AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

Volume 37, Number 4 NEWSLETTER July–August 2007

President's Report

AWM Members:

In July, Anne Leggett will have completed thirty years as editor of this newsletter. AWM owes her a great debt of gratitude for her work. Those of us who have written articles for the newsletter know the energy that she gives to it, saving us from embarrassing mistakes by careful reading, and responding to delays in promised articles with good humor, tolerance, and firmness.

Krystyna Kuperberg has won the Sierpinski Medal, an award given by the Polish mathematical community. She serves on the AWM Executive Committee as a member at large and is the Principal Investigator for AWM's travel grant program—for which she deserves our thanks. Details about her award will (I hope) appear in the next issue of the newsletter.

I did not attend the Snowbird meeting, but I heard that Lai-Sang Young gave a lovely Kovalevsky lecture and that the AWM workshop seemed to go particularly well. Many, many thanks to the organizers Trachette Jackson, Mary Silber, and Mary Lou Zeeman—and to the mathematicians who took the time and energy to mentor graduate students and post-docs at the workshop.

In August, Katherine St. John will give the Falconer Lecture at Mathfest. Her work concerns biology, and in her talk she will discuss related combinatorial questions. I am also pleased to see that Jennifer Tour Chayes will be giving the Hedrick Lecture Series and that Judith Grabiner will be giving an MAA Invited Address.

I am pleased to announce that our Executive Director Jenny Quinn has accepted a position as a full professor with tenure—but very sorry that her acceptance carries the implication that she will leave her position as executive

IN THIS ISSUE

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: 3500.

director of AWM. In her new position at the University of Washington at Tacoma, she will have charge of designing a mathematics curriculum, hiring new faculty, and helping to build a program at a place that intends to triple in size over the next ten years.

Jenny has been a wonderful person to work with and has done much to help AWM implement its strategic plan, while at the same time maintaining its many programs—capably and creatively. We will miss her.

A search for a new executive director is in progress. Please consider applying and encourage others to do so. Details about the job and application process are on the AWM Web site; see also pages 6 and 29. I consider the executive director very important to our organization and will be happy to answer questions about the position.

At the beginning of May, Jenny and I attended the Conference Board of the Mathematical Sciences meeting. Among other things, we heard about *Using Statistics Effectively in Mathematics Education Research,* a new report from the American Statistical Association, which may be downloaded at www.amstat.org/research_grants/pdfs/SMERReport.pdf. The report begins with several quotes, including one from the 2001 RAND Mathematics Study Panel: "The teaching and learning of mathematics in U.S. schools is in urgent need of improvement." It continues with discussion of the "scientifically based research" described in the No Child Left Behind Act as "research that involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs." What this means is of interest in the implementation of NCLB and in current debates about the effectiveness of various curricula and instructional practices.

After the CBMS meeting, I attended the Council of Scientific Society Presidents meeting. Much concern was expressed about global warming, but also about education. In my mind, these two are linked. Had science education been better in the past, there might have been more demand for legislators to attend to global warming. Had mathematics education been better in the past, it might have been easier to view the situation in terms of expected value, rather than waiting for certainty.

The CSSP has approved a letter that encourages United States participation in the Trends in International Mathematics and Science Study Advanced 2008 (TIMSS Advanced 2008), which will study the performance of students at the end of secondary schooling in mathematics and physics. As of May, the U.S. intends only to participate in the TIMSS 2007, which will study the performance of students in grades 4 and 8. Previous U.S. participation in TIMSS and its predecessors has included grade 12 participation.

Elsewhere in the newsletter, you will find information about congressional legislation intended to improve mathematics and science education: the America Competes Act (which, in addition to affecting education, would double authorized funding for NSF for the next five years); the "10,000 Teachers, 10 Million Minds" Science and Math Scholarship Act; and the Sowing the Seeds through Science and Engineering Research Act.

It's interesting to contrast these acts with the recommendations of the Glenn Commission Report of 2000. The press release for the latter says, "Elected officials, educators, and business leaders cite urgent need to act 'before it's too late.' " The Glenn Commission report set out three goals:

- Establish an ongoing system to improve the quality of mathematics and science teaching in grades K–12.
- Increase significantly the number of mathematics and science teachers and improve the quality of their preparation.
- Improve the working environment and make the teaching profession more attractive for K–12 mathematics and science teachers.

Current legislation seems to focus on teacher preparation and in-service professional development, but not to include the systemic issues identified by the Glenn Commission. Research presented to the Commission found that teachers left teaching at an alarming rate; hence it is not surprising that the Commission recommended that their working conditions be improved. Since 2000, teachers' working conditions may have become even less attractive due to the No Child Left Behind Act, which requires testing in mathematics and reading in grades 3 to 8 and at least once in high school. This in turn has required a large increase in the creation of tests. Making a good test is a labor-intensive, time-consuming, and expensive task which sometimes gets short shrift.

Tests can provide opportunities for teachers to learn more mathematics and more about their stdents' knowledge

MEMBERSHIP AND NEWSLETTER INFORMATION

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Individual: $55 Family (no newsletter): $30
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Friend: $1000 Benefactor: $2500
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Dues in excess of $15 and all contributions are deductible from federal taxable income when itemizing.
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See www.awm-math.org for details on free ads, free student memberships, and ad discounts.
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See the AWM website for details.

Subscriptions and back orders
All members except family members receive a subscription to the newsletter as a privilege of membership. Libraries, women's studies centers, non-mathematics departments, etc., may purchase a subscription for $55/year ($65 foreign). Back orders are $10/issue plus shipping/handling ($5 minimum).

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

Newsletter ad information
AWM will accept advertisements for the *Newsletter* for positions available, programs in any of the mathematical sciences, professional activities and opportunities of interest to the AWM membership and other appropriate subjects. The Managing Director, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the* Newsletter *must be Affirmative Action/Equal Opportunity designated.* Institutional members receive discounts on ads; see the AWM website for details. For non-members, the rate is $100 for a basic four-line ad. Additional lines are $12 each. See the AWM website for *Newsletter* display ad rates.

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

Addresses
Send all **Newsletter** material **except ads and book review material** to Anne Leggett, Department of Mathematics and Statistics, Loyola University, 6525 N. Sheridan Road, Chicago, IL 60626; e-mail: leggett@member.ams.org; phone: 773-508-3554; fax: 773-508-2123. Send all **book review** material to Marge Bayer, Department of Mathematics, University of Kansas, 405 Snow Hall, 1460 Jayhawk Boulevard, Lawrence, KS 66045-7523; e-mail: bayer@math.ku.edu; fax: 785-864-5255. Send everything else, **including ads and address changes**, to AWM, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030; phone: 703-934-0163; fax: 703-359-7562; e-mail: awm@awm-math.org.

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

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

AWM-NET

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

AWM DEADLINES

Sonia Kovalevsky High School Mathematics Days: August 4, 2007

AWM Workshop at JMM: August 31, 2007

Alice T. Schafer Prize: October 1, 2007

NSF-AWM Travel Grants: October 1, 2007 and February 1, 2008

AWM Noether Lecturer: October 15, 2007

AWM-SIAM Kovalevsky Prize Lecturer: November 1, 2007

AWM Essay Contest: Biographies of Contemporary Women in Mathematics: November 2, 2007

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of mathematics. I learned about one such example because I was involved with editing *Assessing Mathematical Proficiency,* a book that is the outcome of a 2004 workshop at the Mathematical Sciences Research Institute (available at http://www.msri.org/~levy/files/Book53/book53-all.pdf). Several chapters describe aspects of the Silicon Valley Mathematics Initiative which uses student work on tests to good effect as part of teachers' professional development. Other chapters present various points of view on testing, some from mathematicians, some from others (notably Susan Sclafani, a former Assistant Secretary of Education).

The current emphasis on testing accentuates the importance of what test developers call "construct validity": the notion that a test or test item measures what it is intended to measure. In my opinion, mathematicians and scientists have an important role to play in contributing to better understanding of mathematical and scientific constructs—but in order to do so, they need to be able to communicate with test developers, policy makers, and education researchers.

Cathy Kessel
Berkeley, CA
June 8, 2007

See Web site for AWM Slate!

The slate for this fall's AWM election will be posted at awm-math.org by the time you receive this newsletter. We will be electing a President-Elect, a Treasurer, and four Members-at-Large. Nominations by petition signed by 15 members are due to our president by **September 1, 2007**. Statements from all candidates will appear in the November-December issue.

Letter to the Editor

Parental Leave

Over the years, I have had occasions to debate and discuss parental leave for women mathematicians. The FMLA act guarantees 6–12 weeks unpaid leave at the birth of a child. Some universities offer semester long paid parental leave. Others offer more ad hoc leaves where teaching assignments are rearranged. Then there are universities like mine which offer up to three semesters unpaid leave. The AAUP has a discussion of the various policies and states that the legal requirements of the FMLA "establish minimum benefits only." The AAUP "encourages universities to offer significantly greater support for faculty members and other academic professionals with family responsibility."

However, I have had mixed reactions from men and women mathematicians as to whether universities should offer paid leave. My union representative reported that few faculty at my university could afford to take the full leave that I took, many arranging light teaching schedules with their department instead. These light teaching loads were then naturally followed by years with high teaching loads, leaving the women with toddlers to care for at a loss for time to do any research. Other faculty questioned why women professors who are definitely fairly upper class need paid maternity leave and cannot save up for a semester off when working class women have no such opportunities. Certainly university staff need paid maternity leave more than faculty.

This latter point really concerned me. How much of an effort should we put in as women mathematicians to get paid maternity leave for women mathematicians? Why not fight for paid maternity leave for all women? By making the fight universal we gain allies in professions where women are a strong proportion of the population.

It was then that I discovered the Wikipedia article "Parental Leave." In the Americas, 31 countries offer paid maternity leave, many with 100% pay for significantly more than six weeks. Europe also has extremely generous parental leave policies. Some countries offer significant salaries for over a year. Furthemore there are organizations in the United States like MomsRising.org that are fighting for paid maternity leave in the United States. They are working state by state rather than tackling the US Congress and have met with some success.

So I'm writing today to let all of you know that we can demand paid family leave in the United States and our students can help fight for it. This isn't an issue of women mathematicians but an issue of all women and all parents.

Christina Sormani
Associate Professor
Department of Mathematics
CUNY GC and Lehman College

AWM Announces Search for New Executive Director

Over the last few years, the Association for Women in Mathematics (AWM) has seen many changes—from hiring an association management company to hiring a new Executive Director to restructuring the Executive Committee with task-oriented portfolios. Recently, Executive Director Jennifer Quinn announced that she was stepping down effective June 30, 2007 to accept a position at the University of Washington, Tacoma. "I consider myself very fortunate to have served as Executive Director of AWM," says Quinn, "It was a rare opportunity to work with many creative, dedicated, and talented women mathematicians."

During her time as Executive Director of AWM, Quinn supported the work of the volunteer officers on the AWM Executive Committee and actively engaged with the AWM membership at the Joint Mathematics Meetings, the SIAM Annual Meeting, MathFest and other events in which AWM participates. Quinn's influence can be seen in the success of recent membership drives, grant writing and reporting, press releases, volunteer efforts, and new initiatives.

Barbara Keyfitz (University of Houston), Past-President of AWM and current Director of the Fields Institute in Toronto reacted with mixed emotion: "As a society, we are dedicated to the principle of helping women to achieve their full potential, and Quinn's career has professor written all over it. I am delighted that a university has recognized her talent and I know she will deliver more than full value. She has shown AWM how much we can achieve within our new office structure with an effective professional Executive Director." Current AWM President Cathy Kessel says: "I'm very pleased for Quinn. I'd like to add that leaving for a tenured full professorship surely accentuates the status of AWM Executive Director. I hope that helps us to attract some good applicants."

The search for a new executive director is now under way. AWM seeks an outstanding individual who is passionate about supporting women in mathematics. The part-time position can be combined with an existing academic appointment via course reductions. The AWM office is in the DC area, but the geographic base of the Executive Director can be anywhere in North America.

Nominations, inquiries, and leads may be directed to Kessel at cbkessel@earthlink.net. For more information on the position and application details see www.awm-math.org/EDsearch. Review of applications will begin immediately and continue until the position is filled.

Call for Nominations: The 2009 Noether Lecture

AWM established the Emmy Noether Lectures to honor women who have made fundamental and sustained contributions to the mathematical sciences. This one-hour expository lecture is presented at the Joint Mathematics Meetings each January. Emmy Noether was one of the great mathematicians of her time, someone who worked and struggled for what she loved and believed in. Her life and work remain a tremendous inspiration.

The mathematicians who have given the Noether lectures in the past are: Jessie MacWilliams, Olga Taussky Todd, Julia Robinson, Cathleen Morawetz, Mary Ellen Rudin, Jane Cronin Scanlon, Yvonne Choquet-Bruhat, Joan Birman, Karen Uhlenbeck, Mary Wheeler, Bhama Srinivasan, Alexandra Bellow, Nancy Kopell, Linda Keen, Lesley Sibner, Ol'ga Ladyzhenskaya, Judith Sally, Olga Oleinik, Linda Rothschild, Dusa McDuff, Krystyna Kuperberg, Margaret Wright, Sun-Yung Alice Chang, Lenore Blum, Jean Taylor, Svetlana Katok, Lai-Sang Young, Ingrid Daubechies, and Karen Vogtmann.

The letter of nomination should include a one-page outline of the nominee's contribution to mathematics, giving four of her most important papers and other relevant information. *Five* copies of nominations should be sent by **October 15, 2007** to: The Noether Lecture Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. If you have questions, phone 703-934-0163, e-mail awm@awm-math.org or visit www.awm-math.org. Nominations via email or fax will not be accepted.

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, 2007. She must either be a US citizen or have a school address in the US. The Prize will be awarded at the Joint Prize Session at the Joint Mathematics Meetings in San Diego, California, January 2008.

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, 2007**. If you have questions, phone 703-934-0163, e-mail awm@awm-math.org or visit www.awm-math.org. Nominations via e-mail or fax will not be accepted.

Olga Taussky Todd Lecture

Pauline van den Driessche will deliver the Olga Taussky Todd Lecture at the 2007 International Congress on Industrial and Applied Mathematics in Zurich this July. The honor was jointly introduced by the Association for Women in Mathematics, European Women in Mathematics, and organizers of the ICIAM 2007 Congress. The lecture honors the memory of Olga Taussky Todd, whose scientific legacy is in both theoretical and applied mathematics and whose work exemplifies the qualities to be recognized. This year's lecture is supported by Google.

Van den Driessche is a leading applied mathematician, known for her work in mathematical biology and linear algebra. Her major impact in mathematical biology has been the application of new mathematical methods to the study of the dynamics of epidemics. Her work investigates epidemic models with variable population size, the role of immigration on disease dynamics, the possibility of multiple steady states, and reproduction numbers and sub-threshold endemic equilibria for compartmental models of disease transmission. The mathematical tools she has developed have been applied by her and others to multi-city disease dynamics, HIV-AIDS control, and, more recently, West Nile virus outbreak predictions. Many of the deep questions in matrix theory that she has tackled arose from problems in biological modeling. These include a famous paper with Jeffries and Klee in which they characterize sign-stable matrices, as well as a series of papers in factorization theory.

Van den Driessche received a Bachelor of Science degree in 1961 and a Master of Science degree in 1963, both at Imperial College, and a Ph.D. in 1964 from University College of Wales, Aberystwyth. She joined the University of Victoria in 1965 and has been a Professor in the Department of Mathematics and Statistics there since 1983. She is currently cross-appointed in the Department of Computer Science. She has organized numerous conferences, served on NSERC's Grant Selection Committee, and served on the CMS Board of Directors and the Council of the Canadian Applied Mathematics Society. She is an editor of the *Canadian Applied Mathematics Quarterly* and the *SIAM Journal on Applied Mathematics*. She is the recipient of the Canadian Mathematical Society's 2007 Krieger-Nelson Prize, recognizing outstanding research by a female mathematician.

Van den Driessche has served as a mentor to many young mathematicians. Her impressive list of publications reveals an unusually large number of collaborators, including students and junior colleagues. It has been said that her tremendous productivity and vision will inspire new generations of mathematical researchers, women and men alike.

Katherine St. John

Falconer Lecture

Katherine St. John will deliver the AWM-MAA Etta Z. Falconer Lecture at MathFest in San Jose, CA this August. The Falconer Lectures honor women who have made distinguished contributions to the mathematical sciences or mathematics education. St. John is an Associate Professor of Mathematics in the Department of Mathematics and Computer Science of Lehman College, City University of New York. Her research interests lie in computational biology, random structures and algorithms, languages, and logic. Her lecture will focus on some of the elegant, combinatorial questions that arise from assembling, summarizing, and visualizing phylogenetic trees.

"Math and Society" Lecture Series

Fields Institute, April 2007

In May, award-winning theoretical biologist Joel E. Cohen presented the inaugural lecture in the series The Nathan and Beatrice Keyfitz Lectures in Mathematics and Social Sciences. He addressed the questions "How Many People Can the Earth Support? And How Do You Know That?"

People have been worrying about how many people the Earth can support for thousands of years. In the last 350 years, according to Cohen, scientists have published more than 60 estimates of the number of people the Earth can support. These estimates range from fewer than 1 billion to more than 1,000 billion. Professor Cohen will describe the nature and limitations of the mathematical methods used to derive these estimates.

The Earth's capacity to support people is determined both by natural constraints and by human choices concerning economics, environment, culture (including values and politics), and demography. Human carrying capacity is therefore dynamic and uncertain. However, human choice is not captured by ecological notions of carrying capacity that are appropriate for non-human populations.

Nathan and Beatrice Keyfitz

Joel E. Cohen is a professor of populations at the Rockefeller University and Columbia University in New

Joel E. Cohen

York City and heads the Laboratory of Populations at Rockefeller and Columbia University. His research deals with the demography, ecology, epidemiology and social organization of human and non-human populations and with mathematical concepts applicable to these fields. In 1997 he was the first recipient of the Olivia Schieffelin Nordberg Award "for excellence in writing in the population sciences," in recognition of his book, *How Many People Can the Earth Support?* (1995). In 2002 he received the Mayor's Award for Excellence in Science and Technology from the City of New York. In 1997 he was elected to the U.S. National Academy of Sciences, and the following year he shared the Fred L. Soper Prize awarded by the Pan American Health Organization for his work on Chagas' disease. In 1999, Cohen was the co-recipient of the Tyler Prize for Environmental Achievement. His most recent book is *Forecasting Product Liability Claims: Epidemiology and Modeling in the Manville Asbestos Case* (2004).

This series of public lectures, made possible by the generous support of Nathan and Beatrice Keyfitz, will focus on the topic of "mathematics and the social sciences" and will be held annually. Lecturers are selected by a distinguished international committee consisting of both mathematicians and social scientists. All lectures are open to the public and everyone is welcome. The purpose of the series is both to inform the public of some of the ways quantitative methods are being used to design solutions to societal problems, and to encourage dialogue between mathematical and social scientists. These lectures will be of interest to the university community as well as to individuals involved in public administration, economics, health policy, social and political science. See www.fields.utoronto.ca/programs/scientific/keyfitz_lectures/ for further details.

In Memoriam

Deborah Tepper Haimo

Mathematical Association of America, May 2007

Former MAA President Deborah Tepper Haimo died at the age of 85 in Claremont, CA on May 17, 2007. Professor Haimo served as MAA President from 1991 to 1992. During her tenure as president she helped reorganize the MAA's committee structure, created the Franklin and Deborah Tepper Haimo award honoring outstanding teaching, and encouraged the participation of women in mathematics at every level and in the MAA.

Professor Haimo attended Radcliffe College as an undergraduate and received her Ph.D. from Harvard in 1964. She went on to a distinguished teaching career at the University of Missouri-St. Louis. After retirement she moved to La Jolla, CA and became active in the department of mathematics at the University of California, San Diego, participating in seminars and social events.

Haimo is remembered by MAA Secretary Martha Siegel, who says: "Many of us who knew and worked with Debbie found her an excellent role model, a person with high personal and professional standards. She had a strong work ethic in everything she tackled. She made many significant contributions to the MAA when she served as President in 1991 and 1992. Our Association owes a great deal to her leadership."

Haimo is survived by five children; Zara, Ethan, Nina, Leah, and Varda Tepper Haimo, 13 grandchildren and one great grandchild.

A memorial service was held on May 28, 2007. Those who wish may make contributions in Professor Haimo's memory to the Mathematical Association of America. Please make checks payable to "MAA," write "In memory of Deborah Haimo" on the memo line, and send to: MAA Headquarters, ATTN: Lisa Kolbe, 1529 18th Street NW, Washington, D.C. 20036.

Ed. note: See also http://www.agnesscott.edu/lriddle/women/haimo.htm.

Emma Lehmer Dies at 100

Robert Sanders, Media Relations, University of California, Berkeley, May 2007

Mathematician Emma Trotskaya Lehmer, for many years a vital member of the University of California, Berkeley, mathematics community, where her late husband and father-in-law both taught as members of the faculty, died on Monday, May 7, at the age of 100.

She passed away peacefully in her sleep at her home in Berkeley.

Lehmer was an accomplished mathematician who specialized in number theory, publishing 56 papers during her lifetime, 21 of them with her husband, Derrick Henry "Dick" Lehmer, a UC Berkeley professor of mathematics who died in 1991. The couple founded in 1969 the annual West Coast Number Theory Meeting, "one of their most enduring contributions to the world of mathematicians," wrote John D. Brillhart, a professor emeritus of mathematics at the University of Arizona in Tucson who was a former student of Lehmer's husband.

Mathematician Emma Trotskaya Lehmer at her wedding in 1928, the year she graduated from UC Berkeley

"In the 63 years during which they collaborated, the Lehmers were a research team who personally influenced a large number of people with their knowledge, their courtesy and sociability, and their fine mathematical work," Brillhart said.

The University of California's anti-nepotism policy forbade Emma Lehmer from teaching at UC Berkeley while her husband was on the faculty, though she taught a few statistics courses when the policy was briefly suspended during World War II. She took this in stride, however, claiming that it allowed her to concentrate more on research. She pursued mathematics while raising two children, publishing her last paper in 1993, when she was 87.

"Mathematics was always going on in our household," said her daughter, Laura Lehmer Gould. "She was not a neglectful mother, but I don't think we stood in her way very much."

During the war, Lehmer's husband, a leading authority on number theory and computation, helped develop and test the first modern digital computer, called the ENIAC (Electronic Numerical Integrator and Calculator), at the Aberdeen Proving Ground in Maryland. Though the ENIAC was designed to calculate ballistic trajectories, Emma and her husband were able to use it occasionally on weekends to do calculations impossible with paper and pencil, such as factoring numbers to find large primes. Dick Lehmer and his father, UC Berkeley mathematics professor Derrick Norman Lehmer, had earlier built an electro-mechanical sieve capable of factoring very large numbers—a machine that they displayed at the Chicago World's Fair in 1933.

As related in the book *Notable Women in Mathematics* (1998), Lehmer recalled that she and her husband would arrange child care, stay at the lab all night long while the ENIAC processed one of their problems, then return home at dawn.

Lehmer was born Emma Trotskaya in Samara, Russia, on November 6, 1906, and moved with her family in 1910 to Harbin, Manchuria, where her father represented a Russian sugar company. Schooled at home until the age of 14, when a local school finally opened, she was inspired to pursue engineering and mathematics by an exceptional high school teacher and planned on continuing her education in Russia.

These plans were thwarted by the upheavals of World War I and the communist revolution. According to Lehmer's

daughter, Lehmer began to chafe at the insular Jewish community in Harbin and longed "to come to the United States and become an engineer." She earned money to pay her way by translating, babysitting, and tutoring children in mathematics and music.

Lehmer was admitted to UC Berkeley in 1924 to study engineering, but developed a greater interest in mathematics that led her to work during her sophomore year on number theory with Derrick Norman Lehmer. In his lab, she first met his son, Dick, who was then a junior. Upon her graduation with a B.S. in mathematics in 1928, they wed.

Emma Lehmer moved with her husband to Brown University, where she obtained an M.S. in mathematics in 1930, the same year her husband earned his Ph.D. Dick Lehmer taught at various universities until his father retired from UC Berkeley in 1937, opening the door for his own hiring. Dick Lehmer was appointed to the UC Berkeley mathematics faculty in 1940 and the couple, now with two children, moved to Berkeley.

Emma Lehmer frequently collaborated with her husband and her father-in-law. The three developed methods for computer computations to assist in solving number theory problems, and in 1930 they applied to the Carnegie Institution for funds to construct a machine that would, according to their proposal, check "a million numbers in about three minutes" in order to find factors of large whole numbers.

She never regretted her lack of a Ph.D., writing in the article "On the advantages of not having a Ph.D.": "First of all there are lower expectations. If one happens to discover something new, one's peers are pleasantly surprised and generous in their praise. This is good for the morale...."

Except for a brief period in the early 1950s, when the Lehmers protested UC's loyalty oath by moving to Los Angeles, where Dick Lehmer became director of the National Bureau of Standards' Institute for Numerical Analysis at UCLA, the couple remained at UC Berkeley until Dick Lehmer retired in 1972.

Emma Lehmer was guest of honor at a three-day conference of mathematical talks held at UC Berkeley in 2000 to honor a century of the three Lehmers' mathematical contributions. Brillhart published an announcement of Emma Lehrer's 100th birthday in the December 2006 issue of the journal *Notices of the American Mathematical Society,* suggesting that her friends send cards, and this unleashed a flurry of birthday cards that, among them, included 275 signatures.

Lehmer was an accomplished pianist in her younger years, and her daughter recalled that the family often played together, with the father playing cello, daughter playing violin or viola, and son playing clarinet. Lehmer and her husband also played informally with several faculty music groups.

An atheist and a political liberal, Lehmer campaigned for Adlai Stevenson in the 1950s, spent a lot of time registering voters at sidewalk tables and even walked picket lines in Berkeley to protests UC's involvement in Lawrence Livermore National Laboratory's bomb-making research. She also loved gardening, small children, animals and hiking in the Sierra Nevada.

Lehmer is survived by her daughter, Laura Lehmer Gould, of Woodside, CA; son, Donald, of Berkeley; four grandchildren; five great-grandchildren; and one great-great-granddaughter, almost all of whom live in the Bay Area.

In her will, Lehmer set aside money to establish a graduate fellowship in number theory at UC Berkeley. At her request, there will be no memorial service.

Keep an eye on the *Horizon*

Members of AWM may be interested in the Mathematical Association of America's coming issue of the publication *Math Horizons.* The magazine is broadly targeted to undergraduate mathematicians and other math enthusiasts. The theme of the September 2007 issue is "Women and Mathematics." It will feature interviews with Maria Klawe and Evelyn Boyd Granville plus articles on game theory (by Maria Klawe), modeling white water rafting (by Catherine Roberts), Sudoku (by Laura Taalman), and the Mathematica-inspired designs of Eri Matsui (by Gwen Fisher). AWM will be sending copies of this issue to each of our student chapters.

Book Review

Did she do it, how was she thought of, and did she care?

Arcadia, Tom Stoppard, Faber and Faber, 1994, ISBN 0571169341, 97 pp.
Proof, David Auburn, Faber and Faber, 2001, ISBN 0571199976, 96 pp.
Proof (film), John Madden, Director, 2005.
Miss Leavitt's Stars, George Johnson, W. W. Norton and Co., 2005, ISBN 0393051285, 162 pp.
Rosalind Franklin: The Dark Lady of DNA, Brenda Maddox, Harper Perennial, 2003, ISBN 0060985089, 416 pp.

Reviewer: Sandra Keith, St. Cloud State University, szkeith@stcloudstate.edu

"I am thought of, therefore I am."
— Annabella Byron

In the flamboyant Regency period, the aristocratic Annabella Milbanke loved to dabble in mathematics and was dubbed by Lord Byron "the princess of parallelograms," but her marriage to the poet resulted in a quick separation; he was rumored to be incestuous with his half-sister Augusta. However, Byron's and Annabella's child Augusta Ada (1815–1852), later Ada Lovelace, was steered by her poetical and mathematical mother into something less provocative than poetry—the mathematics which was then flourishing.

Ada translated Luigi Manabrea's treatise on Charles Babbage's proposed "Analytical Engine." And while she has been credited with being the first programmer, some have dismissed her. As a graduate student in the late '60s, I heard, "there have been only two great women mathematicians in history: one wasn't a mathematician and the other wasn't a woman." Mathematicians can't tell that joke now, but at that time, they could make what they wanted of the second; Ada was surely intended as the first.[1] But Ada translated Manabrea's memoir on Babbage's "Analytical Engine," and added her own ideas. Babbage writes "I … suggested she add some notes to Manabrea's memoir…. We discussed together the various illustrations [programs] that might be introduced: I suggested several but the selection was entirely her own. She also provided the algebraic working out of the different problems, except, indeed, that relating to the numbers of Bernoulli, which I had offered to do to save Lady Lovelace the trouble. This she sent back to me for an amendment, having detected a grave mistake…." Of course, the Analytical Engine with Ada's "programs" was never produced: this cross-gender collaboration went nowhere as a contribution to the development of mathematics and remains visible perhaps only as a fossilized hypothetical.[2]

In Tom Stoppard's play, *Arcadia,* Lady Lovelace is reimagined in the character of the young Regency teenager Thomasina, who naively suggests to her tutor the amazing ideas of recursion and chaos. She is puzzled by the second law of thermodynamics while noticing that jam stirred in her porridge turns the porridge immutably pink, and she carelessly wonders if formulas might not have the power to generate themselves. These Regency scenes coincide and collide on stage in chaotic/recursive manner with present day scenes in which, among other things, a current-day worker studying old Regency letters will observe fractals in Thomasina's connect-the-dots play and recognize (as Thomasina and the world does) that there is a non-Newtonian force to be reckoned with in sex. Thomasina's work will be credited later, but in her world of courtly intrigue in the gazebo, Thomasina never cares about science; she waltzes away with the tutor, and so we need not worry here that Thomasina gets her mathematical due only later by post-collaborative thermodynamical processes in the play.

Arcadia is often compared to the Pulitzer prize-winning play of David Auburn, *Proof.* Now we seriously

[1] The first butt of the joke may have been intended to be Sonya Kovalevsky (the second, Emmy Noether). See http://scidiv.bcc.ctc.edu/Math/Kovalevsky.html to read of Kovalevsky's difficult, school-based training. From the jokester's point of view, the more women it applies to, the better.

[2] An online emulator of the Analytical Engine is available at www.fourmilab.ch/babbage/contents.html.

must ask: Did the lady do it? How was she thought of? And does she care? In this play, and in its movie-elaboration starring Gwyneth Paltrow, the sullen 25 year-old Catherine has either written the proof of the century or is taking the credit from her brilliantly famous mathematician father, who spent the latter part of his life demented and cared for by Catherine. At the beginning of the play he talks with Catherine to remind her of her birthday and his own funeral (we now realize he is dead). He loves to expound on the great flashing brilliance of mathematics that pours from him, and he reminds Catherine to do her mathematics while young (you are dead after 25 is a theme in the play). Catherine had quit college to nurse her ailing father, so her mathematics has largely been learned at home. Meanwhile, a potential love interest, Hal, a graduate student of the formerly functioning father discovers among the papers "the proof"; he has a sly curiosity about the result but must confront Catherine's claim: "I wrote it and so what if you don't believe me." While her attitude undermines her credibility with everyone including the audience, Catherine herself has ceased to care whether we believe her or believe in her; she is verging on depression. Nevertheless, after a flashback or imagining of her father driveling nonsense-mathematics, Catherine jolts. Confessing that hers is just a "connect the dots" effort, not at all typical of her father's brio, she sits down with Hal to collaborate. Catherine and the proof will be sane and safe. (The proof, by the way, concerns Sophie Germain primes, primes p such that $2p + 1$ is prime. Germain lived during the period of Annabella Byron, but it's doubtful their paths would have crossed during the Napoleonic wars.) At the center of *Proof*

NSF-AWM Travel Grants for Women

The objective of the NSF-AWM Travel Grants program is to enable women researchers in mathematics or in mathematics education to attend research conferences in their fields, thereby providing a valuable opportunity to advance their research activities and their visibility in the research community. By having more women attend such meetings, we also increase the size of the pool from which speakers at subsequent meetings may be drawn and thus address the persistent problem of the absence of women speakers at some research conferences. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM.

Travel Grants. Two types of grants are available. The Mathematics Travel Grants provide full or partial support for travel and subsistence for a meeting or conference in the applicant's field of specialization. The Mathematics Education Research Travel grants provide full or partial support for travel and subsistence in math/math education research, for mathematicians attending a math education research conference or math education researchers attending a math conference. In either case, a maximum of $1500 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 (DMS) and the Division of Research, Evaluation and Communication (REC) of the NSF. The conference or the applicant's research must be in an area supported by DMS. Applicants must be women holding a doctorate (or equivalent experience) and with a work address in the USA (or home address, in case of unemployed mathematicians). Anyone who has been awarded an AWM-NSF travel grant in the past two years is ineligible. Anyone receiving more than $2000 yearly in external governmental funding for travel is ineligible. Partial travel support from the applicant's institution or from a non-governmental agency does not, however, make the applicant ineligible.

Applications. An applicant should send *five* copies of 1) the AWM Travel Grant Form, where conference name, conference dates and location (city/state/country), and amount of support requested should be provided, 2) a cover letter, 3) a description of her current research and of how the proposed travel would benefit her research program, 4) her curriculum vitae, 5) a budget for the proposed travel, and 6) a list of all current and pending travel funding (governmental and non-governmental) and the amounts available for your proposed trip to: Travel Grant Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. If you have questions, contact AWM by phone at 703-934-0163 or by e-mail at awm@awm-math.org. Applications via e-mail or fax will not be accepted. There are three award periods per year. The next two deadlines for receipt of applications are **October 1, 2007** and **February 1, 2008**.

is a mystery—trust vs. proof? And lacking the mathematical substance that could validate Catherine and the proof, it is also a tease.

In fact, several prominent reviewers of this play have skipped outside the mathematical box altogether, to see this as a play about sanity, death, and love. Nevertheless the play can resonate with female mathematicians without any references whatever to these themes. Rather, it is a puzzle. The genetics of genius: did she do it or did she imagine/package it? How can the woman mathematician claim her priority as a researcher? Catherine takes the final step in explaining her proof to Hal: collaboration or dependency? Student, daughter, spouse, colleague, beyond?

Auburn, not being a mathematician, can only raise questions, and the movie version he collaborated in writing changes the rules of the puzzle in at times irritating ways. We actually see Catherine finish the proof in her notebook and attempt to show it to her father who is exuberant about his own proof, pushing her to read it. True to gender-type, she puts hers away to read his, only to find it demented ramblings. Catherine locks her book away. In the play, Catherine's activity is sparsely limited to taking care of her father, responding to Hal angrily and lovingly, and spatting with her sister, who has sold her home out from under her. The lengthier movie provides details of a college term, romance, and the clichéd dash through an airport back to Hal. These

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 2007 and Spring 2008. 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, 2008, 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, 2008 for Spring 2008 only if funds remain after the August 2007 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@awm-math.org, or visit www.awm-math.org. Applications must be received by **August 4, 2007**; applications via e-mail or fax will not be accepted.

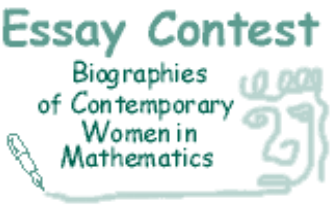
details merely extend the questions, answering nothing.

Did she do it? How was she thought of? Did she care? If *Proof* leaves us with these questions, so do two recent books on women in science in the first half of the twentieth century: *Miss Leavitt's Stars,* by George Johnson, and *Rosalind Franklin: The Dark Lady of DNA,* by Brenda Maddox. Henrietta Leavitt (1868–1921), a Radcliffe graduate, was trained and employed at minimum wage to measure and catalog the brightness of stars in the sequences of photographic plates being collected by the Astronomical Observatory at Harvard. She went on to discover some 2,000 stars. She claimed that "it is worthy of notice" that the brighter variable stars have the longer periods, and since these variables were all the same distance away (same Magellanic Cloud), you could judge a star's "true" brightness by its frequency. This permitted the use of apparent brightness as an indicator of distance and thus created a measurable third dimension for the photographs, opening the way to the understanding of galaxies beyond and more. This discovery suggested a possible Nobel Prize, but her status as a mere "computer" and her family obligations, together with her early death, foreclosed such possibilities, though she has been memorialized in the names of a moon crater and an asteroid.

Rosalind Franklin's (1920–1958) unique skills in photo-crystallographic research on DNA give her a full status as a scientist in the way Henrietta Leavitt was not, but her contribution to the discovery of DNA structure remained fraught with gender-grounded obstructions in Maddox's telling—the administrative problems about her status in the Cambridge Lab and the chauvinistic attitude of James Watson. Once again, a woman's critical contribution to one of the central scientific discoveries in the twentieth century was blocked from recognition proportionate to its importance. Yet Franklin's X-figure photos (no mere computation—a scientific feat in themselves) as a determinant of helical-structure makes her exclusion from Nobel recognition a sad addition to the story of non-acknowledgement. At the same time, it takes us closer to an acknowledgment of the real substance of the work of scientific investigation women at their highest level of achievement and contribution have provided.

They did it, they are now being thought of highly for it, and—on the evidence of these works—increasingly we do seem to care.

Sandra Keith is Professor of Mathematics at St. Cloud State University in Minnesota and was director of the 1989 Conference on Women in Mathematics and the Sciences in St. Cloud.



To increase awareness of women's ongoing contributions to the mathematical sciences, the AWM is (*pending funding*) sponsoring an essay contest for biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers. The essays will be based primarily on an interview with a woman currently working in a mathematical career. This contest is open to students in the following categories: **grades 6–8**, **grades 9–12**, and **undergraduate**.

At least one winning entry will be chosen from each category. Winners will receive a prize, and their essays will be published online at the AWM Web site. Additionally, a grand prize winner will have his or her entry published in the AWM *Newsletter*. For more information, contact Dr. Victoria Howle (the contest organizer) at vehowle@sandia.gov or see the contest Web page: www.awm-math.org/biographies/contest.html. The deadline for receipt of entries is **November 2, 2007**. *(To volunteer as an interview subject, contact Howle at the e-mail address given.)*

Education Column

Answers of the College Board and Others to the Question: Mathematics: What Should Students Know and When Should They Know it?

Mary E. Morley

The College Board recently published standards for middle school and high school mathematics and statistics, *College Board Standards for College Success: Mathematics and Statistics.* As the title indicates, the main purpose of these standards is to detail the knowledge and skills students will need to succeed in college. The College Board's goal in developing these standards is to help states, school districts, and schools provide students with the mathematics and statistics education they will need for success in college, in the workplace, and in civic life.

The College Board is a not-for-profit membership association whose mission is to connect students to college success and opportunity. Founded in 1900, the association is composed of more than 5,200 schools, colleges, universities, and other educational organizations. To develop the College Board standards they brought together a committee of mathematics college faculty, high school teachers, middle school teachers, subject matter experts, teacher education specialists, assessment specialist, and curriculum experts. In the interest of full disclosure, I mention here that I took part in the development of the standards, not as a committee member, but as a College Board content specialist. It took the committee several years of meetings to develop the standards, and I found it a great experience.

The College Board standards consist of four to six standards for each of six courses, two middle school courses and Algebra I, Geometry, Algebra II, and Precalculus. Within a course, each standard represents a collection of curricular material with a unifying theme. A standard is a focal point around which a curriculum can be built. The small number of standards in a course encourages teachers to focus on the primary developmental tasks a student must master during the year. For each standard, the document lists learning objectives that define the concepts and procedures students must learn to meet the standard, and for each learning objective, it gives performance expectations that describe what a student must be able to do to demonstrate that he or she has met the objective. *College Board Standards* includes material normally taught in middle school and high school mathematics courses and also includes a greater focus on data analysis and probability than is currently seen in most classrooms, including a data analysis and/or probability standard in every course.

National models for mathematics and statistics standards are needed. In spite of the fact that almost every state has a set of standards, high school graduation does not guarantee preparation for college-level work. Although more than 75% of high school graduates continue their education within two years of leaving high school, less than half earn a bachelor's degree or higher degree by the age of 30.[1]

In addition to the main version, there are two other versions of the mathematics and statistics College Board standards: a three-year version of the Middle School I and II standards, and a four-year integrated version that can be substituted for the traditional Algebra I, Geometry, Algebra II, and Precalculus sequence in schools teaching integrated mathematics programs. Schools can choose to start with the Middle School I standards in sixth grade and complete Precalculus in eleventh grade, preparing students to take Advanced Placement courses in Calculus or Statistics. Other schools might want to start the three-year version of the middle school standards in sixth grade and complete the four-year high school sequence in twelfth grade, which will prepare students for introductory mathematics and statistics courses in the first year of college. Any combination of the two-year or three-year middle school sequence with the four-year traditional or four-year integrated program is possible.

[1] Clifford Adelman, 1999. *Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment.* Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement. The study is archived at http://www.ed.gov/pubs/Toolbox/index.html.

Hence the standards offer schools considerable flexibility in planning curriculum.

The *College Board Standards for College Success: Mathematics and Statistics* are an answer to the question "What Should Students Learn and When Should They Learn It?" based on preparing students for college. Several other sets of national standards have also been released recently. These standards are not necessarily inconsistent with each other, but they were developed for different, albeit overlapping, purposes.

The National Council of Teachers of Mathematics recently supplemented their well-known standards, *Principles and Standards for School Mathematics,* 2000, with their *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics.* The purpose of the latter document is to start a dialogue about what is most important to teach at different levels, and has as its goal a more coherent, focused curriculum.

The American Statistical Association released *GAISE—Guidelines for Assessment and Instruction in Statistics Education, a Pre-K–12 Curriculum Framework.* The GAISE report outlines a three-level developmental progression for learning statistics in K–12 and provides examples of the types of problems students can be expected to solve at each level. The purpose of the GAISE report is to detail what is required for statistical literacy.

The organization Achieve, Inc. is also developing what they call an Exemplar set of mathematics expectations for grades K–12. Achieve was created by the nation's governors and business leaders in 1996. Achieve, Inc., is a bipartisan, not-for-profit organization that helps states raise academic standards, improve assessments, and strengthen accountability to prepare all young people for postsecondary education, work, and citizenship. Achieve is developing their standards by "backmapping" their end-of-high-school math expectations (from their American Diploma Project) to articulate a progression of knowledge and skills from kindergarten.

The Center for the Study of Mathematics Curriculum, an NSF Center for Learning and Teaching, recently sponsored a national conference in Arlington, Virginia, entitled "K–12 Mathematics: What Should Students Learn and When Should They Learn It?" The conference featured presentations on the four mathematics curriculum recommendations mentioned above. The conference involved users of standards—state and district curriculum specialists, textbook and assessment publishers, K–12 district and teacher leaders, and representatives from higher education and business—in discussions about implications for their work. The conference was webcast, and an archive of that webcast is available at http://mathcurriculumcenter.org/MathStandardsConference/ along with links to all of these standards. If you are interested in K–12 education, I would encourage you to visit this site.

Joint International Meeting

The first joint meeting of the American Mathematical Society (AMS) and the New Zealand Mathematical Society (NZMS) will be held at the Victoria University of Wellington, New Zealand, December 12–15, 2007. The meeting, organized by representatives of both societies, will include plenary speakers from each society and will incorporate the 2007 New Zealand Mathematics Colloquium.

The plenary speakers are Marston Conder (University of Auckland), Rodney G. Downey (Victoria University of Wellington), Michael H. Freedman (Microsoft Research), Gaven J. Martin (Massey University), Assaf Naor (Courant Institute of Mathematical Sciences), Theodore A. Slaman (University of California, Berkeley) and Matthew J. Visser (Victoria University of Wellington). There are fourteen Special Sessions confirmed to date.

Since the AMS's first joint international meeting with the London Mathematical Society in 1992, the AMS has co-sponsored 20 meetings with sister societies in their host countries (upcoming in 2007 are meetings in Warsaw, Poland, and Wellington, New Zealand). International meetings are a valuable addition to the Society's programs that foster contacts and collaborations.

For up-to-date information on the program, timetable, accommodations and more, see the website maintained by the local organizers at http://www.mcs.vuw.ac.nz/%7Emathmeet/amsnzms2007/index.shtml.

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Tufts University, Medford, MA
Tulane University, New Orleans, LA
United States Naval Academy, Annapolis, MD
University of Alaska, Anchorage
University of Arizona, Tucson
University of California, Davis
University of California, Los Angeles
University of California, Riverside
University of California, San Diego
University of California, Santa Barbara
University of Cincinnati, Cincinnati, OH
University of Colorado, Boulder
University of Connecticut, Storrs
University of Dayton, Dayton, OH
University of Delaware, Newark
University of Georgia, Athens
University of Hawaii, Manoa, Honolulu
University of Houston, Houston, TX
University of Illinois, Chicago
University of Iowa, Iowa City
University of Kansas, Lawrence
University of Kentucky, Lexington
University of Maryland, College Park
University of Massachusetts, Lowell
University of Michigan, Dearborn
University of Minnesota–Duluth
University of Missouri, Columbia

University of Missouri, Rolla
University of Montana, Missoula
University of Nebraska at Omaha
University of Nebraska, Lincoln
University of New Hampshire, Durham
University of North Carolina, Chapel Hill
University of North Texas, Denton
University of Northern Colorado, Greeley
University of Northern Iowa, Cedar Falls
University of Notre Dame, Notre Dame, IN
University of Oklahoma, Norman
University of Oregon, Eugene
University of Pennsylvania, Philadelphia
University of Pittsburgh, Pittsburgh, PA
University of Puget Sound, Tacoma, WA
University of San Diego, San Diego, CA
University of Saskatchewan, Saskatoon
University of South Carolina, Aiken
University of South Carolina, Columbia
University of Southern California, Los Angeles
University of Tennessee, Knoxville
University of Tennessee, Chattanooga
University of Texas, Austin
University of Utah, Salt Lake City
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University of Waterloo, Waterloo, Ontario
Utah State University, Logan
Vanderbilt University, Nashville, TN
Vassar College, Poughkeepsite, NY
Virginia Tech, Blacksburg, VA
Villanova University, Villanova, PA
Wake Forest University, Winston-Salem, NC
Washington State University, Pullman
Wayne State University, Detroit, MI
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Westminster College, New Wilmington, PA
Williams College, Williamstown, MA
Wright State University, Dayton, OH
Yale University, New Haven, CT
York University, North York, Ontario

Women for Science

InterAcademy Council, May 31, 2007

The Board of the InterAcademy Council has unanimously passed a resolution affirming its commitment to increased participation of women in science, engineering, and health professions. The resolution states that "gender issues relevant to study topics will be included within the scope of IAC studies, giving close attention to gender aspects within reports produced. The IAC will strive to increase female participation in study panel memberships. The IAC will foster increased opportunities for women in employment of Secretariat and consultative personnel."

This resolution follows the June 2006 release of the third IAC report, *Women for Science,* at a publication release event hosted by the French Academy of Sciences in Paris.

That advisory report is addressed primarily to the world's academies. Given their prestige and alliances with governments, universities, and nongovernmental organizations, academies should play advocacy and leadership roles beyond their own doors, the report says. Academies should support the higher education of women in science, engineering, and industrial management while advising governments to remove barriers to their education and employment. Furthermore, they must help to empower in S&T arenas not only professional women but also women at the grassroots level in the developing world. Academies should help establish and promote science and technology "knowledge centers," where women scientists and engineers can work with grassroots women of their own culture on technologies for local needs and applications, thus enabling science and technology capacity building.

Ed. Note: The report *Women for Science* was discussed extensively and favorably in Barbara Keyfitz's presidents report in the September–October 2006 issue of this newsletter.

Math, Science and U.S. Competitiveness

America Competes Act

U.S. Senate Committee on Energy and Natural Resources, April 26, 2007

U.S. Senators Jeff Bingaman and Pete Domenici, the chairman and ranking member of the Senate Energy and Natural Resources Committee, today said they are pleased the Senate has given its strong support to ir legislation designed to make America more competitive globally.

Bingaman and Domenici, along with Majority Leader Harry Reid (D-Nev.), Republican Leader Mitch McConnell (R-Ky.) and others introduced the *America COMPETES Act* last month. It passed the Senate today, 88–8.

"This is a comprehensive approach to ensuring America remains competitive in the global marketplace. It not only invests in the kind of basic scientific research and development that will yield the next big technological discoveries, it also ensures that we are preparing the next generation of American scientists, mathematicians and engineers. This landmark piece of legislation will have a huge impact on our nation's future. I hope we can get the bill through the House of Representatives quickly so we can get it to the president's desk," Bingaman said.

"I'm pleased that such a large, bipartisan group of Senators have voted in favor of this legislation to make America more competitive. It has taken us over a year to get this bill through the Senate, but the need to make sure our nation harnesses the brainpower we need to compete in the global marketplace is now even greater than ever. I look forward to working with the House to put together a final package that will utilize our national labs and other resources to better educate our young people and reclaim our leadership in developing science and technology," Domenici said.

The America Competes Act would double the authorized funding for the National Science Foundation in five years and sets the Department of Energy's Office of Science on a path to double over 10 years. It creates an Innovation Acceleration Research Program to encourage federal agencies to set aside 8 percent of research and development funding for high-risk, high pay-off research.

It also creates science magnet schools whereby each national laboratory "adopts" a school to strengthen its math and science capability. And it creates a broad range of programs to train teachers in math and science education through the Department of Education and Department of Energy while encouraging student participation in advanced placement and international baccalaureate programs.

The bill makes a concerted effort to involve DOE's national laboratories by establishing training and education programs at summer institutes hosted by the labs and by creating partnerships between labs and high schools to build centers of excellence in math and science education.

House Clears Bills Aimed at Boosting U.S. Competitiveness

Committee on Science and Technology, U.S. House of Representatives, April 24, 2007

The U.S. House of Representatives today cleared two bills that comprise key components of the Democrats' Innovation Agenda aimed at strengthening U.S. basic research and at improving and supporting the national corps of math and science teachers.

H.R. 362, the "10,000 Teachers, 10 Million Minds" Science and Math Scholarship Act and H.R. 363, Sowing the Seeds through Science and Engineering Research Act, cleared the House today by wide bipartisan margins.

The bills were both authored by Rep. Bart Gordon (D-TN), Chairman of the House Science & Technology Committee. They are based upon the recommendations of the National Academies' widely-acknowledged report *Rising Above the Gathering Storm,* which found that the U.S. stands to lose its competitive edge in the international economy unless immediate action is taken.

"That report told us that now is the time to take bold steps to ensure that our children are prepared for the jobs of the future and that our nation can continue to compete in the global economy," said Chairman Gordon.

H.R. 362, the "10,000 Teachers" bill would:

- Establish programs at universities to recruit strong students majoring in science, mathematics, and engineering into careers in teaching; to provide these students with specialized education courses incorporating best practices for teaching science and math; and to provide scholarships for program participants of $10,000 per year;
- Provide in-service training to math and science teachers to improve content knowledge and teaching skills via specially tailored master's degree programs and summer institutes; and
- Expand existing programs at universities designed to expand the pool of undergraduate students who will become the next generation of scientists, technologists, engineers, and mathematicians.

Chairman Gordon offered an amendment to the bill that would establish public-private partnerships to entice professionals in science or engineering to enter teaching as a second career through stipends to obtain teaching certification and salary supplements provided by the private sector partners for their first four years in teaching. The amendment was accepted.

H.R. 363, the "Sowing the Seeds" bill would:

- Provide grant awards through the National Science Foundation and Department of Energy to support outstanding early-career researchers in academia and in nonprofit research organizations;
- Provide graduate research assistantships in multidisciplinary fields of national need;
- Establish a presidential innovation award to stimulate scientific and engineering advances in the national interest; and
- Establish a national coordination office to prioritize university and national research infrastructure needs.

"Ultimately, these bills and ones like it that are part of the Democrats' Innovation Agenda are designed to provide high quality jobs for hard working Americans and ensure that our children are ready for those jobs—that's what economic competitiveness and stability for generations to come is all about," said Gordon.

"Innovation is not just a goal, it is a necessity, and one of the first steps we need to take is to invest in scientific education and research along these lines," Gordon said. "That investment is necessary if America is to maintain its position as a global leader in technology and innovation. These bills are part of a framework that will get us there."

The Science and Technology Committee has jurisdiction over all civilian, non-military research and development programs.

Ed. note: It is expected that the Senate and the House will reach agreement on compromise legislation and that the result will be signed into law by President Bush.

Urry Named Physics Chair

Yale University, January 2007

Yale President Richard C. Levin has announced that C. Megan Urry, Israel Munson Professor of Physics and Astronomy, will serve as Chair of the Department of Physics for a term of three years, effective July 1, 2007.

Urry, the first woman chair in physics at Yale, has earned renown both for her research on super-massive black holes and for her efforts to expand the options for and increase the number of women and minorities in the physical sciences.

Since Urry arrived at Yale in 2001, she has developed two large collaborative research projects with Chilean astronomers and designed new courses to introduce undergraduates to the physical sciences. She has also been instrumental in encouraging Yale students through the Women Faculty Forum mentoring program and in introducing science to young people in the New Haven area through her participation in the Science Saturdays program.

Urry's scientific research concerns active galaxies—i.e., galaxies with unusually luminous cores powered by very massive black holes. Her group has carried out extensive observations of these objects in order to understand their energetics, structure and evolution. Her current interests include the mass function of black holes and the co-evolution of active and normal galaxies.

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

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

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

WHEN: The next AWM Workshop to be held in conjunction with the Joint Mathematics Meetings will take place in San Diego, CA, January 6–9, 2008 (Sunday–Wednesday). The Workshop is scheduled to be held on Wednesday, January 9, with an introductory dinner/discussion group on Tuesday evening, January 8.

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 toward 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 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 Web site.

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

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

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

APPLICATION DEADLINE

Applications must be received by **August 31, 2007**. Applications via e-mail or fax will not be accepted.

Alcoa Grant to MentorNet

MentorNet, April 2007

Alcoa Foundation has provided a $25,000 grant to MentorNet, a Silicon Valley-headquartered nonprofit that links students and professionals in scientific and technical fields across the globe. The grant is enabling MentorNet particularly to reach out to organizations and staff working with minority students and professionals in engineering and science to build awareness of the opportunities to participate in MentorNet programs. Among other activities, a series of webconferences will introduce more college and university-based diversity advocates to MentorNet programs.

Recognized as an organization that effectively uses a network to create sustainable, competitive differentiation in the marketplace, MentorNet, The E-mentoring Network for Diversity in Engineering and Science, works in close partnership with more than 100 institutions of higher education across the U.S., as well as several in locations around the world. Its programs rely entirely on e-mail and the internet to support one-on-one mentoring relationships for thousands of students and professionals in engineering and science in the U.S. and 59 countries.

"With support from grants such as Alcoa Foundation's, MentorNet is better able to respond in particular to the interests of people of color who are currently underrepresented in engineering and science, and the communities which serve them," said Carol Muller, MentorNet's founder and chief executive officer. "Thanks in part to the support from this grant, the numbers of people of color underrepresented in engineering and related sciences—African Americans, those of Hispanic/Latino/a heritage, and Native Americans—participating in our One-on-One program this year have increased by more than 60%, for both participating students and professionals."

For more information about becoming a mentor or protégé; involving a specific college, university, corporation, government lab, or professional society; or how MentorNet's programs work, please visit www.MentorNet.net.

Call for Nominations: The 2008 Kovalevsky Prize Lecture

AWM and SIAM established the annual Sonia Kovalevsky Prize Lecture to highlight significant contributions of women to applied or computational mathematics. This lecture is given annually at the SIAM Annual Meeting. Sonia Kovalevsky, whose too-brief life spanned the second half of the nineteenth century, did path-breaking work in the then-emerging field of partial differential equations. She struggled against barriers to higher education for women, both in Russia and in Western Europe. In her lifetime, she won the Prix Bordin for her solution of a problem in mechanics, and her name is memorialized in the Cauchy-Kovalevsky theorem, which establishes existence in the analytic category for general nonlinear partial differential equations and develops the fundamental concept of characteristic surfaces.

The mathematicians who have given the prize lecture in the past are: Linda R. Petzold, Joyce R. McLaughlin, Ingrid Daubechies, Irene Fonseca, and Lai-Sang Young.

The lectureship may be awarded to anyone in the scientific or engineering community whose work highlights the achievements of women in applied or computational mathematics. The nomination must be accompanied by a written justification and a citation of about 100 words that may be read when introducing the speaker. Nominations should be sent to the AWM office (*five* copies to: Kovalevsky Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030; phone: 301-405-7892) or electronically to awm@awm-math.org, to arrive by **November 1, 2007**.

The awardee will be chosen by a selection committee consisting of two members of AWM and two members of SIAM. Please consult the award web pages www.siam.org/prizes/kovalevsky.htm and www.awm-math.org/kovalevskylectures.html for more details.

AWM Workshop for Women Graduate Students and Postdocs 2007 SIAM Dynamical Systems Meeting in Snowbird, Utah

Past AWM President Barbara Keyftiz and Kovalevsky Lecturer Lai-San Young

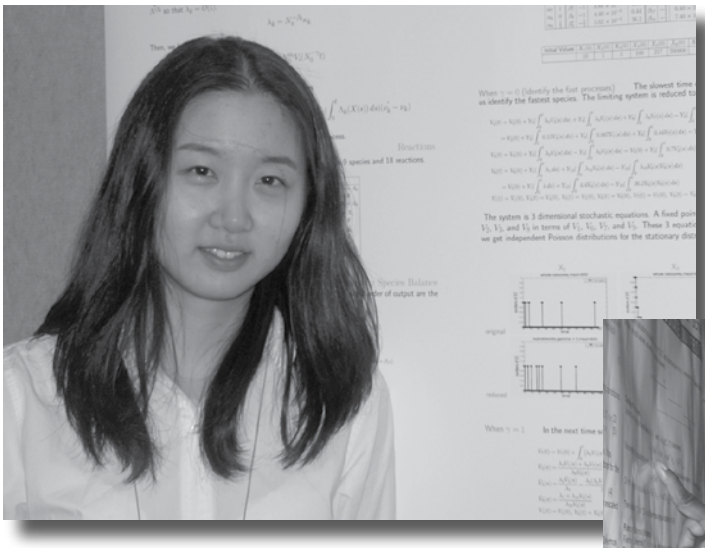
Poster Session—from left to right: Chad Topaz, Anna Catlla, Jessica Conway, Sue Ann Campbell

Left: Janet Scheel, California Lutheran University

Left to right: Maya Minchera, University of ???, Madison; Mihaela Presdescu, Berkeley College; Christina Hayes, Gettsburg College; and Anna Catlla, ??? University

Above: Anna Catlla, ??? University

Left: Luz Vela-Arevalo, Georgia Tech University



Left: Vera Mikyoung Huv, Massachusetts Institute of Technology

Websites of Interest

Career Cornerstone Center

The Sloan Career Cornerstone Center is a non-profit resource center for those exploring career paths in science, technology, engineering, mathematics, computing, and medicine. Support from the Alfred P. Sloan Foundation has made the resources at www.careercornerstone.org possible. The site is very well-written and informative, with resources for students, counselors, teachers, parents and graduates. A free newsletter is available, and there are podcasts and videos related to many topics.

The overview page for mathematics begins: "Mathematics is one of the oldest and most fundamental sciences. Mathematicians use mathematical theory, computational techniques, algorithms, and the latest computer technology to solve economic, scientific, engineering, physics, and business problems. The work of mathematicians falls into two broad classes—theoretical (pure) mathematics and applied mathematics. These classes, however, are not sharply defined and often overlap. The world is full of places to do rigorous mathematics. As you begin to identify potential outlets for your talent, it may be useful to get a sense of the dimensions of the 'field' in its entirety." The page goes on with links to preparation, day in the life, application, earnings, employment … you get the picture! One of the links is to profiles of mathematicians, showcasing interesting careers held by students with highest degree at the bachelor's, masters, and Ph.D. levels.

One of those profiled is Bonita Saunders, Ph.D. in mathematics, Old Dominion University, whose current position is mathematician at the National Institute of Standards and Technology. From the video transcript: "One thing I've noticed since I've been in my position is that I've used just about all the math I've learned. I can't say that there's anything I've taken, any math course I've taken that was completely irrelevant. It just seems like sooner or later, everything is important. And that's sort of a surprise to me. And the other thing that's a big surprise, when you get into the working world, not just here, but any type of job, is how important communication is. I actually worked in private industry for a few years before I came to NIST. It was really surprising how important it was to be able to write well, to speak well, to communicate your ideas. And I think if one thing is underemphasized in school it's that you really need the ability to write well and communicate well for any job you're in." For the remainder of her profile, see www.careercornerstone.org/math/profiles/saunders.htm.

Scitopia.org

AIP, April 2007

The American Institute of Physics (AIP) has joined with twelve of the world's leading science and technology societies to create more direct access to their collective content. In June, the group launched scitopia.org, a free federated vertical search portal that will enable users to explore the research most cited in scholarly work and patents in a single click.

Scitopia.org aggregates the entire electronic libraries of the leading voices in major science and technology disciplines. More than three million documents spanning 150 years of science and technology, including peer-reviewed journal content and conference proceedings, may be searched through this dedicated gateway. Founding partners include: American Geophysical Union (AGU), American Institute for Aeronautics and Astronautics (AIAA), American Institute of Physics (AIP), American Physical Society (APS), American Society of Civil Engineers (ASCE), American Society of Mechanical Engineers (ASME), The Electrochemical Society (ECS), IEEE , Institute of Physics Publishing (IOP), Optical Society of America (OSA), SPIE, Society of Automotive Engineers (SAE) and Society for Industrial and Applied Mathematics (SIAM). Other organizations will be invited to join as the project progresses.

Visitors to scitopia.org will be presented with a simple but function-rich interface. Search results will include the article's title, authors and citation. Once a piece of content is selected, the user will be directed to the publisher's digital library site to access the full text. Researchers at institutions with subscriptions to the content will be automatically authenticated and will be able to click through to it. Members of partner societies may also be able to access full text, depending upon the association's membership policies. Pay-per-view options will allow others to purchase as many articles as they choose.

ADVERTISEMENTS

AWM Executive Director

The Association for Women in Mathematics is seeking applicants for the position of Executive Director. The AWM is dedicated to achieving full participation and equity for women and girls in the mathematical sciences. In support of this mission, AWM seeks to promote awareness and recognition of women's achievements in the mathematical sciences, to administer programs that encourage women and girls, and to build community among all mathematical scientists.

This position requires a Ph.D. in the mathematical sciences. The successful candidate will be expected to represent the AWM at mathematics conferences and to be responsible, together with the AWM Managing Director, for administrative activities supportive of the mission and programs of the organization. Excellent writing skills and organizational expertise are essential. The Executive Director will also work closely with the AWM President and Executive Committee.

We seek an outstanding individual who is passionate about supporting women in mathematics. This is a part-time position that can be combined with an existing academic appointment (e.g., via course reduction). The AWM office is in the DC area, but the geographic base of the Executive Director can be anywhere in North America.

A letter of application, contact information for at least three people who have agreed to serve as references, and a curriculum vitae should be submitted to mathjobs (http://www.mathjobs.org/jobs). Review of applications will begin immediately, and will continue until the position is filled. The letter of application should include a description of why the candidate is well-suited for this position and how this position fits with the candidate's current career trajectory. Date of availability should be indicated, together with any special considerations.

For more information about AWM, please visit our Web site at: http://www.awm-math.org/

Questions about this position should be directed to AWM President Cathy Kessel (cbkessel@earthlink.net).

YALE UNIVERSITY — Arithmetic Algebraic Geometry and L-functions — The Department of Mathematics of Yale University invites applications for a position as a tenured Associate or Full Professor in the area of Arithmetic Algebraic Geometry and L-functions. We seek scholars with a record of outstanding achievement in research who are accomplished teachers at both the undergraduate and graduate level. We are interested in candidates with a breadth of expertise in the above mentioned area. Please send curriculum vitae, description of research interests, and at least three letters of recommendation by **July 2, 2007**. Department of Mathematics, Yale University, P.O. Box 208283, New Haven, CT 06520-8283, Attn: Search Committee, Arithmetic Algebraic Geometry and L-functions. Yale University is an Affirmative Action/Equal Opportunity Employer. Applications from women and underrepresented minority scholars are especially encouraged.

YALE UNIVERSITY — Dynamical Systems and Ergodic Theory — The Department of Mathematics of Yale University invites applications for a position as a tenured Associate or Full Professor in the area of Dynamical Systems and Ergodic Theory. We seek scholars with a record of outstanding achievement in research who are accomplished teachers at both the undergraduate and graduate level. We are interested in candidates with a breadth of expertise in the above mentioned area. Please send curriculum vitae, description of research interests, and at least three letters of recommendation by **July 2, 2007**. Department of Mathematics, Yale University, P.O. Box 208283, New Haven, CT 06520-8283, Attn: Search Committee, Dynamical Systems and Ergodic Theory. Yale University is an Affirmative Action/Equal Opportunity Employer. Applications from women and underrepresented minority scholars are especially encouraged.

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CATEGORY 2b (includes 6 student membership; 10% off Newsletter & online ads)	$150

For further information or to join at these levels, see www.awm-math.org.

2007-2008 Individual Membership Form

JOIN ONLINE at www.awm-math.org!

AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

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CITY _____ STATE _____

ZIP/POSTAL CODE _____ COUNTRY _____

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

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

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

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

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

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☐ REGULAR INDIVIDUAL MEMBERSHIP.	$ 55	_____
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☐ CONTRIBUTION to the "AWM ALICE T. SCHAFER PRIZE"	$	_____
☐ CONTRIBUTION to the "AWM ANNIVERSARY ENDOWMENT FUND"	$	_____

Dues in excess of $15 and all cash contributions are deductible from federal taxable income when itemizing.

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AWM

Volume 37, Number 4, July–August 2007

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or E-MAIL:

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