useful to concede a small item when you have succeeded in negotiating a large item (all in the spirit of positive negotiations!).

This session included working together in small groups to analyze the negotiating styles for three academic case studies: competitive job offers, teaching load vs. committee service, and research facilities. Later each group developed a new case study pertinent to their group and discussed negotiating tactics to facilitate the best outcome. This morning session

spurred on the interaction between the participants of the IMA/AWM workshop that began after lunch.

In conclusion, the negotiating skills session was highly useful not only for graduate students who will be confronting their first job search but also for seasoned career professionals who want to advance to tenure or progress up the corporate ladder. For more information on the negotiating skills session, Butterfield and Tucker may be contacted at bbutter@mich.edu and janetucker@duke.edu respectively.

The rest of the workshop included talks by working mathematicians, a panel discussion and small group interactions. The speakers were divided equally between private industry and federally funded organizations, with Margaret Cheney (Rensselaer Polytechnic Institute) as the sole tenured faculty presenter. We mention a few of the topics covered by the speakers (more detail may be found at the IMA website www.ima.umn.edu/cwims).

Presenters spoke at length about the nature of their jobs and the mathematical knowledge that they were likely to use. They were very willing to describe projects that they worked on. Miriam Lucian (Boeing) gave a charming account of her longstanding career as a research scientist. One could sense that she enjoyed her work and colleagues there. Miriam started her mathematical career in academia as a logician, a far cry from applied mathematics. Her evolution into an applied mathematician made for an interesting story.

Brenda Dietrich (who has spent 20 years at IBM) manages about 95 full-time employees, 80% of whom have a Ph.D. She talked about IBM's legacy transformation services, her current view on IT applications, and the importance of mathematics in new initiatives involving business optimization models. She looked rather comfortable as she worked on her knitting after her talk.

Diane Woodward of Société Général (a French investment bank) gave a sampling of the sophisticated mathematics used in risk management in the finance industry and discussed her path of transition from academia to industry. The finance industry offers a viable (and monetarily very rewarding) career option for mathematicians who may be interested.

Erica Zimmer Klampf from Ford Motor Company was influential in getting funding from her company to enable this meeting. In her presentation, she discussed in some detail her decision process in choosing industry over academia as a career choice, at the time she finished her Ph.D. Her clarity in stating her priorities in life and in explaining how to use those priorities to make decisions was quite valuable for the younger mathematicians. In discussing her work at Ford she also compared academic and industry jobs.

Margaret Cheney gave a very informative presentation about the road to tenure. She enumerated the relevant steps towards that goal. She repeatedly emphasized the importance of having a well-defined and focused area of research until tenure is obtained. (This view was reiterated by Suzanne Lenhart during a panel discussion.) Margaret discussed the importance of confidence and the relevance of presenting the right image for females in the field, so as to be taken seriously by colleagues. The importance of mentors, of collaborating with others, of attending talks in other fields and of really knowing the "big" problems in one's area of research were other points she emphasized. For academic mathematicians, obtaining tenure is like taking the road to Mecca, and it appears more so for women.

Laura Frink from Sandia National Laboratories works on interdisciplinary research on complex fluids. Due to a move necessitated by her family situation, she is just starting to telecommute to work for Sandia.

The first evening ended with a poster presentation session showing research done by several of the younger participants. This session was held concurrently with a wine and cheese reception. The day ended with an organized dinner where at least one senior mathematician from each of academia and industry was assigned to each table. The discussions about careers carried on over dinner, which was a fairly relaxed setting.

The atmosphere at the workshop was one of camaraderie among the participants in general, making it a good networking opportunity for the younger mathematicians. The senior mathematicians were willing to play mentoring roles and spoke openly of their opinions and experiences. The two-body problem (and how to get around it) was discussed several times during these two days. The problem is alive and well, and negotiating for a job with (or for) a spouse or partner simultaneously adds greatly to the complexity of the negotations. It was suggested that letting a potential employer know about your two-body issue ahead of time is a better strategy than keeping them in the dark.

The second afternoon started with a panel discussion where five mathematicians (Pam Bimms, Kathryn Brenan, Yi-Ju Chao, Suzanne Lenhart, and Janet Pavelich)

discussed their personal stories and shared advice for future generations of mathematicians. The younger women sought support, and the senior women were generous with their time and effort. There were stories shared of interviews gone awry and disappointments as well as of successes achieved.

The panel discussion was followed by working groups of participants. These groups worked on answering questions related to issues from the workshop. After dinner together, the movie "To Dream Tomorrow" about Ada Bryon Lovelace was a fitting finale.

We would like to thank Natalia Alexandroz (NASA Langley Research Center), Kathryn E. Brenan (Aerospace Corp), L. Pamela Cook (University of Delaware), Erica Zimmer Klampf (Ford Motor Company), Kristin Lauter (Microsoft), Suzanne Lenhart (University of Tennessee) and Debra Lewis (University of Minnesota) for leading the organization of this workshop. We would also like to thank Doug Arnold, Director of the IMA, for his initiative and efforts in making this event happen.

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.

Book Review

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Complexities: Women in Mathematics, Bettye Anne Case and Anne M. Leggett, Editors, Princeton University Press, Princeton, 2005. ISBN 0-691-11462-5, xix+413 pp.

Reviewer: Margaret Bayer, University of Kansas

The literature on women in mathematics is broad. It includes the history of women's participation in mathematics, biography of women mathematicians, statistical studies of the status of women in mathematics, analysis of discrimination and factors contributing to the exclusion of girls and women from mathematics, exposition of problems shared by women in mathematics, descriptions of programs to overcome these problems, feminist and other philosophical or sociological theories of women's role in mathematics, and even the mathematics done by women. So where does a young woman interested in a career in mathematics, or anyone who wishes to learn about the issues, start? Our own Bettye Anne Case and Anne Leggett have provided the answer.

This volume serves as an introduction to many of the topics listed above. It consists of about 80 essays, most of them by current, active women mathematicians. Many of the essays previously appeared in the AWM *Newsletter*,

generally updated or otherwise edited for inclusion here. Some are new for this volume. The collection gives the new reader a sense of where we have come from, and what are our shared experiences. It gives the old-timers a chance to review our struggles from our current perspective and to compare our experiences and current situations with those of others.

How might we interpret the title, "Complexities"? For me it refers to the attitudes of others—family, colleagues, students—towards women mathematicians; to the strategies we have used to increase and improve women's participation in mathematics; to the trajectory of progress we have experienced; and to the decisions each woman must make in pursuing her career in mathematics and her personal life.

Part I of the book, Inspiration, presents short biographical essays on past women mathematicians from the nineteenth and twentieth centuries. Part II, Joining Together, gives some of the history of the AWM and of other organizations' efforts to advance the status of women in mathematics. The remainder of the book, divided into Part III: Choices and Challenges, Part IV: Celebration, and Part V: Into a New Century, tells the stories of modern women mathematicians along with the context in which we work. In the center is a photo album, making the stories of the book that much more personal.

The essay "Pathways in Mathematics" by the editors looks at the educational and career paths of women mathematicians in the US today. It also gives an overview of data on the participation of women in mathematics. "Demographic Trends and Challenges," by Carolyn Mahoney, looks particularly at gaps in educational attainment for people of different racial and ethnic groups, and the participation levels of people with disabilities. A number of essays discuss mathematics itself. Part IV, Celebration, includes papers from the Olga Taussky Todd Celebration of Careers for Women in Mathematics. These are mostly expository talks in mathematics related to Taussky Todd's work.

The essay on "AWM in the 1990s" by Jean Taylor and Sylvia Wiegand (based on articles in the AMS *Notices* and in the AWM *Newsletter* in 1999) includes a section entitled "Why AWM is still needed." We see that the progress of women in mathematics is very uneven, and that it can often be described as "two steps forward, one step back." Different disciplines within mathematics have different cultures. Often the tone is set by a small number of senior (or younger, "hot-shot") researchers. The same is true for departments in different universities. Of great concern is the paucity of women at the top-ranked mathematics departments. Also discouraging is the decrease in numbers of women at certain departments. (I taught at Northeastern University in the mid-80s, when there were eleven women on the math faculty there. Now there are three.) But on the bright side, women as mathematicians stand out much less than we used to. Men are often uncomfortable hiring, and then interacting with, the first and second women in a department; the fourth and fifth women are just colleagues. More and more new Ph.D.'s do not have to be the oddity in their departments.

The majority of essays in the book speak of the experience of individual mathematicians in the mid- to late twentieth century. The great majority of women report families supportive of their educational aspirations. The African-American women, in particular, describe a culture that assumed women would have to support themselves and saw education as the means to "escape the extremely low-paying jobs designated for Black women." [Vivienne Malone Mayes] Many women had parents and siblings who loved mathematics. Carolyn Gordon says that her sister's love of mathematics "helped me feel that it was okay for girls to enjoy mathematics in spite of all the teasing at school." But not all families went so far as to support a Ph.D. in mathematics and the subsequent career. Nancy Kopell entered graduate school "with much apprehension aimed my way by my parents who had in mind for me a more traditional homemaker role."

Few women get as far as graduate school in mathematics without significant encouragement from a professor or professional mathematician. Thirty years ago this was unlikely to come from a woman, simply because we were unlikely to have met any women mathematicians. The women who fell under the wing of Olga Taussky-Todd or Evelyn Boyd Granville were lucky indeed. But many men provided the encouragement needed to propel women to graduate school. "When I was taking Calculus I at Bellarmine College, my professor, Ralph Grimaldi, started to encourage me to prepare for studying mathematics in graduate school." [Suzanne Lenhart] An exchange with women mathematicians on a career panel for high school students went like this: "Did they think it was possible for

me to major in math in college? Their response was 'Absolutely!' " [Helen Moore]

Unfortunately, few women of my generation got as far as graduate school in mathematics without significant discouragement from a professor. "He warned me that the failure rate on the examinations was about 50% in general and about 98% among 'housewives like you.' " [Elayne Arrington-Idowu] And, sadly, more recent Ph.D. graduates also tell disheartening stories. "My math advisor never suggested graduate school and steered me toward education courses despite my interest in pure math." [Karen Smith] "There were numerous incidents in which women in our graduate program experienced harassment." [Helen Moore] Such blatant discrimination is not so common today. But perhaps even greater determination is needed to overcome the more subtle forms of discrimination. It is easy to internalize criticism and blame oneself when the prejudice is not so explicit.

I have sometimes observed that sexist attitudes often come in a package with other prejudices. Dorothy Bernstein reports that Professor Tamarkin at Brown "admitted that my exam was extra long for two reasons: one, I was a woman, and two, I had taken most of my courses at a midwestern university." I recalled my own similar experience when I read the account by Catherine Roberts: "It was suggested to me by the chair of one graduate program that I wasn't perceived as 'serious,' since I'd spent a semester abroad in an art program." And, of course, the greatest "double dose of discrimination" has been experienced by our African-American colleagues. In their moving essays in this book, they portray an "extraordinary determination to succeed" in the face of extreme and unabashed discrimination.

The essays in this book are written by women who persisted in spite of discouragement and, sometimes, harassment. What were their personal strategies for overcoming the obstacles? Peer support was crucial to many. "Most of my classes had two women in them. She and I became very good friends." [Vivienne Malone Mayes] As few other women persisted in her graduate program, Helen Moore turned to a women in science group for support. Almost all women describe an important (usually male) mentor in graduate school or post-doctoral years. Several writers in this book give direct advice to the reader. Audrey Terras lists her "five simple rules for academic success (or at least survival)." Essays in the section "Having a Life" validate the decisions we make to balance our work with our life. Karen Smith tries to counteract "The Worst Advice I Ever Got." "Increasing Minority Representation in Mathematics," by William C. Hawkins, et al., gives recommendations for departments based on *Survey of Minority Graduate Students in U.S. Mathematical Sciences Departments* (1997; MAA and NAM, with the assistance of the AMS). Barbara Brown Flynn, who works at NSA, suggests what individuals can do to be a positive force in the workplace.

Most of all, the writers give us their examples. We hope that all women students now can find role models around them. But we can always use more—and this book provides many. My recommendation to you: Buy the book. Read it. Lend it to your colleagues and students. Discuss it with them.

AWIS Conference

AWIS will hold a national conference on Women in Science and Engineering, June 23–24, 2005, Smith College, Northampton, MA. The objectives are to: assess the progress made on the seven recommendations from the 1995 NSF Conference on Women in Science; present and discuss current data on the status of women in science and engineering; select the most important remaining barriers to the success of women in STEM careers; and make recommendations for a research agenda for the next decade. Topics will be useful for corporate managers and academic administrators, STEM researchers, faculty, graduate students, and those interested in helping women scientists and engineers achieve full potential in their careers. Speakers will include Dr. Shirley Ann Jackson, President of Rensselaer Polytechnic Institute, and Dr. Rita Colwell, former Director of the National Science Foundation. The president of Smith College, Carol Christ, will make welcoming remarks.

Visit www.awis.org/2005ncregistrationform.html to register. Fees are $150 for AWIS members, $195 for nonmembers, and $125 for students/postdocs.

The seven recommendations of the 1995 NSF conference are available at www.awis.org/awis1995.html.

Olga Ladyzhenskaya and Olga Oleinik:
Two Great Women Mathematicians of the 20th Century

Susan Friedlander, University of Illinois-Chicago, and Barbara Lee Keyfitz, Fields Institute and University of Houston

This short article celebrates the contributions of women to partial differential equations and their applications. Although many women have made important contributions to this field, we have seen the recent deaths of two of the brightest stars—Olga Ladyzhenskaya and Olga Oleinik—and in their memory we focus on their work and their lives.

The two Olgas had much in common and were also very different. Both were born in the 1920s in the Soviet Union, grew up during very difficult years and survived the awful death and destruction of the second world war. Shortly after the war they were students together at Moscow State University where they were both advised by I. G. Petrovsky, whose influence on Moscow mathematics at the time was unsurpassed. Both were much influenced by the famous seminar of I. M. Gelfand, and both young women received challenging problems in PDE from Gelfand. In 1947 both Olgas graduated from Moscow State University, and then their paths diverged. Olga Oleinik remained in Moscow and continued to be supervised by Petrovsky. Her whole career was based in Moscow; after receiving her Ph.D. in 1954 she became first a professor and ultimately the head of the Department of Differential Equations at Moscow State University. Olga Ladyzhenskaya moved in 1947 to Leningrad, and her career developed at the Steklov Institute there. Like Oleinik, her mathematical achievements were very influential; as a result of her work Ladyzhenskaya overcame discrimination to become the uncontested leader of the Leningrad school of PDE.

It is our understanding that the personalities of the two Olgas were rather different, although they were both women of great strength and determination. Oleinik was a member of the academic establishment with all that this implied in the Soviet system, while Ladyzhenskaya, whose father was arrested and killed as a "class enemy," was outside the establishment and at times openly critical of the system. However, in both cases their superb mathematics well merited the ultimate seal of approval of the establishment, namely election to membership in the Russian Academy of Sciences.

Olga Ladyzhenskaya

Olga Alexandrovna Ladyzhenskaya was born on March 7, 1922 in the rural Russian town of Kologriv and died in her sleep on January 12, 2004 in St. Petersburg, Russia, at the age of 81. She left a wonderful legacy for mathematics in terms of her fundamental results connected with partial differential equations and her school of students, collaborators and colleagues in Russia. In a life dedicated to mathematics she overcame personal tragedy arising from the cataclysmic events of 20th century Russia to become one of that country's leading mathematicians.

In 1939 she passed the entrance exams for Leningrad University, which at the time was the best university in the Soviet Union. However, she was denied a place as an undergraduate at the university because despite being an exceptionally gifted young woman, she was one whose father disappeared in Stalin's gulag. Her father had taught mathematics at a high school, and it was her father who introduced Olga at an early age to mathematics and calculus. In 1937 her father was arrested and later killed by the NKVD, the forerunner of the KGB. Life then became extremely difficult for his family who lived in disgrace and poverty as the family of a class enemy. With help from friends Olga finally became a student at Moscow State University in 1943, and she graduated in 1947. There I. G. Petrovsky was her advisor, and she was also strongly influenced by I. M. Gelfand.

Olga married Leningrad mathematician A. A. Kiselev in 1947 and became a graduate student at Leningrad State University. Her advisors were S. L. Sobolev and V. I. Smirnov. Her Ph.D. thesis, defended in 1949, was a breakthrough in the theory of PDE, and later developments concerning weak solutions to initial boundary value problems became important concepts in mathematical physics. From 1947 on she was very actively involved in the Leningrad seminar on mathematical physics that brought together many mathematicians working in PDE and their applications. She remained one of the leaders of the seminar until her death.

For most of her professional career Olga was a member of the Steklov Institute in Leningrad/St Petersburg (called LOMI and now called POMI). She rose to become one of

the most distinguished and influential members of POMI. She was elected to the Russian National Academy of Sciences (as corresponding member in 1981 and as full member in 1990). Among her prizes was the Kovaleskaya Prize of the Russian Academy. Her mathematical achievements were honored in many countries. She was a foreign member of several academies including the Leopoldina, the oldest German academy. Among other offices, she was President of the Mathematical Society of St. Petersburg and as such a successor of Euler. Recently she was awarded the degree of Doctor Honoris Causa by the University of Bonn, and an excellent description of her achievements may be found in the *laudatio* given for this occasion by M. Struwe [1].

Olga Ladyzhenskaya

Ladyzhenskaya made deep and important contributions to the whole spectrum of partial differential equations and worked on topics that ranged from uniqueness of solutions of PDE to convergence of Fourier series and finite difference approximation of solutions. She used functional analytic techniques to treat nonlinear problems using Leray-Schauder degree theory and pioneered the theory of attractors for dissipative equations. Developing ideas of De Giorgi and Nash, Ladyzhenskaya and her coauthors gave the complete answer to Hilbert's 19th problem concerning the dependence of the regularity of the solution on the regularity of the data for a large class of second order elliptic and para-bolic PDE. She published more than 250 articles and authored or co-authored seven monographs and textbooks. Her very influential book *The Mathematical Theory of Viscous Incompressible Flow,* published in 1961, has become a classic in the field. Her main mathematical love was the PDE of fluid dynamics, particularly the Navier-Stokes equation. This equation has a long and glorious history but remains extremely challenging: for example, the issue of existence of physically reasonable solutions to the Navier-Stokes equations in three dimensions was chosen as one of the seven "million dollar" prize problems of the new millennium by the Clay Mathematical Institute (for details, see the problem description by Fefferman [2]). The three-dimensional problem remains open to this day, although it was in the 1950s that Ladyzhenskaya obtained the key result of global unique solvability of the initial boundary problem for the two-dimensional Navier-Stokes equation. She continued to obtain influential results and raise stimulating issues in fluid dynamics, even up to the days before her death. Ladyzhenskaya also considered fluid dynamics outside the framework of the Navier-Stokes equations. She explored alternative models for such challenging issues as turbulence, and this led her to study the notion of an attractor for infinite dimensional dynamical systems. In this connection she opened a new direction in the theory of PDE, namely "stability in the large." Further details concerning Ladyzhenskaya's significant mathematical achievements may be found in the memorial article in the *Notices of the AMS* [3] and in the volumes published in honor of her 80th birthday [4].

Olga was a woman of great charm and beauty. She was part of a circle of Russian intellectuals of world-wide fame including A. Solzhenitsyn, A. Akhmatova and J. Brodsky. G. Seregin and N. Uraltseva, her friends, colleagues and collaborators, tell us that it was not only Olga's scientific results, though truly deep and fundamental, but also her personal integrity and energy that played a special role in her contribution to mathematics.

Selected Honors and Publications of Olga Ladyzhenskaya

1969	The State Prize of the USSR
1985	Elected a foreign member of the Deustche Akademie Leopoldina
1989	Elected a member of the Accdemia Nazionale dei Lincei

Olga Ladyzhenskaya (with Tamara Rozhkovskaya in mirror)

1990 Elected a full member of the Russian Academy of Sciences

2002 Awarded the Great Gold Lomonosov Medal of the Russian Academy

2002 Doctoris Honoris Causa, University of Bonn

with N. Uraltseva, *Linear and Quasilinear Elliptic Equations,* Nauka, Moscow 1964 ; Engl. trans., Academic Press, New York 1968.

The Mathematical Theory of Viscous Fluids, Fizmatgiz, 1961; Engl. trans., Gordon and Breach, New York 1969.

with A. Kiselev, "On the existence and uniqueness of the solution to the non-stationary problem for a viscous incompressible fluid," *Izv. Akad. Nauk SSSR Ser Mat 21,* 665–680, 1957.

"Solution in the large of boundary value problems for the Navier-Stokes equations in 2 space variables," *Comm Pure Appl Math 12,* 427–433, 1959.

with V. Solinnikov and N. Uraltseva, *Linear and Quasilinear Equations of Parabolic Type,* Nauka, Moscow 1967; Engl. trans., *Transl. Math Monographs,* 23, AMS, 1968.

Attractors for Semigroups and Evolution Equations, Lezioni Lincei, Cambridge Univ Press, 1991.

Olga Oleinik

Olga Arsenievna Oleinik was born in the Ukraine on July 2, 1925 and died of cancer on October 13, 2001.

She obtained her Ph.D. from Moscow State University (where she spent her career) in 1954, a student of Ivan Petrovsky, one of the founders of the modern theory of partial differential equations (PDE). As Petrovsky's successor, she built a strong team in PDE, and from the start of her career she also explored applications in elasticity and in several aspects of fluid flow, including compressible gas dynamics and the filtration equation of flow in porous media.

Near the beginning of her career, she contributed greatly to the theory of hyperbolic conservation laws, then in its infancy. Conservation laws are nonlinear partial differential equations of the form

$$u_t + f(u)_x = 0. \quad (1)$$

Here u is a scalar or vector quantity, and f a corresponding flux function. Equation (1) expresses conservation of the components of u — typically mass, momentum and energy. The system is hyperbolic when the Jacobian of the flux, df, has a full set of real eigenvalues and eigenvectors. When $f(u) = Au$ for a matrix A, the system is linear and its solutions, including weak solutions, are well understood from linear theory.

The wartime work of Courant, Friedrichs and others had established the necessity of finding a nonlinear theory for weak solutions, as classical hyperbolic theory could not explain the spontaneous formation of shocks, the fact that nonlinear equations gave rise to discontinuities that did not propagate along characteristics, or the ensuing questions about lack of uniqueness. In addition, global existence theorems were lacking, and even the correct function spaces in which to seek solutions were unknown, despite the fact that these equations underlay the technology of explosions and the new field of supersonic flight. The work of Oleinik changed this. She proved existence of weak solutions to the scalar equation (1), for general flux functions, showing they were limits of the perturbed equation

$$u_t + f(u)_x = \varepsilon u_{xx} \quad (2)$$

generalizing work of Hopf. It would be almost 50 years until this result was broadened to systems of conservation laws. In her investigation, Oleinik found the correct space—*BV*—for solutions. She also developed what is now called the Oleinik entropy condition for uniqueness of solutions of the scalar equation (1). Finally, she proved a uniqueness result for solutions of certain systems, modelled on gas dynamics—this at a time when no existence theorems for systems had yet been proved; the first existence theorem for systems, due to Glimm, appeared shortly after her result. Again, the uniqueness result was not improved for over 30 years.

Olga Oleinik

Oleinik developed fundamental mathematical results in other areas related to classical fluid flow: boundary layer theory (the stability of boundary layers, where viscosity is important only close to the body) and degenerate elliptic equations (motivated by change of type in steady transonic flow). In this last field, termed "equations with non negative characteristic form," she completed and extended work of the Italian school, notably Fichera and Tricomi.

Later in her career, Oleinik turned her attention to diverse other areas: the Stefan problem, in which the mathematical interest is that it provides a free boundary problem for a parabolic equation and the applications interest is in phase transitions. She also provided the basic theory of weak solutions for the nonlinear degenerate parabolic equation known as the filtration equation. In the 1990s, Oleinik, with Jikov and Kozlov, helped to develop the mathematical theory of homogenization.

In all, her list of publications indexed by *Math Reviews* includes over 400 items, displaying an astonishing breadth and depth. A memorial article in the *Notices* remarks on her love of travel, her eagerness to make contacts between Soviet and Western mathematicians, and her loyalty to her friends.

Selected Honors and Publications of Olga Oleinik

1981	Honorary Doctorate, University of Rome
1983	Elected an Honorary Member of the Royal Society of Edinburgh
1988	Elected a member of the Academia Nazionale dei Lincei
1990	Elected a full member of the Russian Academy of Sciences
1996	Association for Women in Mathematics Noether Lecturer

She was also awarded the Petrovsky Prize and the Medal of the Collège de France.

"Discontinuous solutions of non-linear differential equations," *Uspehi Mat. Nauk* (N.S.) 12 (1957), no. 3(75), 3–73.

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Cora Sadosky and Olga Oleinik after Oleinik's Noether Lecture

Photo credits

Thanks to Tamara Rozhkovskaya (Novosibirsk) and Sandra Frost (AMS) for all their help in obtaining electronic files of the first three photos. See www.mathsoc.spb.ru/pantheon/ladyzhen/pic.html for a photo album of Ladyzhenskaya.

p. 21: Reproduced with permission from *Nonlinear Problems in Mathematical Physics and Related Topics. In Honor of Professor O. A. Ladyzhenskaya I, II,* M. Sh. Birman, S. Hildebrandt, V. A. Solonnikov, N. N. Ural'tseva, eds., o f the International Mathematical Series published by Kluwer/Plenum Publishers (English; now Springer) and by Tamara Rozhkovskaya (publisher, Russian).

p. 22: Tamara Rozhkovskaya

p. 23: From the collection of E. Radkevich

p. 24: Dawn Wheeler, AWM

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

Over the past sixteen 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 AWM Workshop to be held in conjunction with the Joint Mathematics Meetings will take place in San Antonio, TX, January 12–15, 2006 (Thursday–Sunday). The workshop is scheduled to be held on Sunday, January 15 with an introductory dinner/discussion group on Saturday evening, January 14.

FORMAT: Twenty women will be selected in advance of the workshop to present their work; the graduate students will present posters and the recent Ph.D.'s will give 20-minute talks. AWM will offer funding for travel and two days subsistence for the selected participants. The workshop will also include a panel discussion on areas of career development, a luncheon and a dinner with a discussion period. Participants will have the opportunity to meet with other women mathematicians at all stages of their careers. All mathematicians (female and male) are invited to attend the program. Departments are urged to help graduate students and recent Ph.D.'s who do not receive funding to obtain some institutional support to attend the workshop presentations and the associated meetings.

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

ELIGIBILITY: Applications are welcome from graduate students who have made substantial progress towards their theses and from women who have received their Ph.D.'s within approximately the last five years, whether or not they currently hold a postdoctoral or other academic position. Women with grants or other sources of support are welcome to apply. All non-US citizens must have a current US address. All applications should include a cover letter, a concise description of research (two or three pages), a title of the proposed poster or talk, a curriculum vitae, and at least one letter of recommendation from a faculty member or research mathematician who knows the applicant's work. In particular, a graduate student should include a letter of recommendation from her thesis advisor. Nominations by other mathematicians (along with the information listed above) are also welcome. For some advice on the application process from some of the conference organizers, see the AWM website.

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

Workshop Selection Committee
Association for Women in Mathematics
11240 Waples Mill Road
Suite 200
Fairfax, VA 22030

Phone: 703-934-0163
E-mail: awm@math.umd.edu URL: www.awm-math.org

APPLICATION DEADLINE

Applications must be received by **September 1, 2005**. Applications via e-mail or fax will not be accepted.

Honors and Awards

AAAS Lifetime Mentor Award

press release

A Bryn Mawr College professor in Pennsylvania and an energetic North Carolina-based engineer this week earned top honors from AAAS, the world's largest general scientific organization, for their tireless efforts to help underrepresented students earn doctoral degrees in the sciences.

Rhonda J. Hughes, the Helen Herrmann Professor of Mathematics at Bryn Mawr College, was named by AAAS, the American Association for the Advancement of Science, to receive the prestigious 2004 AAAS Lifetime Mentor Award. Hughes has helped 57 women and minority students earn graduate degrees in mathematics, including 17 at the doctoral level.

Jagannathan Sankar, professor of mechanical and chemical engineering and the director of the Center for Advanced Materials and Smart Structures (CAMSS) and the Center for Nanoscience and Nanomaterials at North Carolina A&T State University, received the 2004 AAAS Mentor Award. Sankar was recognized for facilitating or mentoring 46 Ph.D. students, including 22 underrepresented minorities.

2004 Lifetime Mentor Award

Hughes, winner of the 2004 Lifetime Mentor Award, "is a model teacher, scholar and mentor who is selfless in her dedication to improving the advancement of young women in mathematics and science," explained Yolanda S. George, deputy director of Education and Human Resources at AAAS. "She works very closely with her students and has been successful in obtaining many grants that were used to promote student research and professional opportunities in mathematics. This has helped students to participate in national meetings, and to present posters and papers."

With her colleague, Sylvia Bozeman of Spelman College, Hughes developed two successful national programs—the Spelman-Bryn Mawr Summer Mathematics Program and EDGE (Enhancing Diversity in Graduate Education: A Transition Program for Women in the Mathematical Sciences)—to help young women transition from undergraduate, through graduate programs in mathematics. To date, more than 100 young women have been served by the joint Bryn Mawr/Spelman programs, George reported.

The former president of the Association for Women in Mathematics, Hughes maintains an active research program and "has been unrelenting in her efforts on behalf of women, particularly minority women," said Bryn Mawr Provost Ralph Kuncl.

Hughes remains "a passionate advocate for women in mathematics," said Mary Patterson McPherson, vice president of The Andrew W. Mellon Foundation and president emeritus of Bryn Mawr College. "She has not only inspired many young women with the courage to take up mathematics seriously, but she has followed closely the fortune of every one of her students through their graduate programs and on into their professional careers."

Former student Laura Novak, Ph.D., added that Hughes "is acutely sensitive to the difficulties of graduate school in the mathematical sciences, particularly those encountered by women with liberal arts backgrounds." Hughes earned her Ph.D. in mathematics from the University of Illinois at Chicago.

The AAAS Mentor Award for Lifetime Achievement honors members of the Association who have mentored and guided significant numbers of underrepresented students toward a Ph.D. degree in the sciences, as well as scholarship, activism and community-building on behalf of underrepresented groups, including women of all racial or ethnic groups; African-American, Native-American, and Hispanic men; and people with disabilities. This award often recognizes individuals with 25 or more years of success in mentoring students. The recipient receives $5,000 and a commemorative plaque.

AWIS Fellow

Rhonda was also named a fellow of the Association for Women in Science in February. The AWIS Fellows Program recognizes and honors women and men who have demonstrated exemplary commitment to the achievement of equity for women in science, technology, engineering, and mathematics.

Haimo Awards

In 1991, the MAA instituted the Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching of Mathematics in order to honor college or university teachers who have been widely recognized as extraordinarily successful and whose teaching effectiveness has been shown to have had influence beyond their own institutions.

Citation for Gerald L. Alexanderson

Jerry Alexanderson is a master teacher, an inspiration to both students and colleagues. In his 47 years of teaching at Santa Clara University (35 years of which he was department chair), he has consistently had the reputation for being not only the best, but also one of the most demanding teachers. His classes are amusing, entertaining, and highly informative, an impressive mix of challenging mathematics and historical anecdotes, delivered clearly and concisely.

Many mathematicians (and former students in other careers) discovered the excitement of mathematics in the first course they took with Jerry, and his personal advice and encouragement continues to guide many of those careers today. "Memories of my classes with Jerry include a tour of complex numbers and DeMoivre's Theorem in the first week of a freshman calculus class, a cast of colorful mathematicians (dueling and scratching graffiti on bridges), impossible exam questions (which somehow we were able to answer), fast chalk, bow ties, and eyes peering over glasses in (mock?) surprise that some cultural or intellectual fact had slipped our minds."

Jerry is also an indefatigable author and editor, producing roughly 100 articles and reviews, five undergraduate texts (on trigonometry, problem solving, abstract algebra, and discrete mathematics), two collections of mathematics contest problems, and four resource books that focus on mathematical people and their interests. He has served as editor of *Mathematics Magazine,* problems editor of *The American Mathematical Monthly,* editor of the *Spectrum* book series, and as Director of the Putnam Competition. Jerry's interest in excellent teaching at all levels led to his involvement in sixteen NSF summer and in-service institutes for teachers in California and in Switzerland, and in five NSF Cooperative College-School Science Projects for gifted students.

Gerald L. Alexanderson has been called "a true Renaissance man" for his breadth of knowledge, far-ranging interests, and his devotion to the art of teaching. We are delighted to honor him with the Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics.

Biographical Note

Educated at the University of Oregon and Stanford University, Gerald L. Alexanderson joined the faculty of Santa Clara University in 1958, where he is currently Valeriote Professor of Science. At Stanford he started off with a course from George Pólya and was strongly influenced by his teaching style and his interest in problems. In 2000, the MAA published his biography of Pólya. For the MAA, Alexanderson served as editor of *Mathematics Magazine,* and later as secretary and president.

As to hobbies, contrary to widespread rumors, Alexanderson does not climb mountains, ski, go windsurfing, or otherwise participate in extreme sports. He leads a quiet life in California, sedulously avoiding inclement weather he might encounter elsewhere. As editor of the MAA's *Spectrum* Series, he reads lots of book manuscripts. Unfortunately this makes it quite impossible for him to read any books that have already been published.

Response from Professor Alexanderson

I deeply appreciate this award and wish to thank the members of the Haimo Award Committee, officers and board members of the MAA. In particular, I would like to mention one of my closest friends, Deborah Tepper Haimo, who was MAA president when I was secretary. We worked together harmoniously, I think without exception, throughout her term of office and beyond. I have the greatest respect for Debbie's foresight, her generosity in supporting these awards, and her deep loyalty to our community. A colleague of mine recently produced a DVD on winners of the Haimo Award and I saw it a few weeks back. It is humbling to be in the company of such stellar teachers and, I would like to think, good friends. Thank you very much.

Citation for Deborah Hughes-Hallett

Deborah Hughes-Hallett is known for her superb skills in the classroom, having "an uncanny ability to make clear... the remarkable and beautiful nature of mathematics." She excels at all scales, from the classroom to the international educational scene. Her pioneering programs at the

University of Arizona and at Harvard will continue to support and inspire the worldwide teaching of mathematics for decades. The best known is the Harvard-based Calculus Consortium, which has developed alternative calculus curricula and fostered a lively national debate on the teaching of calculus.

Less well-known courses shaped and taught by Deborah in her 35-year career are the precalculus course Math Ar at Harvard, and (currently) an innovative Mathematics for Business Decisions course at the University of Arizona. Her key role in the design and delivery of mathematics courses for the Summer Program for the Mid-Career Master in Public Administration and the Master in Public Administration in International Development at Harvard's Kennedy School of Government has won high praise. These courses reach an astonishing variety of students: underprepared freshmen needing remediation, minority students seeking research careers, and an array of senior level government officials and NGO officials from developing countries. They have involved a fundamental rethinking of either curriculum or method and are driven by her uncompromising devotion to her students and her rigorous understanding of how they think. "To Deb, no question is annoying, no student is beyond help." At the Kennedy School, Deb attends each lecture in the program's core economics, statistics, and optimization courses so she can link her teaching to the applications encountered there.

Deborah's insights and exemplary teaching have influenced many others: undergraduates who teach Math Ar, graduate assistants at Harvard and Arizona, and high school and university teachers who have attended her many workshops on teaching calculus.

For her extraordinary commitment to the understanding of learning and teaching mathematics, it is a great pleasure to award Deborah Hughes-Hallett with the Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics.

Biographical Note

Deborah Hughes-Hallett is Professor of Mathematics at the University of Arizona and Adjunct Professor at the Kennedy School of Government, Harvard. With Andrew M. Gleason at Harvard, she organized the Calculus Consortium based at Harvard, which brought together faculty from a wide variety of schools to work on undergraduate curricular issues. She is actively involved in discussions about the teaching of undergraduate mathematics at the national and international level and is an author of several college level mathematics texts. She recently completed work on a report for the National Academy of Sciences' Committee on Advanced Study in American High Schools and is a member of the MAA Committee on Mutual Concerns. In 1998 and 2002 she was co-chair of the International Conference on the Teaching of Mathematics in Greece, attended by several hundred faculty from about 50 countries. She established programs for master's students at the Kennedy School of Government, precalculus, and quantitative reasoning courses (with Andy Gleason), and courses for economics majors. She received the Louise Hay Award and was elected a fellow of the American Association for the Advancement of Science for contributions to mathematics education. She won the three teaching prizes given at Harvard.

Response from Professor Hughes-Hallett

I want to thank Debbie Haimo for making this award possible, my department for nominating me, and the MAA for selecting me. Most of all, I want to thank my teachers who taught me enough to win it. These teachers—my students at Harvard, Arizona, and Middle East Technical University—have patiently guided my efforts to understand their thinking processes. Their excitement at a problem understood, and their frustration at a theorem still murky, fascinate and challenge me. The delight in their eyes as they suddenly see a vista of connections, the determination in their voices as they realize that they too can succeed in mathematics, inspire me. Above all, students have taught me that my belief in them is more powerful than the clearest explanation or the best-designed class. I am honored to have watched so many students find their mathematical wings and soar.

Citation for Aparna Higgins

Aparna Higgins is one of the dynamos of the US mathematical community. Her ease with and genuine connection to students is remarkable; her dedication to teaching and mentoring is recognized by colleagues near and far. At the University of Dayton, where she has been for 20 years, she has developed several new courses, and "she is fearless to incorporate new pedagogical strategies into the classroom." She teaches with passion and high expectations, and her students respond, acknowledging her nurturing interest that extends

far beyond classroom and graduation. Her tireless service to the Honors program (directing research of 11 honors students) and organization of undergraduate mathematics conferences has had a profound impact. In the larger mathematical community, she has given generous time in serving on the MAA Student Chapters Committee, the MAA Subcommittee for Research by Undergraduates, and in co-directing Project NExT.

Aparna's own web page reveals her not-so-well-kept secret: "I love mathematics, and I love teaching. I enjoy reading mathematics and reading about it, I enjoy discussing mathematical things—even jokes, and I enjoy spending time with mathematicians and with students who are interested in mathematics." This love of all things mathematical and the desire to encourage others fuels her charisma, energy, and enthusiasm. Her joy is contagious in the classroom, at MAA student chapter meetings, in her REU summer programs, and with Project NExT Fellows.

Aparna has received two teaching awards from the University of Dayton and the 1995 MAA Ohio Section award. She has been a key person responsible for the strong interest in getting undergraduates involved in research, both by directing REU programs at the University of Dayton, and in giving frequent minicourses at AMS-MAA joint meetings and for Project NExT on how to engage undergraduate students in mathematics research.

For her passionate devotion to teaching and mentoring, it is a great pleasure to present Aparna Higgins with the Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics.

Biographical Note

Teaching has always been part of the professional and personal lives of Aparna Higgins. Her parents were teachers, her husband teaches mathematics, and her mother-in-law was a teacher. Aparna received her B.Sc. in mathematics from the University of Bombay, India, in 1978, and her M.S. (1980) and Ph.D. (1983) degrees from the University of Notre Dame. She is a Professor at the University of Dayton, Ohio, where she has taught since 1984, except for three interesting leaves spent at the Naval Postgraduate School in Monterey, California, and the United States Military Academy in West Point, New York, where she continued to learn about the teaching of mathematics. Aparna sees in-class teaching as only one part of introducing students to the profession of mathematics. She has encouraged students to do mathematics outside of class as recreation or as research, and she has created events for students to present student-generated mathematics. Her greatest professional satisfaction has come from directing students in undergraduate research. Her most enjoyable service has been on the MAA Committee on Student Chapters and as a co-director of Project NExT. Both those activities have put her in touch with about a thousand people all eager to talk about her favorite subject—teaching undergraduate mathematics.

Response from Professor Higgins

I am deeply honored and humbled to receive this award from the Mathematical Association of America. I thank the MAA for the award and for the opportunities it has provided me to make contributions to the mathematical development of students and new faculty, by letting me serve on the Committee on Student Chapters and on the Project NExT team. My gratitude to Chris Stevens and Joe Gallian is immeasurable. I have been fortunate to work with these two deeply thoughtful and very accomplished teachers of mathematics, whose encouragement and support has helped me hone my ideas and efforts in teaching mathematics and in undergraduate research. I thank Harry Mushenheim, whose office has been next to mine for twenty years, for being my mentor and my partner in the REU ventures, and I thank my chairs who have helped me implement my ideas for the benefit of our students at the University of Dayton. Abraham Goetz of the University of Notre Dame and M. S. Huzurbazar of the Institute of Science in Bombay taught me, by their examples, about loving mathematics for its own sake, and about enjoying one's classes and maintaining high standards of learning, no matter the level of the course. I thank my students for challenging my teaching beliefs and making me reflect on my teaching. I am very grateful to my Honors thesis students, from whom I learned much about the process of creating mathematics, and who taught me how to be supportive and challenging simultaneously, and how to move them ahead without leading them.

I thank the Project NExT Fellows and consultants, who have been so eager to share with me their ideas for good teaching and their successes and failures. In particular, Gavin LaRose, Judith Covington, and Wiebke Diestelkamp have been valuable contributors to my efforts with students.

My most important help and inspiration comes from my husband, Bill Higgins, who teaches mathematics at

Wittenberg University. Thank you, Bill, for the insights on mathematical questions, for the patient explanations of student behavior, for the discussions at the dinner table on what example best conveys a specific mathematical idea, for keeping our home computers running, and for providing the steady support and safe environment for our family that has allowed me to pursue my professional interests.

MAA Certificate of Meritorious Service

Citation for Barbara Osofsky, New Jersey Section

The New Jersey Section is pleased to nominate Barbara L. Osofsky to be the recipient of the 2005 Mathematical Association of America Certificate of Meritorious Service.

Professor Osofsky became a member of the MAA in 1958, while an undergraduate student in Cornell University, and has been a member ever since, becoming a life member in 1986. She received her B.A. and M.A. in mathematics, with a minor in physics, from Cornell and then moved to New Jersey, where she began her teaching career as an instructor at Douglass College of Rutgers University. She completed her Ph.D. in mathematics at Rutgers, and then she spent a year as a member of the Institute for Advanced Study on an NSF postdoctoral program. Barbara has been teaching and doing research in homological algebra at Rutgers University ever since.

Barbara is a member of the MAA, AMS, and AWM. She was active in both the AMS and the MAA early in her career, but later became much more active in the MAA. Her interests and service have been diverse and significant. She has served on and/or chaired a large number of national MAA committees: program committees for national meetings, including chairing the program committee for the last joint summer meetings with the AMS in Seattle 1996, and the program committee for the first MAA MathFest in Atlanta in 1997; editorial committees for the MAA, including chairing the Carus Monograph Editorial Committee for three years early in her career, and now back on that committee; two ad hoc committees to select a *Monthly* editor; committees to select the Chauvenet and Beckenbach award winners and to select a Hedrick Lecturer; and the Short Course Subcommittee, which she chaired for several years. She helped write a manual for organizers of Short Courses at the winter and summer national meetings and selected organizers for the Short Courses. She has served as the New Jersey Section Governor (1994–1997) and as First Vice President of the MAA at the national level (2000–2002).

For her many years of outstanding, dedicated service at both the local and national levels, the New Jersey Section regards Professor Osofsky to be well deserving of the MAA Award for Meritorious Service.

Response from Professor Osofsky

It is indeed an honor to be the 2005 recipient of the Certificate of Meritorious Service of the Mathematical Association of America. I thank the New Jersey Section for nominating me. I very much appreciate this award, but even more I appreciate the invaluable opportunity I have had to work with so many wonderful, dedicated, creative people in the New Jersey Section and on the national level of the Mathematical Association of America.

Since my undergraduate days at Cornell in the late 1950s, when I began my long association with the MAA by taking problems in the *Monthly* section, I have watched the MAA grow and blossom. I later began attending meetings and serving on a variety of MAA committees to do my small part in contributing to this growth. As a result, I became more and more in awe of the many MAA visions of what the undergraduate mathematical experience might be, the insights of our members on how to get there, and the incredibly large amounts of time and effort spent by my MAA colleagues to further the goals of the Association. This has been a source of great pleasure to me, and I am very grateful to have had the chance to work with such dedicated people in our common cause.

Satter Prize

The Ruth Lyttle Satter Prize was established in 1990 using funds donated by Joan S. Birman in memory of her sister to honor Satter's commitment to research and to encourage women in science. The prize is awarded every two years to recognize an outstanding contribution to mathematics research by a woman in the previous five years.

Citation for Svetlana Jitomirskaya

The Ruth Lyttle Satter Prize in Mathematics is awarded to Svetlana Jitomirskaya for her pioneering work on nonperturbative quasiperiodic localization, in particular for results in her papers (1) "Metal-insulator transition for the

almost Mathieu operator," *Ann. of Math.* (2) 150 (1999), no. 3, 1159–1175, and (2) with J. Bourgain, "Absolutely continuous spectrum for 1D quasiperiodic operators," *Invent. Math.* 148 (2002), no. 3, 453–463. In her *Annals* paper, she developed a non-perturbative approach to quasiperiodic localization and solved the longstanding Aubry-Andre conjecture on the almost Mathieu operator. Her paper with Bourgain contains the first general non-perturbative result on the absolutely continuous spectrum.

Biographical Note

Svetlana Jitomirskaya was born on June 4, 1966 and raised in Kharkov, Ukraine, in a family of two accomplished mathematicians (later three, counting her older brother). She received her undergraduate degree (1987) and Ph.D. (1991) from the Moscow State University. Since 1990 she has held a research position at the Institute for Earthquake Prediction Theory, in Moscow. In 1991 she came with her family to Southern California. She was employed by UC Irvine as a part-time lecturer (1991–1992), and rose through the ranks to visiting assistant professor (1992–1994) and to regular faculty (since 1994). She took a leave from UCI to spend nine months at Caltech (1996). She was a Sloan fellow (1996–2000) and a speaker at ICM 2002. She is married and has three children, ranging in age from 1 to 17.

Response from Professor Jitomirskaya

I am very grateful to the AMS for this honor, and to the members of the Ruth Lyttle Satter Prize Committee for identifying and selecting me. It is humbling to be on the same list with the past recipients of this prize.

I must say that I have never felt disadvantaged because of being a woman mathematician; in fact, the opposite is true to some extent. However, compared to most others, I did have a unique advantage—a fantastic role model from early on, my mother Valentina Borok, who would have been much more deserving of such a prize than I am now, had it been available in her time. I see my receiving of this prize as a special tribute to her memory.

It is a pleasure to use this opportunity to say some thanks. It was great to be raised by my parents, and I was lucky to be a student of Yakov Sinai, who was both my undergraduate (since 1984) and graduate advisor. I am also very grateful to Abel Klein, whose support and encouragement in the postdoctoral years were crucial for my career. I had many wonderful collaborators from each of whom I learned a lot. Three of those particularly stand out, as they have majorly influenced my work. They are, in chronological (for me) order: Barry Simon, Yoram Last, and Jean Bourgain. Each of them has not only introduced new techniques to me and had a visible influence on my style and choice of topics, but provided a special inspiration and changed the way I think about mathematics. I am also grateful to Jean for entering, with his methods and ideas, the area of quasiperiodic operators. That certainly brought this field to a new level and changed how it is perceived by many others.

Finally, special thanks go to my family, as I wouldn't have accomplished a fraction of what I did without patience, support, and a lot of sacrifice on their part.

Distinguished Service Award

Citation for Gerald L. Alexanderson

The Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics is the most prestigious award for service made by the Association, to be given for service to mathematics that has been widely recognized as extraordinarily successful. It would be difficult to find anyone who fits this description better than Gerald L. Alexanderson.

Jerry has a long record of able service to mathematics as a practitioner, teacher, administrator, professional organization leader, publicist, advocate, and enthusiast whose love for mathematics and its people comes through clearly in his public talks and widely-read books. One of his most notable characteristics is his extraordinary compassion and concern for the human beings who come into contact with our profession, whether they be the students whose knowledge and interest he has furthered as an award-winning teacher, or the mathematicians and their wives for whom Jerry has provided care in their old age. His sympathy for his interviewees in the *Mathematical People* volumes (coauthored with Don Albers and Constance Reid) makes his subjects come alive as real people with interesting things to say beyond mathematics, which has contributed greatly to the popularity of the books with the general public and helped counter some of the common stereotypes about mathematicians.

Jerry believes strongly in the promotion of young talent through problem solving and has been the Associate Director

of the William Lowell Putnam competition since 1975. He has coauthored two problem-solving books and each year coauthors the article on the competition's results that appears in the *Monthly.* At the local level, Jerry has distinguished himself as a strong proponent of mathematics on his own campus, Santa Clara University, serving as chair of his department for thirty-five years and in many other administrative positions within the university, as well as on its Board of Trustees. He received a President's Special Recognition Award in 1996 for this service to his institution.

On the national level, Jerry's leadership has been sought by mathematics research and professional organizations at the highest level. As the chair of the Board of Trustees of the American Institute of Mathematics since 1994, Jerry has seen that institution grow from a vision of two silicon valley businessmen interested in supporting mathematics to a world-class research institute, whose Research Conference Center receives major funding from the National Science Foundation and is preparing to move into a new state-of-the-art facility. Jerry also served for many years on the executive committee of the Fibonacci Association and as its President from 1980 to 1984.

Even without his service to the MAA, Jerry's contributions to our profession would merit this award. However, his remarkable record of service to the Association cannot go unmentioned. During his fifty years of MAA membership he has served as associate editor of the *College Mathematics Journal,* co-editor of the problems section of the *Monthly,* editor of *Mathematics Magazine,* and editor of the *Spectrum* book series; as chair of the Council on Publications and the Development Committee; as chair and member of countless other sectional and national MAA committees, including the Board of Governors on which he is currently serving his twenty-first consecutive year and twenty-fourth overall; as secretary and chair of the Northern California Section; and as the Association's First Vice President, Secretary, and, from 1997 through 1999, its President. Jerry currently chairs the committees overseeing the remodeling of the MAA's carriage house into its new Mathematical Sciences Conference Center and planning the mathematical sessions to be held there, which is just one example of his continuing leadership as the Association expands in new directions.

Much of Jerry Alexanderson's professional life has been devoted to assuring that the achievements of other mathematicians are recognized and appreciated. For this reason, it is particularly fitting for his own achievements to be recognized by the MAA's highest award for service. For his long record of service at all levels to mathematics and its people, the Mathematical Association of America is pleased to present Gerald L. Alexanderson the 2005 Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics.

Response from Professor Alexanderson

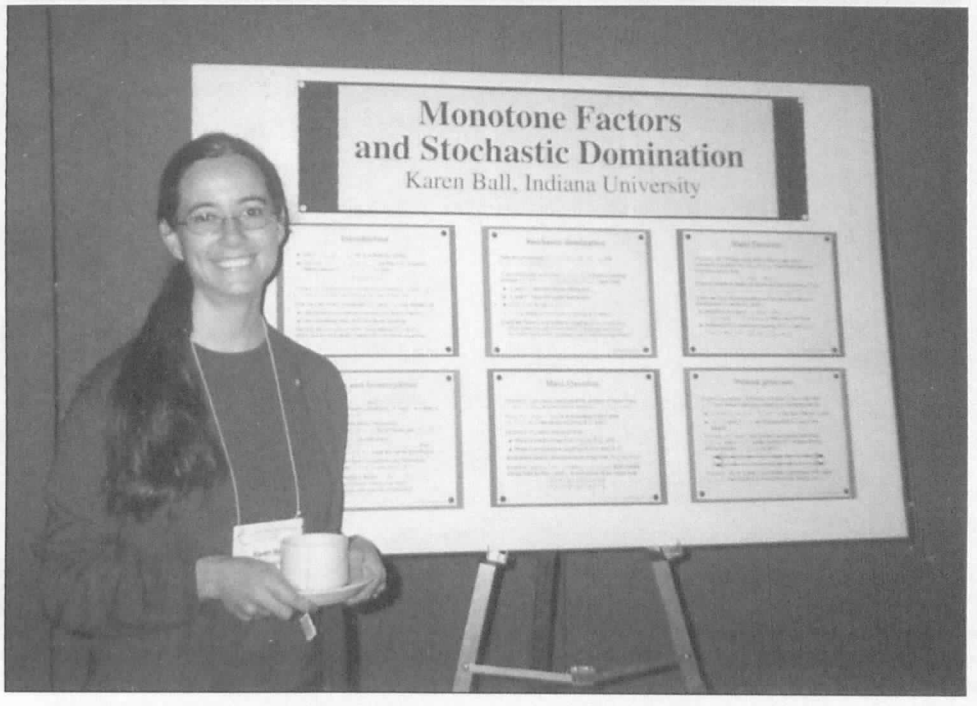
Prior to this I have never confused Atlanta with Las Vegas. But I never won a jackpot in Las Vegas comparable to this. Unaccustomed as I am to winning awards, I find that winning two within an hour is rather overwhelming. I recall an occasion similar to this in 1963 when my advisor, George Pólya, won the second of the MAA's Distinguished Service Awards at meetings in Berkeley. (In case you're wondering, the first winner was Mina Rees.) I drove Pólya to Berkeley and on the way back to Palo Alto we stopped to have dinner at the great but now almost forgotten Ritz Old Poodle Dog, a wonderfully historic San Francisco restaurant dating back to the Gold Rush. It was a fine day of celebration. I could never have imagined that forty-one years later I would be receiving this award myself.

It would have been impossible for me to accomplish much of anything at all without the help over many years of my colleagues in my own department (I won't name names because there are so many and I would risk leaving someone out), my colleagues at the MAA, and my many coauthors over the years. We are very fortunate to be in mathematics, a great field, intellectually rewarding and populated with so many dedicated, smart, and interesting people. I'm grateful to the members of the Gung-Hu Award Committee who recommended me to the Board of Governors. It gives me great pleasure to accept this award. Thank you very much—again.

Citations and responses are reprinted from the booklet January 2005 Prizes and Awards. *See http://www.ams.org/ams/prizebook05.pdf*

AWM at Atlanta JMM

Dawn, we'll miss you!
Anne Leggett, Dawn Wheeler, Linda keen, Bettye Anne Case, and Krystyna Kuperberg



Karen Ball (Indiana University) at her poster

At the Noether Dinner: Schafer Prize runner-up Elena Fuchs (Berkeley), Schafer Prize honorable mention Annalies Vuong (Santa Barbara), Schafer Prize runner-up Margaret I. Doig (Notre Dame), AWM President Barbara Keyfitz (Fields Institute), Sylvia Wiegand (Nebraska), Marty Golubitsky (Houston), Tony Chan (Berkeley), Schafer Prize winner Melody Chan (Yale), Peter Lax (CIMS), Noether Lecturer Lai-Sang Young (CIMS), Brian Marcus (UBC), Linda Keen (Lehman, CUNY)

Schafer winner Melody Chan (Yale), Hay Award winner Susanna Epp (DePaul), and then AWM President, Carolyn Gordon (Dartmouth)

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