President's Report

Dear Colleagues:

I was pleased to discover that Judy Green and Jeanne LaDuke's *Pioneering Women in American Mathematics: The Pre-1940 Ph.D.'s* will be published jointly by the American Mathematical Society and the London Mathematical Society in January. Congratulations to Judy and Jeanne! Their book, together with Margaret Murray's *Women Becoming Mathematicians: Creating a Professional Identity in Post–World War II America,* will give us a detailed picture of the U.S. women who earned Ph.D.'s in mathematics before 1959.

If you want a sense of what happened after 1959, there is Pat Kenschaft's *Change is Possible: Stories of Women and Minorities in Mathematics* or Bettye Anne Case and Anne Leggett's *Complexities: Women in Mathematics.* These are quite different books, but have some common features. Both include excerpts from past issues of the AWM *Newsletter* and discuss the two-body problem and solutions, and events close to 2005, the year in which both were published.

Returning to 2008…you may recall that the National Mathematics Panel finished its report on K–8 mathematics education in March. As Bill McCallum, chair of the AMS Education Committee, pointed out in his testimony to the panel, "the general record of follow-up on these reports is a sorry one." He suggested a series of follow-up meetings to "mine the work of the panel and extract nuggets around which to build their own agendas for action and programs for research." In October, I attended one such meeting, the National Math Panel Forum, organized by the Conference Board of the Mathematical Sciences.

Types of organizations represented included CBMS member societies (e.g., AMS, ASL, MAA, NAM, SIAM), colleges and universities, state departments of education, school districts, non-profits (e.g., Achieve and College Board), and major textbook publishers (e.g., McGraw-Hill, Pearson Publishing). More

IN THIS ISSUE

details about the meeting, including action plans from organizations that sent teams, appear on the CBMS web site.

The Forum focused on four of the seven areas in which the National Mathematics Panel makes recommendations:

- Teachers and Teacher Education
- Learning Processes
- Instructional Materials
- Standards of Evidence—Research Policies and Mechanisms

In my opinion, of the recommendations in these four areas, Learning Processes recommendations 13 and 14 are particularly relevant to AWM. However, their relevance may not be immediately obvious from their wording:

> 13. Mathematics performance and learning of groups that have traditionally been underrepresented in mathematics fields can be improved by interventions that address social, affective, and motivational factors. Recent research documents that social and intellectual support from peers and teachers is associated with higher mathematics performance for all students, and that such support is especially important for many African-American and Hispanic students....

> 14. Children's goals and beliefs about learning are related to their mathematics performance. Experimental studies have demonstrated that changing children's beliefs from a focus on ability to a focus on effort increases their engagement in mathematics learning, which in turn improves mathematics outcomes: When children believe that their efforts to learn make them "smarter," they show greater persistence in mathematics learning.... [An increased emphasis on the importance of effort] is a critical point because much of the public's self-evident resignation about mathematics education...seems rooted in the erroneous idea that success is largely a matter of inherent talent or ability, not effort.

Results from the experimental studies mentioned are described in the Learning Processes Task Group Report (which may be downloaded from the Math Panel web site). For example, one study "showed that students who viewed their intelligence as a fixed trait fared more poorly across the transition to junior high than did their peers who believed their intelligence was malleable and could be developed.... The superior performance of students who believed that intelligence is malleable was mediated by their greater emphasis on learning, their greater belief in the importance of effort, and their more mastery-oriented reactions to setbacks." Moreover, students' views of intelligence and learning can be changed—in ways that result in improvements in their learning of mathematics.

Why is this relevant for AWM? Because views of intelligence can affect mathematical performance—and the presence or absence of gender or racial gaps in test scores. This and related findings were discussed in the psychologist Joshua Aronson's talk for "Promoting Diversity at the Graduate Level in Mathematics: A National Forum" at the Mathematical Sciences Research Institute in Berkeley. Its many interesting talks and panels are available as videos via the MSRI web site. Aronson's talk "Low Numbers: Stereotype Threat and the Performance of Women and Minorities" was very well received, and I encourage you to watch the video if you were not present at the workshop.

Early in the talk is a statement about a gender gap emerging on standardized tests in middle school. Given the well-publicized results of Hyde et al.'s "Gender Similarities Characterize Mathematics Performance" in July, I was curious about the evidence for these gaps. Professor Aronson was kind enough to provide a reference. The Early Childhood Longitudinal Study followed a group of students who entered kindergarten in fall 1998 until spring 2004, when most were in fifth grade. Its findings are summarized in NSF's *Science and Engineering Indicators, 2008* which says, "Boys and girls started kindergarten at the same overall mathematics performance level…but by the end of fifth grade, boys had made larger mathematics gains than girls, resulting in a small but observable gender gap of four points"—out of a possible total of 153 points.

October was an eventful month. Between the National Mathematics Forum and the MSRI workshop, "Cross-cultural Analysis of Students with Exceptional Talent in Mathematical Problem Solving" appeared in the electronic version of the *Notices of the American Mathematical Society.* (Two of its four authors are Janet Mertz, professor of oncology and one of the Falconer lunchers whose picture appears in the preceding issue of the newsletter, and Joe Gallian, president of MAA, whose name appears in thanks from numerous Schafer winners.) This study documents the wide variation in the number of girls on top-scoring International Mathematics Olympiad teams. It also documents the education and country of origin of students who earn top scores in U.S. mathematics competitions, noting that many of these students are immigrants from Asia and Eastern Europe.

AWM

Media coverage of this study, including an article in the *New York Times,* was considerable, but not quite as extensive as that for Hyde et al.'s *Science* article, published in July. The *Science* study, as you may recall, analyzed effect size (normed difference in average scores) and the ratio of variances of boys' and girls' scores on state tests. Interestingly, many of the newspapers and blogs which focused on the greater variability of white (but not Asian) boys' scores in the *Science* study did not discuss the variability in the number of girls on top-scoring Olympiad teams from different countries. In fact, they didn't discuss the *Notices* study at all.

Could this lack of attention be due to discomfort with its findings? Like intelligence or mathematical ability, in North America greater male variability in intellectual attributes seems attributed to entirely genetic causes. However, beliefs about intelligence and ability, like the number of girls on Olympiad teams, may vary by country. In a very interesting book chapter posted on her web site, "Women at the Top in Science—and Elsewhere," the psychologist Virginia Valian comments that the U.S. educational system as a whole acts as if mathematical ability is unchangeable. In contrast, the Japanese educational system acts as if mathematical ability can be increased.

My own hunch is that national views of mathematical ability and teaching ability play out in policies about schools, teaching, and teacher education. If "good teachers are born, not made," then perhaps teachers don't need to be helped to learn their profession and won't benefit from sharing information with other teachers. If students come in two immutable categories—the "math minds," who need not work hard, and the rest—then one mustn't expect much from the latter. The "math geniuses" will "get it" anyway and the cream will rise to the top.

In contrast, other countries show some remarkable differences from the U.S. in their educational practices. Some devote more time and more collective knowledge in creation of textbooks, teachers guides, and other curriculum documents. For example, Japanese teachers guides support teachers by describing how students' conceptions may change in response to specific textbook exercises. Another difference is the care and frequency with which curriculum topics are explicitly connected with each other in textbooks. Under these circumstances, the payoff for effort—from teachers as well as students—may be more obvious, reinforcing the belief that effort makes a difference.

My experiences as president of AWM have convinced me that AWM creates circumstances that help ability to be recognized and effort to make a difference. One of the newest of these programs is the Ruth I. Michler Memorial Prize. At the end of October, I had the good fortune to attend the 2008 Michler prize winner Irina Mitrea's talk "Boundary-Value Problems for Higher-Order Elliptic Operators" at Cornell University. I was impressed to find out that she is not only a remarkable researcher, but has been very active with pre-college students as a coach for mathematics competitions

and as an organizer of Sonia Kovalevsky High School Days and summer programs for girls. Rebecca Goldin, the 2007 Michler prize winner, is also a remarkable researcher with a second string to her bow. The latter was evident in her 2008 Falconer Lecture and MAA Distinguished Lecture on the use and misuse of statistics in the media.

This will be my last president's report, and thanks are due in many quarters. First of all, I would like to thank all who have served on committees, as workshop organizers, and as mentors—without you, AWM's programs would not exist. Presidents and staff of AMS, ASL, MAA, NCTM, and CBMS have contributed in many different ways. I am grateful to everyone who has taken the time to tell me about something—the effect of a workshop, a mistake on the web site, information that AWM might provide or should know.

Thanks to all who have written newsletter articles or brought articles to the attention of the editor—without you, the newsletter would not reflect AWM's collective experience and wisdom. Due to Marge Bayer, the book review editor since 2003, we've had reviews of books that range from *The Science Education of American Girls* to *The Two-body Problem.* Ginger Warfield, who has been in charge of the education column since 1998, now maintains it together with Jackie Dewar, Abbe Herzig, Pat Kenschaft, and Mary Morley.

Like many things, I think being a president is a matter of effort as well as aptitude, nurture as well as nature. I've had a wide variety of support from a wide variety of people. When I began as president, Jenny Quinn was the executive director. She was wonderfully helpful, not only in doing her job, but also with the transition after she resigned. In the interim, Jennifer Lewis, the AWM managing director, helped to fill the gap between executive directors in important ways—while maintaining the AWM office. I am indebted to the wisdom and energy of the search committee, who decided upon Maeve McCarthy. Maeve has learned about AWM's many programs, grants, proposals, and other moving parts with amazing speed and has begun to improve operations. I am grateful to all three for their advice, skill, and hard work.

Thanks to all the members of the Executive Committee. Holly Gaff, the web editor, has maintained the web site with efficiency and good humor. As clerk, Maura Mast has recorded the Executive Committee's bi-monthly meetings. Our treasurer, Rebecca Herb, been responsible for our budget and patiently answered questions from me. Bettye Anne Case, who has been the meetings coordinator since 1983, has shared her accumulated wisdom about meetings, both in the U.S. and abroad. In addition to editing the newsletter (which she has done since 1977), Anne Leggett has been generous in sharing her encyclopedic knowledge of AWM and its workings.

AWM's past presidents have helped in countless ways, large and small. Some have served on committees and given the benefit of their experience. Some have helped me with details of AWM history or operations. Some have drawn my attention to a piece of news or funding opportunity. It's been a joy and an inspiration to work with my predecessor Barbara Keyfitz and my successor Georgia Benkart. I feel very fortunate to have been president of AWM.

Cathy Kessel
Berkeley, CA
December 2, 2008

Call for Suggestions

In December 2009 we will be electing the following officers: President-Elect, Clerk and four At-Large Members. Suggestions for candidates may be made to Georgia Benkart or Cathy Kessel by *February 15, 2009*; they will pass them along to the Nominating Committee. Your input will be appreciated! Barbara Keyfitz, recent AWM president, will serve as chair of the Nominating Committee.

Marcia P. Sward (1939–2008)*

Linda Rosen

The mathematics community lost a champion and a friend with the death of Marcia Peterson Sward on September 21, 2008. She died with dignity and grace from kidney cancer that was diagnosed just weeks before her death.

Marcia served as the first Associate Executive Director of the Mathematical Association of American (MAA) between 1980 and 1985. She returned to the MAA as Executive Director in 1989. Between her two periods at the MAA, she served as the Executive Director of the Mathematical Sciences Education Board (MSEB) at the National Research Council of the National Academy of Sciences.

Marcia graduated summa cum laude and first in her class at Vassar College with a degree in mathematics. She and her husband of one year, Gil Sward, each pursued graduate study in mathematics at University of Illinois at Urbana-Champaign. Although she was one of the few females in the program, Marcia approached her work with zest and dedication. Under Edward Scott, Marcia was awarded her Ph.D. in 1967 for her dissertation, *The Mixed Boundary Value Problem along the Line of Parabolicity for a Certain Class of Hyperbolic Partial Differential Equations.*

After graduation, Marcia spent a year at Catholic University in Washington, DC as a housemother while job hunting. She began her academic career at Trinity College, also in Washington, DC. Although she loved teaching, Marcia was always looking for new causes to wrestle and new heights to scale. She accepted a one-year visiting appointment at the National Highway Traffic Safety Administration, where she began to hone her executive and management skills.

At that time, the MAA was creating a new position for an Associate Executive Director that would, among other tasks, direct publication of the organization's three journals and create a newsletter to serve members' needs. Intrigued by the possibility of combining her love of mathematics, her dedication to helping young people learn, and her leadership skills, Marcia applied for the job. To get a feel for the place, Marcia decided to hand-deliver a cover letter for her application early on the morning of her interview. To her surprise, there

Marcia P. Sward

was a man sitting alone on the doorstep, waiting for the building to open. She had to explain her somewhat unorthodox behavior, only to learn that she was talking to Don Kreider, the chair of the search committee for her position! It was no surprise that her drive, talent and contagious enthusiasm led to a job offer as the first MAA Associate Executive Director.

Employing paper, red pencil, and a typewriter, she managed to bring out the first issue of *FOCUS* in March 1981. The debut of *FOCUS* "was worth waiting for," Ralph Boas (Northwestern University) later wrote. "You are setting a high standard for yourself." Marcia served as editor of *FOCUS* until September 1985, when she left the MAA.

As her next professional venture, Marcia agreed to become the first Executive Director of the MSEB, which was established by the National Research Council in response to the David report, "Renewing U.S. Mathematics: Critical Resource for the Future." This was a risky venture. There was seed money from the National Research Council (NRC) to keep the organization afloat for only a year, and its mandate was proactive, unlike other groups within the NRC. Working with Kenneth Hoffman (then the director of the Joint Policy Board for Mathematics Office of Governmental and Public Affairs) and Shirley Hill (Past-President of the National Council of Teachers of Mathematics), Marcia convened a stellar advisory board and raised sufficient funds to see the MSEB grow enormously in influence. The seminal report "Everybody Counts: A Report to the Nation on the Future of Mathematics Education" remains to this day a key resource for K–12 mathematics education.

Under Marcia's tutelage, the MSEB served as a focal point for the mathematical community on issues related to K–12 teaching and learning of mathematics. I was Associate Executive Director of MSEB and remember that Marcia displayed acumen, an incredible work ethic, talent for collaboration, passion for the cause, and an unwillingness to seize personal glory.

Marcia returned to lead the MAA in 1989 on the occasion of Alfred Willcox's retirement. Although many people tried to persuade her to stay with MSEB, citing her unique skill set and record of success, she admitted that her heart belonged to the MAA.

Under Marcia's leadership, the MAA increased its membership, programs and revenue. She was instrumental in initiating new programs, many of which were grant-supported. Chris Stevens recalls that when she and Jim Leitzel were developing the idea for Project NExT, they wondered where they might secure outside funding. Marcia interested the ExxonMobil Foundation in the concept; in fact, Marcia was so persuasive that the Foundation indicated their willingness to provide support and requested a formal proposal primarily for recordkeeping purposes. Stevens said that "Without her successful sales pitch, Project NExT might never have become a reality." Marcia's support did not end with her fundraising; she took a keen interest in the progress of Project NExT, even after she retired from the MAA.

"It is time for me to move on to new challenges," Marcia said on the occasion of her retirement in 1999. "I have had wonderful opportunities at the MAA." Gerald Alexanderson observed, "It is difficult to imagine the MAA without Marcia at the helm."

Nonetheless, Marcia continued her association with the MAA, regularly participating in the Winter Meetings, special events at the Carriage House, and MAA study tours. Lisa Kolbe, MAA staff, treasures her memories of time spent with Marcia on the MAA's first tour to Greece. "I remember her dancing high in the mountain village of Vourliotes in the lovely white Greek outfit she bought on the island of Samos."

After her retirement, Marcia went sailing for a year in the Bahamas, a sport she had grown to love as a child. Upon her return, she found that she was not quite ready to retire. Her pioneering spirit and her love of nature led her first to the National Environmental Education and Training Foundation, whose mission is to provide objective environmental information to help Americans improve their quality of life.

Until her death, Marcia served as the Deputy Director and Director of Education at the Audubon Naturalist Society. She helped design programs to reach over 8000 children through preschool, school, camp, scout and family programs.

Marcia is survived by two sons, Douglas and David Sward and their wives, Honey and Erika, as well as her former husband, Gil Sward. She is also survived by two older brothers, Walt and Reeve Peterson, their wives, Judy and Georgia, as well as many nieces and nephews. Her first grandchild, a boy, is due in October.[1] Despite her many professional accomplishments, what mattered most to Marcia was her family.

Marcia's family has requested that donations in her memory be made to: Marcia Sward Tribute Fund, Audubon Naturalist Society, 8940 Jones Mill Road, Chevy Chase, MD 20815.

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[1] Ed. note: He was born October 10, 2008.

To increase awareness of women's ongoing contributions to the mathematical sciences, the AWM is 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 follow-ing 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 victoria.howle@ttu.edu or see the contest Web page: www.awm-math.org/biographies/contest.html. The deadline for receipt of entries is **February 27, 2009**. *(To volunteer as an interview subject, contact Howle at the e-mail address given.)*
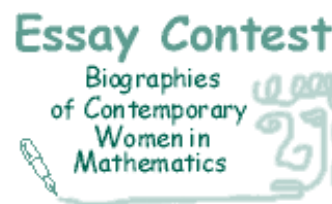
Mathematically Talented Women in Film and Television: A Summary of the Last Five Years

Sarah J. Greenwald and Jill E. Thomley,
Appalachian State University

There has been an increase in the number of portrayals of mathematically talented women in popular culture, and these portrayals are seen by millions of people around the world. So, how well do they rate? This is the inaugural article of a column that will offer reviews of movies and television programs, written for those interested in gender and cultural issues in mathematics and the sciences. Sarah Greenwald (greenwaldsj@appstate.edu) and Alice Silverberg (asilverb@math.uci.edu) invite submissions or suggestions.

Many female mathematicians, including one of the co-authors, have been told they do not look or sound like a mathematician. What does a mathematician look like? While the importance of role models is well documented, many people only know about scientists and mathematicians from popular TV or movies. There have been calls to increase the number of talented female scientists on television in order to recruit more majors. In other contexts, television shows grounded in social learning theory (i.e., a school of thought that focuses on learning concepts by direct observation, imitation, and modeling) have in fact been shown to lead to lifestyle changes (Ballard, 2006). However, some of these representations may not, in the end, be all that positive when it comes to trying to encourage students to pursue a mathematical career or recognize the importance and usefulness of mathematics. A number of prior studies showed that television commercials that are gender-stereotypic caused some women to underperform on math tests, avoid math questions in favor of verbal questions on an aptitude test, and indicate less interest in quantitative career fields than those who had not been exposed to the commercials (Davies et al, 2002). Others have written about conflicts between stereotypes of scientists and mathematicians and African-American cultural identity (Powell, 1990) and about similar conflicts for Native American students (Moore, 1994). Another small study showed that "math majors like

the negative portrayals of themselves, but, at the same time, some people did not major in math because of these portrayals" (Latterell, 2005).

The purpose of these types of programs is to entertain, and fictional shows or movies should not necessarily be held to some kind of role-model standard; instead it is our responsibility as educators to be proactive about these representations and to make an effort to include real-life history or other role models to balance these stereotypes (Greenwald, 2005).

If we are to be proactive, as suggested, we must first understand what our students are viewing. Here we briefly summarize some of the portrayals of mathematically talented women in Hollywood from the last five years.

- *21* [Columbia Pictures movie 2008]

This movie is a fact-based account of a team of MIT students who made millions in Las Vegas by counting cards. Two mathematically talented women characters—Jill Taylor, played by Kate Bosworth, and Kianna, played by Liza Lapira—are "spotters" on the blackjack team. Their role was to keep track of the card counting at blackjack tables and tell the "big players" when to actually step in and play. According to a recent *Boston Globe* interview with Jane Willis, one real-life female member of the team on which the movie was based, her portrayal is fairly accurate, though she stated that the character's role in the movie was probably more prominent (and profitable) than her own real experiences.

- *Angel* [WB television series 1999–2004]

Series regular character Winifred "Fred" Burkle was first introduced in 2001. She was traumatized and apparently mentally unstable from spending years in an alternate dimension. She quickly recovered and became an asset to the paranormal investigation and monster-fighting team led by the title character Angel, revealing knowledge of not only physics but mathematics and engineering, plus a general skill for invention. Fred and her mathematical abilities were readily embraced by the other characters. In one episode Fred published a research article on supersymmetry. Later, the audience (and Fred) found out that Fred's thesis advisor was so intimidated by Fred's abilities that he sent her to the alternate dimension to remove her as a competitor. Fred was portrayed by actress Amy Acker, who will be playing a

doctor in the upcoming science fiction series *The Dollhouse,* produced by many of the same people responsible for *Angel.* For a detailed analysis of Fred as a potential role model, see Greenwald & Thomley (2007).

• *Big Bang Theory* [CBS television series 2007–present]

Sara Gilbert plays physicist Leslie Winkle, a recurring character. She dated but broke up with Leonard Hofstadter, one of the main characters, and she regularly spars with his roommate Sheldon, who refers to her as his nemesis. She corrected one of Sheldon's equations, and he berated her for believing in loop quantum gravity rather than string theory. She previously stated that her work is too important to allow for a serious relationship, but her attitude has evolved over time to include discussions about the possibilities of marriage and children along with her career.

• *Futurama* [Fox television series 1999–2003; new episodes on Comedy Central 2008–present]

Amy Wong is an engineering student at Mars University who is currently doing her internship at the Planet Express Interstellar Delivery Company in New York, the primary setting of the show. Despite her credentials, she rarely contributes to any of the frequent scientific discussions that occur on the show. Instead she is primarily social and fashion conscious. In addition to this fictional representation, the recent direct-to-DVD movie *Bender's Big Score* contains an interactive lecture by real-life mathematician Dr. Sarah Greenwald, one of the co-authors of this article, which is included as a DVD extra. Furthermore, the movie writers created a "Greenwaldian theorem" that appears on a blackboard during the film, in honor of her work. On the same blackboard, a nod is given to physicists Lisa Randall and Raman Sundrum.

• *Ice Princess* [Buena Vista movie 2005]

The main character Casey Carlyle, portrayed by Michelle Trachtenberg, is a physics "geek" who discovers that she can apply scientific principles to the elements of competitive figure skating. While her mother wants her to go to Harvard, Casey has long secretly dreamed of skating, and this dilemma is the heart of the dramatic conflict. Unfortunately, to heighten the tension, the movie does a poor job of representing a balance in career options and a social life. Casey is presented as
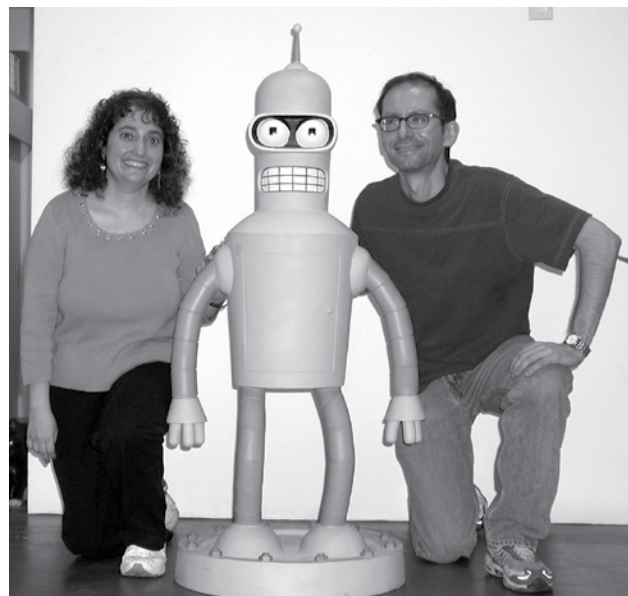
Sarah J. Greenwald's interactive mathematics lecture has been distributed on approximately one million DVDs worldwide as a 25-minute DVD extra for the 20th Century Fox Futurama movie Bender's Big Score.

having to make a mutually exclusive choice between skating and college. There is no mention of Paul Wylie, the 1992 Olympic silver medalist in men's figure skating, who managed to compete and graduate cum laude from Harvard, nor any mention of postponing Harvard for a year.

• *Julia Robinson and Hilbert's Tenth Problem* [ZALA Films documentary, 2008]

This documentary details Julia Robinson's life and work. The website for the film suggests that "Julia Robinson's story, and the presence of prominent women in mathematics in the film, should inspire young women to pursue educational opportunities and careers in mathematics" (Csicsery, 2008). An AWM review of this documentary is in process. See also Wood (2008).

• *Proof* [Miramax Films movie 2005]

Gwyneth Paltrow stars as the main character Catherine, the daughter of a brilliant but mentally disturbed mathematician who is herself struggling with the possibility of becoming a mathematician (and she is concerned about the potential of inherited mental illness). When she shows her work to

a friend, also a mathematician, people question whether she was really the author. Unfortunately, this movie offers a fairly stereotypical representation of mathematicians as those who must battle with obsession and insanity in order to do great mathematics. See also Ullman (2006).

• *Mean Girls* [Paramount Pictures movie 2004]

Cady Heron, played by Lindsey Lohan, is the previously home-schooled daughter of scientist parents who goes to a public high school for the first time at age fifteen. She struggles to balance her mathematical talent with social pressures and her attempts at being popular. Though she is enrolled in a calculus class, Cady pretends to be bad at math in order to impress a boy she likes.

• *NUMB3RS* [CBS television series 2005–present]

Mathematicians criticized early seasons of *NUMB3RS* (Greenwald, 2006b; Silverberg, 2006) because the main character was inappropriately dating his thesis student Amita, portrayed by Navi Rawat. In the third season of the show Amita became a faculty member. In addition, a female chair of the physics, mathematics, and astronomy division joined the show and echoed to Amita and others some of the critiques that mathematicians had voiced off-screen. The

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) of the National Science Foundation. 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 the 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. All applications must be submitted online via the web-based system which is available through a hotlink at http://www.awm-math.org/travelgrants.html. The application requirements and a complete step-by-step process are available at the online site. If you have not already done so you must first create a user account—this will be the first screen when you access the site. During the application process you will be asked to attach one .pdf file that includes your proposal, CV and current and pending funding information, as applicable. If you have a speaker confirmation letter or e-mail notification, scan the document as an electronic file and attach it as a .pdf. In addition, please complete the application pre-survey administered by an independent evaluator. You may contact Jennifer Lewis at 703-934-0163, ext. 213 for guidance. There are three award periods per year. The next two deadlines for receipt of applications are **February 1, 2009** and **May 1, 2009**.

chair did not appear after season three, but she has been mentioned at various times. Additionally, Amita has been increasingly portrayed less as the assistant and more as an equal research partner who contributes in significant ways.

• *Sex and the City* [New Line Cinema, Warner Brothers and HBO Films movie 2008]

Louise is an African-American computer scientist played by Jennifer Hudson. She is hired by the main character to be a personal assistant. Louise is portrayed as smart, beautiful, fashionable, helpful, and as having a social life. Unfortunately, in the film, the extent to which we see her use any computer skills is creating a passworded email folder and doing some website creation and administration. The remainder of her time is spent packing boxes and running errands for the main character.

• *The Simpsons* [Fox television series 1989–present]

Lisa Simpson, one of the main characters, is definitely not portrayed as the most popular girl in school, but she is a mathematically talented character. In 2006, the episode *Girls Just Want to Have Sums* explored the topic of women in mathematics and satirized former Harvard President Laurence Summers' comments about women in mathematics and science. In the episode, Springfield was in an uproar after a sexist comment by Principal Skinner, and as a result the school is separated by gender. Lisa pretended to be a boy in order to do the serious mathematics given the boys, as opposed to the pseudo-math assigned to the girl students. For more information, see Greenwald (2006a). Many other episodes contain short lines that poke fun at women in science issues. For example, in the 2005 episode *Future-Drama,* which is set in the future, Lisa examines a Yale course catalogue and remarks that "It's so great that Yale has finally forbidden man from taking science. Now let's see…should I major in 'femistry' or 'galgebra'?"

What do people learn about mathematically talented women from these film and television representations? Many authors have examined the effects of such representations on girls (Greenwald & Thomley, 2007), and this is likely to continue to be a fruitful area of study. Representations of nerds, geniuses, and mad scientists proliferate in popular culture. Are students interested in the mathematics because of these characters, or will they become discouraged because math does not come to them as easily as it does to the mathematicians they see on the screen? Unfortunately, the mathematical powers of geniuses are sometimes equated with mental illness, as with the women characters in *Angel* and *Proof.* Sometimes talented women deny their mathematical ability, as in *Mean Girls* and *Proof,* or they are placed in the role of the beautiful assistant, as in *21, Futurama,* early episodes of *NUMB3RS,* and *Sex and the City.* It is challenging for some women to balance a husband, family and social interests with a career in mathematics or science as represented in *Big Bang Theory* and *Ice Princess,* but others do this quite naturally, as in *Julia Robinson and Hilbert's Tenth Problem.* Many members of the general public do not personally know any women involved in mathematics and science. They may have seen only the often-skewed media presentations of mathematically talented women, like those discussed above. Furthermore, some people, even scholars, view the scientific method itself as inherently "masculine science" (e.g., Bowling & Martin, 1985). Overall, while it is wonderful to see an increase of strong talented women in math and science portrayed in Hollywood, these portrayals may yet have negative effects, as we still do not see well balanced role models with whom girls are likely to identify. There is hope for the future as scientists and popular culture scholars increasingly strive to convey the importance of exposing students to numerous role models with diverse styles and lives who collectively earn high marks.

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Call for Nominations: 2010 Louise Hay Award

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

The nomination documents should include: a one to three page letter of nomination highlighting the exceptional contributions of the candidate to be recognized, a curriculum vitae of the candidate not to exceed three pages, and three letters supporting the nomination. It is strongly recommended that the letters represent a range of constituents affected by the nominee's work. *Five* complete copies of nomination materials for this award should be sent to: The Hay Award Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. Nominations must be received by **April 30, 2009** and will be kept active for three years. For more information, 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.

Making of the *Women in Mathematics* Poster

Joseph A. Gallian, University of Minnesota Duluth

Starting in 1966 a 2' x 12' time-line poster called *Men of Modern Mathematics* was widely distributed across the U.S. and Canada. It featured about 80 key men (and one woman) in the development of mathematics from 1000 A.D. up to the mid 20th century. 1000 A.D. was selected as the beginning of modern mathematics since this was about the time that algebra and geometry started to interact. The time-line was marked off by centuries, and each featured mathematician had their picture followed by a biography text box that spanned the period from the year of their birth to the year of their death. The poster also had other biographical and historical items along with numerous pictures, to embed the development of mathematics in the context of world history. The poster, created by the famous American designer Charles Eames with the assistance of the UCLA mathematician Raymond Redheffer and commissioned by IBM, was a derivative of their 1961 project for IBM, a 3000 square foot exhibition in Los Angeles called "Mathematica: A World of Numbers…and Beyond."

In January 2007 Stanley Burris, a retired University of Waterloo mathematician whose hobby was working with Photoshop, went to the annual joint meeting with his newly created prototype of a large time-line poster featuring women who made contributions to mathematics from 1700 through the 20th century. His goal was to find a major mathematical establishment that was willing to take over the stewardship of the poster project and make it available to the mathematical community. While attending the MAA short course at the meeting Stan met Florence Fasanelli who, because of her long-standing interest in the history of women in mathematics, offered to discuss this poster project with her contacts.

When Florence showed me the prototype I immediately told her that I would like to see the MAA send a copy of the poster to every math department in the U.S. The timing was perfect for me since I was taking office as President of the MAA and I was eager to find projects to work on. Florence told me that she and Stan would be delighted to have the poster widely distributed by the MAA. After many exchanges of e-mails with Stan, I began looking for a sponsor to underwrite the cost of printing and mailing 2000 posters.

Sofia Kovalevskaia

Influenced by the radical movements of the 1860s in Russia, Kovalevskaia dedicated herself to becoming a mathematician and a pioneer of women's education. She began with private mathematics tutoring at home, but to continue her studies, she had to leave Russia. She was taught privately by Weierstrass, who persuaded Göttingen University to award "the most talented of my students" a doctorate in 1874 based on three of her papers. The Cauchy-Kovalevskaia Theorem, fundamental in the theory of partial differential equations, came from this thesis work. Kovalevskaia eventually obtained a professorship in Stockholm; she was the first woman to receive a Ph.D. in mathematics and the first to teach mathematics at the university level in Europe. In 1888 she won the Bordin Prize of the Paris Academy of Sciences for her work on the rotation of a solid body about a fixed point. *Image in the public domain.*

1850   1891

Sample biography from the Women in Mathematics *poster. Poster sponsored by Sun Microsystems. Technical consultant Stanley Burris, with assistance from Florence Fassanelli, Joe Gallian, Judith Grabiner, Susan Landau, Carl Pomerance, Amy Shell-Gellasch, and Jim Tattersall. Reprinted by permission. Copyright © The Mathematical Association of America 2008. All rights reserved.*

About that same time I received a letter from Carl Pomerance saying that Susan Landau from Sun Microsystems had seen a copy of the poster I had sent him and she was very impressed with it. With that cue, I wrote to Susan about the possibility of Sun Microsystems underwriting the cost of producing and distributing the poster. She put me in contact with Sun's Chief Technology Officer Greg Papadopoulos, who generously agreed to sponsor the project. Building upon the further work of Stan and Florence on the prototype, an ad hoc MAA committee chaired by James Tattersall and supported by Carol Baxter from the MAA headquarters created the finished product.

The 36″ x 54″ poster may be purchased for $10 at http://www.maa.org/pubs/posterW.pdf. My only role in the design was to suggest that the three women who were winners of the Putnam Competition be included in the upper right corner. Not coincidentally, all three of these women have received the AWM Alice Schafer Prize! Playing a role in having this beautiful and inspiring poster on display in math departments throughout the U.S. and Canada is one of the highpoints in my term as MAA President.

Sonia Kovalevsky High School Mathematics Days

Through grants 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.

An additional selection cycle will be held in February 2009 for Spring 2009 using funds remaining after the August 2008 selection cycle. AWM anticipates awarding up to six additional grants ranging on average from $1500 to $2200 each ($3000 maximum per school) to universities and colleges. Historically Black colleges and universities are particularly encouraged to apply. Programs targeted toward inner city or rural high schools are especially welcome.

Applications, not to exceed six pages, should include: a) a cover letter including the proposed date of the SK Day, expected number of attendees (with ethnic background, if known), grade level the program is aimed toward (e.g., 9th and 10th grade only), total amount requested, and organizer(s) contact information, b) plans for activities, including specific speakers to the extent known; c) qualifications of the person(s) to be in charge; d) plans for recruitment, including the securing of diversity among participants; e) detailed itemized budget (i.e., food, room rental, advertising, copying, supplies, student giveaways, etc. Honoraria for speakers should be reasonable and should not, in total, exceed 20% of the overall budget. Stipends and personnel costs are not permitted for organizers. This grant does not permit reimbursement for indirect costs or fringe benefits. Please itemize direct costs in budget.); f) local resources in support of the project, if any; and g) tentative follow-up and evaluation plans.

The decision on funding will be made in late February for high school days to be held in Spring 2009. If selected, a report of the event along with receipts (originals or copies) for reimbursement must be submitted to AWM within 30 days of the event date or by June 1, 2009, whichever comes first. Reimbursements will be made in one disbursement; no funds will be disbursed prior to the event date.

Send *five* complete copies of the application materials to: Sonia Kovalevsky Days Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. For further information: phone 703-934-0163, e-mail awm@awm-math.org, or visit www.awm-math.org. Applications must be received by **February 4, 2009**; applications via e-mail or fax will not be accepted.

Book Review

Gendered Innovations in Science and Engineering, edited by Londa Schiebinger, Stanford University Press, Stanford, CA, 2008, ISBN 978-0-8047-5814-7, xii+244 pp.

Reviewer: Margaret Bayer, University of Kansas

I first picked up this book six months ago, read Chapter 8, and decided I wanted to review it. This is still my favorite chapter. It is the chapter that most closely matches the title of the book. *Gendered Innovations in Science and Engineering* suggests ways in which women's perspectives and contributions have been different from men's or have set new directions in science and technology. Indeed, this volume gives examples of this, in sex determination genetics, archaeology and anthropology, environmental science, geographic information systems, and, in Chapter 8, automobile design. The book also includes several chapters on issues of women in science not closely related to the title. I will say little about those chapters.

My knowledge of "sex-determination genetics" goes back to high school biology (too many years ago). In Chapter 2, "When Gender Criticism Becomes Standard Scientific Practice," Sarah S. Richardson tells a story of exciting debates and paradigm shifts in the last twenty years, due partly to challenges from feminist scientists. In 1990 the SRY gene was identified. According to a widely accepted model, this is the master gene on the Y chromosome that directs the development of the male gonads and determines the sex of the human. (In fact, the International Olympic Committee tested for the SRY gene for "gender verification" in 1992. [p. 25]) A standard theory held that the default is the development of a female body; only the presence of the SRY gene on the Y chromosome overrides the default to result in a male. The "master gene" approach was popular in the general area of developmental genetics. The study of the SRY gene was expected to lead to a better understanding of various development processes.

Feminist biologists challenged this general view of development, and the model of sex determination in particular. Richardson argues that the existence of earlier feminist critiques and theories of science paved the way for a significantly revised theory of sex determination. A well-respected female scientist in the field, Jennifer Graves, was one of a number of people who mounted successful challenges to the sex determination model. At first she did not explicitly couch her arguments in feminist terms. But feminist theory eventually achieved a level of respectability among more scientists. By 2000 Jennifer Graves (after nomination to the Australian Academy of Sciences) explicitly acknowledged her feminist framework. "[G]ender criticism became a part of the mainstream critical practices of the field." [p. 23] This chapter gives in more detail some of the specific evidence brought to bear against the SRY gene model. In particular, sex-determination researchers have been influenced by the recognition that humans do not all fit into a strict male/female division.

The recognition of sex bias in research occurred quite a bit earlier in archaeology and anthropology. According to Chapter 4, "Sex Matters: Letting Skeletons Tell the Story" by Lori D. Hager, questions were raised in the 1970s about bias in sex identification of skeletons. Apparently DNA analysis was in the past not practical for sexing skeletons, though this is changing. The common practice was to sex skeletons based on pelvic structure, if the pelvis was present, and to use overall size and skull size when the pelvis was not available. Of course, there are many problems with this. Skeletal dimorphism of ancient hominids may not match that of modern young adults, nor be the same among different species or groups. Even pelvic dimorphism probably evolved more recently; for example, australopithecines were small-headed, so a large pelvis was not needed for the birth process. Even among modern adults, there is more overlap than difference in skeletons of different sexes, and these differences change with age (being smaller among prepubescent children, and decreasing again in old age).

What are the consequences of these skeleton-sexing practices? The assumption that smaller specimens were female obscured the possibility that specimens were

actually from different species. At certain sites, many more than half the skeletons were identified (in many cases, misidentified) as male, leading to speculation on burial practices or other explanations for the discrepancy. The identification of skeletal remains by sex leads researchers to conclusions about sex roles in ancient populations, even though the sex-identification is in part based on modern views of sex roles. "[R]econstructions of life in the past are profoundly affected by these sex determinations." [p. 74] More reliable sex identification of skeletons should improve our understanding of our ancient predecessors.

Chapter 6 is "Feminist Perspectives on Geographic Information Systems" by Mei-Po Kwan. The discussion here is a little hard to understand if one is not familiar with geographic research. Geographic information systems (GIS) is a general term referring to the use of technology for storing, managing, analyzing and presenting geographic data. But it is also understood as a particular approach to geographic research that (to grossly oversimplify) encodes information as data points on maps. (Or data points as maps? See "The Atlas of the Real World. Mapping the way we live" by Dorling, et al.) Feminists have criticized this approach as reducing and objectifying the human subjects of geographic research. In this article Kwan shows a number of ways in which GIS can be and has been used for feminist geographic research, giving examples of work that puts women's everyday lives in a geographic context or exposes gender bias in quantitative methods.

In 2002, a group of women engineers at Volvo in Sweden started a project to make a "concept car" for the Geneva Motor Show 2004. (Chapter 8: "If You Meet the Expectations of Women, You Exceed the Expectations of Men" by Tatiana Butovitsch Temm) A concept car is not expected to go into production; it is a vehicle for experimenting and getting public reaction to new ideas. The group started by looking at market research on what people want in a premium (high-priced) car, broken down by gender. They found that men's priorities formed a proper subset of women's, and they decided to focus on the additional requests. Women were not asking for changes in appearance. Their priorities were visibility, handling, interior convenience, ease of entry/exit and ease of parking. The designers responded

with adjustable steering wheel and pedals as well as seats (to improve visibility); all sorts of storage areas; an automatic door opening system, with the door opening upward; and raised corners (so that the driver could more easily see where the car ended, to make parking easier). The exterior paint has Teflon in it, so that dirt slides off easily. The tires are "run-flat"—you can drive to the gas station on the flat tire. This is not a prototype for a low-budget car; the interior is trimmed in oak, brushed aluminum, leather and wool. Nine women directed the project, with about 140 people participating at some point along the way. Those who have seen the concept car have responded to surveys on which features they would most like to have, and the responses from men and women have been just about the same. The chapter, however, does not tell us whether any of these innovations will be adopted for cars in production.

Chapter 9, "Are Photons Gendered? Women in Physics and Astronomy" by C. Megan Urry, does not present any gendered innovations. Indeed, the author states her position: "To put it bluntly, gender does not affect results in physics, astronomy, or mathematics." [p. 150] The focus of the chapter is on how male culture in physics and astronomy affects women's participation, even driving some away. Nothing new here, but it comes from a woman of impeccable scientific credentials (member of the American Academy of Arts and Sciences, chair of the Yale Physics Department, Director of the Yale Center for Astronomy and Astrophysics, etc.). Mathematicians, however, will be unpleasantly jarred by her discussion of computer science, which she uses to contrast the role of gender in applications and the gender-neutrality of pure science. "[T]he underlying mathematical basis for computer science—essentially, binary (base 2) mathematics—has no gender." [p. 162] I have no problem with the claim that binary arithmetic has no gender, but the suggestion that binary arithmetic is the main mathematical input in computer science is silly.

This collection spans a broad spectrum of subject matter and also a wide range of writing quality. Londa Schiebinger has written or edited ten books. (See the review of her book *Has Feminism Changed Science* in the September–October 2003 AWM *Newsletter*.) More attention to this one could have produced a better-written and more focused volume.

WIMIN 08

Ruth Haas and Jim Henle, Smith College

On September 27, 2008, 120 undergraduates, graduate students, post-baccalaureate students, high school teachers, college faculty, and interested parties from over 30 institutions gathered at Smith College to celebrate **W**omen **I**n **M**athematics **I**n **N**ew England, an undergraduate conference.

There were plenary talks on "The geometry of groups" by Ruth Charney of Brandeis University and "The phenomenally popular Potts model, or, a graph theorist does physics" by Jo Ellis-Monaghan of St. Michael's College. Eighteen student talks ranged from expository to REU work to presentations about graduate thesis topics. An engrossing panel discussion by graduate students on being a graduate student rounded out the day.

The turnout suggests that the conference met a genuine need. As with other undergraduate research conferences, it offered students who had done research a chance to present their work and other students the opportunity to learn what their peers had accomplished. Graduate students had a chance to talk before an audience outside their field, in effect, a chance to practice job talks. University faculty had a chance to recruit talented seniors to their graduate programs in an informal setting. Students at all levels got a chance to see the human mathematical world up close. Everyone could enjoy the unusual energy of a math conference with mostly women attendees. While there weren't specific discussions about being a women in mathematics, women students benefited from peers and role models at all levels. Questions for the graduate panelists focussed in part on choosing graduate programs to match student interests, making the adjustment to graduate level study, and working successfully with a thesis advisor.

NSF-AWM Mentoring Travel Grants for Women

The objective of the NSF-AWM Mentoring Travel Grants is to help junior women to develop a long-term working and mentoring relationship with a senior mathematician. This relationship should help the junior mathematician to establish her research program and eventually receive tenure. AWM expects to award up to seven grants, in amounts up to $5000 each. Each grant will fund travel, accommodations, and other required expenses for an untenured woman mathematician to travel to an institute or a department to do research with a specified individual for one month. Awardees may request to use any unexpended funds for further travel to work with the same individual during the following year. In such cases, a formal request must be submitted by the following February 1st to the selection committee, or the funds will be released for reallocation. (Applicants for mentoring travel grants may in exceptional cases receive two such grants throughout their careers, possibly in successive years; the second such grant would require a new proposal and would go through the usual competition.) For foreign travel, US air carriers must be used (exceptions only per federal grant regulations; prior AWM approval required).

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

Applications. All applications must be submitted online via the web-based system which is available through a hotlink at http://www.awm-math.org/travelgrants.html. The application requirements and a complete step-by-step process are available at the online site. If you have not already done so you must first create a user account—this will be the first screen when you access the site. During the application process you will be asked to attach one .pdf file that includes your research proposal (approximately five pages in length, specifying why the proposed travel would be particularly beneficial), CV, proposed budget and information on current and pending funding, if applicable. In a second step you will be asked to attach one .pdf file that includes the proposed mentor's letter of support (indicating his/her availability at the proposed travel time) and CV. You may contact Jennifer Lewis at 703-934-0163, ext. 213 for guidance. A final report will be required from each awardee. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM. The deadline for receipt of applications is **February 1, 2009**.

The conference was run through the Center for Women in Mathematics at Smith (www.math.smith.edu/center). The Center houses two programs for visiting students to spend time studying mathematics in the company of other women. There is a junior program for students from co-ed schools and a post baccalaureate program for women who have graduated and are strongly considering graduate school in mathematics, but whose undergraduate preparation is not sufficient.

The conference was one of the MAA Regional Undergraduate Mathematics Conferences (NSF grant DMS–0536991, www.maa.org/RUMC/). Additional support came from The Center for Women in Mathematics at Smith (NSF grant DMS–0611020, www.math.smith.edu/center) and Smith College (www.smith.edu).

It rained. We ran out of coffee. But community happened. Remarkable and soon-to-be-remarkable women gathered here, and we all learned a little more about the variety of women in mathematical life here in the northeast.

Keynote speakers were Ruthy Charney (right) and Jo Ellis-Monaghan.

The grad students give advice.

Smith Post-bac students helped keep things running smoothly.

The rain stopped just long enough for a photo.

WIMIN 08

Everyone enjoyed talking with others during breaks.

Attendees included undergrads, grads, faculty and Smith alums.

Mathematician and Dean Danielle Ramdath opens the conference.

NIMBioS

A new institute with a broad mandate to pursue excellence at the interface of the life sciences and mathematics has been formed at the University of Tennessee (UT) Knoxville. Known as the National Institute for Mathematical and Biological Synthesis, or NIMBioS, the center is funded by a $16 million award from the National Science Foundation (NSF).

NIMBioS intends to achieve its mandate by fostering collaborative efforts to investigate fundamental and applied questions arising in biology using appropriate mathematical and computational methods. This will be accomplished through focused research working groups, more open-ended investigative workshops, skills- and methods-based tutorials, and an expansive set of education-linked-to-research endeavors.

NIMBioS is led by Director Louis Gross, a mathematician and ecologist at UT, four associate directors, and an advisory board made up of a diverse array of mathematical and biological scientists. Suzanne Lenhart, a former president of the Association for Women in Mathematics, serves as the Associate Director for Outreach, Education, and Diversity.

Opportunities at NIMBioS include faculty positions, collaborative working groups and workshops, post-doctoral fellowships, sabbatical fellowships, facilities for short-term visitors, research experiences for undergraduates, and more. For more information on NIMBioS and the many opportunities to become involved, visit www.nimbios.org.

"We believe this center is poised to be a global hub for mathematical and biological research," said Gross. "By taking a unique approach to scientific collaboration across a variety of disciplines, NIMBioS will have an immediate impact."

Partners in NIMBioS include NSF, the U.S. Department of Agriculture and the U.S. Department of Homeland Security. Industry partners include IBM and ESRI. UT and Oak Ridge National Laboratory experts in high-performance computing will work with NIMBioS scientists to apply the power of supercomputing to the difficult questions NIMBioS will answer.

Family and Career

Do Dust Bunnies Multiply According to the Fibonacci Sequence?

Jennifer Hooper, Idaho State University

Knowing the story that rabbits multiply according to the Fibonacci sequence, I was contemplating the question in the title as I stared at the dust bunnies that never seemed to go away under the coffee table. It seems there are not enough hours in the week to teach my classes, go to committee meetings, coach my kids' math team, drive carpool, help with homework, and keep my house clean.

As another term was just about to start, I reflected on how my mother was able to do it all. She has been a mathematics professor my whole life, and our house was always markedly cleaner than any of my friends with stay-at-home moms. My whole childhood, whenever I would lament over the fact that our house needed cleaning to my friends, the inevitable response was, "What needs to be cleaned? This is what my house looks like after we clean it."

I remember helping to clean early Wednesday mornings, dusting and wiping the door stoop as my teachers were arriving at the elementary school across the street. And every Saturday morning while my brother and I had time to watch cartoons, play outside, or bake cookies, Mom would spend the morning working in her study, and Dad worked in the yard. Some of my fondest memories are the cold mornings my brother and I enjoyed watching Road Runner and Wile E. Coyote while huddled under our blankets on the couch in our family room.

I no longer wish to watch cartoons, but I do want Saturdays to be a little less hectic and I really want to have a cleaner house. After further reflection, here is how I translated these memories and my grown-up desires into practice. I started with a list of all the weekly chores that go into making our house clean: mopping floors, vacuuming rugs, dusting furniture, cleaning mirrors, countertops, microwave ovens, etc. I first broke the list into five subsets of daily chores. Then, keeping in mind my mother's doctrine of top-down cleaning and the need for children's chores and adult's chores, I listed the chores for each member of the family. My husband and I agreed to wake up the children (ages 9 and 11) 15 minutes earlier than usual every weekday, and we would all work together to clean the house. Some of those first days took a bit longer than 15 minutes as we had to train the kids in the finer points of how to scrub the bathtub, or polish cabinets, or do a "good" job mopping the floor.

We are now four weeks into the experiment. The first thing our boys ask each morning is, "What are my chores, Mom?" Then, while we are still too groggy to care about what we are doing, the house is getting clean! A most surprising added benefit has been finding out how well my husband can polish the kitchen appliances. I would never have thought of using Turtle Wax to polish stainless steel—and the result is stunning. My kitchen really gleams!

Another unexpected bonus is that everyone seems to be more intent on keeping their own things in order, so the time spent "picking up" before cleaning is almost zero.

The house is the cleanest it has ever been. Dust bunnies have been banished. I now can relax knowing that no spot on a mirror or fingerprint on a glass door will stay for more than seven days. I must admit, I do miss the sparkle of

Workshop Mentors and Discussion Group Leaders Needed

Are you looking for an opportunity to be more active in AWM? Have you considered being a mentor at one of our workshops? We're looking for volunteers to serve as mentors and discussion group leaders at the July AWM workshop, to be held July 6–10, 2009, in conjunction with the SIAM Annual Meeting in Denver, CO. Being a mentor for a graduate student or recent Ph.D. is incredibly rewarding. If you'd like to help, contact our Executive Director, Maeve McCarthy at mlmccarthy@awm-math.org.

having it all really clean for fifteen minutes. But the reward of having everyone helping to keep the house cleaner also means that we have more weekend downtime, and this is worth much more than fifteen minutes of first class ambiance.

Now, I can go back to watching Saturday morning cartoons. Oh wait! I'm the grown up, so back to the study to work, to grade, to think, and to prepare classes. But now, although I start my Saturday with office work, I know that before the day is over, I'll have time to do something fun, like taking a hike with the family.

Returning to the original question about dust bunnies and Fibonacci numbers, I can happily say that now the dust bunnies in my house do multiply according to a Fibonacci-like sequence that is defined by

$$F_{n+2} = F_{n+1} + F_n \text{ for } n \geq 0 \text{ with } F_0 = 0 \text{ and } F_1 = 0.$$

All we've done is change the traditional initial values and what a difference it makes!

Thanks, Mom, for teaching me more than just mathematics.

Ed. Note: This is the third article in our series on Family and Career. We invite further submissions.

Opportunities

Carleton Summer Mathematics Program for Women

The mathematics department of Carleton College will offer its month-long summer mathematics program to eighteen mathematically talented first- and second-year undergraduate women in 2009. By introducing these students to new and exciting areas of mathematics that they would not see in a standard undergraduate curriculum, and by honing their skills in writing and speaking mathematics, the program leaders endeavor to excite these women on to advanced degrees in the mathematical sciences and, more importantly, to increase each woman's confidence in her own abilities and connect them all into a supportive network to carry them through the remainder of their undergraduate and graduate educations.

At the heart of the program are two demanding, intense courses under the supervision of female faculty who are accomplished researchers and extraordinary teachers. Besides the coursework, participants take part in a variety of mathematical events: panel discussions on graduate schools and careers, colloquia on a variety of topics, recreational problem-solving, and visits from at least one REU organizer and the organizer of the Budapest Semester. The mathematical part of the program is balanced with weekend events including canoeing, hiking, picnics, and tubing.

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

First- or second-year women students seeking an invigorating month-long exposure to mathematics next summer (June 21–July 19) should consult the web page www.math. carleton.edu/smp or contact Deanna Haunsperger, Department of Mathematics and Computer Science, Carleton College, Northfield, MN 55057 (dhaunspe@carleton.edu). The application deadline is **February 19, 2009**.

Models in Developing Mathematics Education

The Mathematics Education into the 21st Century project, in partnership with the Dresden University of Applied Sciences, warmly invites you to attend the 10th International Conference on "Models in Developing Mathematics Education," September 11–17, 2009, in the historic and beautiful city of Dresden. The conferences are renowned for their friendly and productive working atmosphere and are attended by innovative teachers and mathematics educators from all over the world.

The Mathematics Education into the 21st Century Project is an international educational initiative whose coordinators are Dr. Alan Rogerson (Poland) and Professor Fayez Mina (Egypt). The project is dedicated to the improvement of mathematics education worldwide through the publication and dissemination of innovative ideas and materials. Information about the project and future work may be found at http://math.unipa.it/~grim/21project.

The Program Committees for the Conference invites mathematics, statistics, informatics and science teachers, university faculty members, national and regional coordina-

tors and administrators from all countries to submit proposals for inclusion in the Conference Program and publication in the Conference Proceedings. Proposals may deal with any aspects of innovative models in mathematics, statistics, science and computer education, especially those helping to make these subjects more alive, more realistic and more accessible to students in the future. See the website for further details.

NSF CBMS Regional Research Conferences

The National Science Foundation has announced support for four NSF-CBMS Regional Research Conferences to be held during 2009. These four bring to 320 the total number of such conferences since the NSF-CBMS Regional Research Conference Series began in 1969.

These conferences are intended to stimulate interest and activity in mathematical research. Each five day conference features a distinguished lecturer who delivers ten lectures on a topic of important current research in one sharply focused area of the mathematical sciences. The lecturer subsequently prepares an expository monograph based upon these lectures, which is normally published as a part of a regional conference series. Depending upon the conference topic, the monograph is published by the American Mathematical Society, the Society for Industrial and Applied Mathematics, or jointly by the American Statistical Association and the Institute of Mathematical Statistics.

Support for about 30 participants is provided, and the conference organizer invites both established researchers and interested newcomers, including postdoctoral fellows and graduate students, to attend.

Information about individual conferences may be obtained by contacting the conference organizers. Information about the series and guidelines for submitting proposals for future conferences are found in the Call for Proposals for the 2010 NSF-CBMS Regional Research Conferences. Proposals are due **April 24, 2009**. See www.cbmsweb.org for further information.

The four conferences to be held in 2009 are listed below:

Topology, C*-Algebras, and String Duality
Jonathan Rosenberg, lecturer
May 18–22, at Texas Christian University
Greg Friedman and Robert Doran, organizers
817-257-6343, g.friedman@tcu.edu
817-257-7335, r.doran@tcu.edu
facuulty.tcu.edu/gfriedman/CBMS

Adaptive Finite Element Methods for Partial Differential Equations
Rolf Rannacher, lecturer
May 18–22, at Texas A&M University
Guido Kanschat and Wolfgang Bangerth, organizers
979-845-7632, kanschat@tamu.edu
979-845-6393, Bangerth@math.tamu.edu
www.math.tamu.edu~kanschat/cbms/

Families of Riemann Surfaces and Weil-Petersson Geometry
Scott A. Wolpert, lecturer
July 20–24, at Central Connecticut State University
Jeffrey K. McGowan and Eran Makover, organizers
860-832-2850, jmcgowan@mac.com
860-832-2843, makeovere@ccsu.edu
www.math.ccsu.edu/CBMS.html

Algebraic Topology in Applied Mathematics
Robert Ghrist, lecturer
August 3–7, at Cleveland State University
Peter Bubenik and John Oprea, organizers
216-687-4688, p.bubenik@csuohio.edu
216-687-4702, j.oprea@csuohio.edu
academic.csuohio.edu/bubenik_p/cbms2009/

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

Supported by the Department of Energy, the Office of Naval Research, 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: An AWM Workshop is scheduled to be held in conjunction with the SIAM Annual Meeting, Denver, CO, July 6–10, 2009.

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

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: To be eligible for selection and funding, a graduate student must have begun work on her thesis problem, and a recent Ph.D. must have received her degree within approximately the last five years, whether or not she currently holds a postdoctoral or other academic or non-academic position. All non-US citizens must have a current US address. All selected and funded participants are invited and strongly encouraged to attend the full AWM two-day program. Those individuals selected will be notified by the AWM Office and will need to submit a final title and abstract with name, affiliation, address, etc. by mid-February to SIAM for the meeting program; AWM will provide instructions with the notification. For some advice on the application process from some of the conference organizers see the AWM website.

All applications should include:

- a cover letter
- a title and a brief abstract (75 words or less) of the proposed poster or talk
- a concise description of research (one or two pages)
- a curricultum vitae
- at least one letter of recommendation from a faculty member or research mathematician who knows the applicant's work is required for graduate students and recommended but not required for recent Ph.D.s. In particular, a graduate student should include a letter of recommendation from her thesis advisor.

Applications must be completed electronically by **January 12, 2009.**

See http://www.awm-math.org/workshop_application/application.html.

2008–2009 Membership: Sponsors and Institutions

Sponsor Dues Schedule

Friend .... $1000+

Patron .... $2500+

Benefactor .... $5000+

Program Sponsor .... $10,000+

Institutional Dues Schedule

CATEGORY 1 (includes 10 student memberships;
1 free ad; 25% off additional Newsletter & online ads) $300

CATEGORY 2a (includes 3 student memberships;
1 free ad; 10% off additional Newsletter & online ads) $175

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

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

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PURDUE UNIVERSITY CALUMET — Assistant Professor of Mathematics Education — The Department of Mathematics, Computer Science and Statistics, which is in the School of Engineering, Mathematics and Science, and the Department of Teacher Preparation located in the School of Education at Purdue University Calumet, Hammond Indiana are accepting applications for a joint tenure-track assistant professor position in K-6 Mathematics Education to begin on August 24, 2009. Requirements: A Ph.D. or equivalent advanced degree in mathematics, mathematics education, or in another appropriate field by August 2009, three(3) academic years of successful teaching of mathematics in elementary or middle school (K-6), K-6 Professional Development Experience, and evidence of ability to establish a program of research. Responsibilities: Duties and responsibilities include teaching undergraduate and graduate level mathematics content and mathematics methods courses for prospective K-6 teachers, conducting research in field of expertise, participating in service for both university departments, and working with in-service teachers. Screening of applicants will begin December 15, 2008 and continue until a suitable candidate is found. Applicants should forward a letter of application, curriculum vitae and copy of graduate transcript. Finalists will be required to provide statements of teaching philosophy and research plan, a list of 3 references with contact information and official transcripts. Professor Diana Underwood Gregg, Department of Mathematics, Computer Science, and Statistics, Purdue University Calumet, Hammond, IN 46323 FAX: (219) 989-2165 PHONE: (219) 989-2274 E-mail: diana@calumet.purdue.edu Purdue University Calumet is an Equal Access, Equal Employment Opportunity, Affirmative Action employer that is committed to a diverse workplace.

SOUTHERN CONNECTICUT STATE UNIVERSITY — Faculty Position — Southern Connecticut State University invites applications for the anticipated vacancy of a tenure-track position in Mathematics at the rank of Assistant/Associate Professor beginning August 2009. For full description of the position, application requirements, and submission process, please visit our website at: http://www.southernct.edu/employment/Job_Openings/ SCSU is an Equal Opportunity Affirmative Action Employer. Women and minorities are strongly encouraged to apply.

TEXAS A&M UNIVERSITY — QATAR — Several Open Positions — The Department of Mathematics anticipates the availability of several open positions at Texas A&M University's affiliate campus in Doha, State of Qatar (which is in the Middle East). Any level of appointment will be considered depending on the qualifications of the successful candidates. It is anticipated that appointments will be non-tenure accruing, with an initial appointment period of one year, which is renewable for additional years, subject to satisfactory performance. A Ph.D. degree is required for all professorial-level appointments (the equivalent of an assistant professor or higher). Applicants with a master's degree and teaching experience will be considered for non-professorial positions (e.g. lecturer) for more elementary instruction (and a higher teaching load). Salary rates are competitive and, in general, average 30% higher than comparable salary rates of similar positions in the U.S. In addition, summer funding is guaranteed. Liberal allowances for professional travel and for relocation to Qatar are provided. Fringe benefits include free furnished housing in one of several gated communities, K-12 education for dependents, group health insurance, annual leave allowance, and a car allowance. Texas A&M University at Qatar is a partnership with the Qatar Foundation. Now entering its sixth year of operation, TAMUQ offers Bachelor of Science degrees in Chemical, Electrical, Mechanical, and Petroleum Engineering. The degree programs are identical to those of the main campus at College Station, Texas. A Texas A&M University diploma is awarded to graduates. A new, state-of-the-art engineering building for teaching and research has recently opened. General information about TAMUQ is available at their web site http://www.qatar.tamu.edu/. The Mathematics faculty provides classes in calculus, differential equations, linear algebra, numerical methods, mathematical modeling and other related coursework, all of which form an integral part of the engineering curricula. Teaching loads are kept low (approximately three small classes per academic year for all professorial-level appointments) to promote teacher-student mentoring and to allow time for faculty to pursue research. Applicants should send the completed "AMS Application Cover Sheet" and a vita and arrange to have at least three letters of recommendation sent to: TAMU-Qatar-Faculty Hiring, Department of Mathematics, Texas A&M University, College Station, Texas 77843-3368. Further information and a link to our on-line application form are available at http://www.math.tamu.edu. At least one recommendation should address teaching qualifications. Complete dossiers should be received by **February 15, 2009**. Early applications are encouraged since applications will be reviewed as they are received. Texas A&M University is an equal opportunity employer. The University is dedicated to the goal of building a culturally diverse and pluralistic faculty and staff committed to teaching and working in a multicultural environment and strongly encourages applications from women, minorities, individuals with disabilities, and veterans. The University is responsive to the needs of dual career couples.

UNIVERSITY OF CONNECTICUT — Postdoctoral Fellows — Subject to budgetary approval, the Department of Mathematics anticipates openings for several Postdoctoral Fellow positions beginning in the Fall of 2009. Candidates will be expected to contribute to the research and teaching mission of the department. Candidates must have received a Ph.D. within the last four years and demonstrate evidence of excellent teaching ability and outstanding research potential. These end date positions are renewable for a maximum of three years. Preference will be given to candidates whose research interests intersect those of the permanent faculty. Additional information about the department may be found at http://www.math.uconn.edu. Applications must be received by **March 31, 2009**, but review of the applications will begin January 1, 2009. It is strongly preferred that candidates submit a cover letter, resume, and three letter of recommendation online at http://www.mathjobs.org/jobs, but materials may also be sent via regular mail to: Postdoctoral Hiring Committee, University of Connecticut Department of Mathematics, U-3009, 196 Auditorium Road, Storrs, CT 06269. The University of Connecticut is an Equal Opportunity and Affirmative Action Employer. We encourage applications from underrepresented groups, including minorities, women and people with disabilities.

UNIVERSITY OF SOUTH CAROLINA SUMTER — Asst. Prof. of Math, tenure-track, begin Fall 2009 — Ph.D. in Math. 12 hrs./sem. all undergrad.; expectations incl. excellence in teaching & commitment to research/scholarship. Ability to teach intro. stats. Submit vita, 3 current ltrs. of rec., copies of all undergrad. & grad. transcripts, & sum. of teaching evals., or other evidence of excellence in teaching. App. ltr. should incl. phil. of teaching & prof. goals & interests. Send materials to: Dr. James Privett, Div. of Sci., Math, & Engr., USC Sumter, 200 Miller Road, Sumter SC 29150-2498. Review of credentials will begin immed. & cont. until position filled. Foreign nationals indicate current US immigration status. AA/EOE.

2008-2009 Individual Membership Form
JOIN ONLINE at www.awm-math.org!

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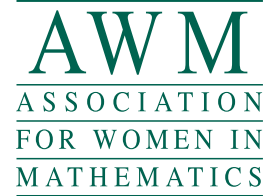
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Fairfax, VA 22030
(703) 934-0163
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AWM's membership year is from October 1 to September 30. Please fill in this information and return it along with your DUES to:

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

The AWM *Newsletter* is published six times a year and is a privilege of membership. If you have questions, contact AWM at awm@awm-math.org, (703)934-0163 or visit our website at: http://www.awm-math.org.

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Individual Dues Schedule

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

☐ REGULAR INDIVIDUAL MEMBERSHIP (New Members ONLY)..................................... $ 30   _____
☐ REGULAR INDIVIDUAL MEMBERSHIP... $ 55   _____
☐ 2ND FAMILY MEMBERSHIP... $ 30   _____
   (NO newsletter) *Please indicate regular family member:* _____
☐ CONTRIBUTING MEMBERSHIP... $125   _____
☐ RETIRED or PART-TIME EMPLOYED MEMBERSHIP *(circle one)* .... $ 30   _____
☐ STUDENT or UNEMPLOYED MEMBERSHIP *(circle one)* .... $ 20   _____
☐ ALL FOREIGN MEMBERSHIPS (INCLUDING CANADA & MEXICO)....For additional postage, add........ $ 10   _____
   All payments must be in U.S. Funds using cash, U.S. Postal orders, or checks drawn on U.S. Banks.
☐ BENEFACTOR [$5,000+], PATRON [$2,500] or FRIEND [$1,000+] *(circle one)* .... $ _____
☐ CONTRIBUTION to the "AWM GENERAL FUND" .... $ _____
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☐ 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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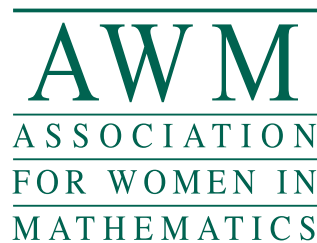Position _____ Institution/Org. _____

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Suite 200
Fairfax, VA 22030