ASSOCIATION FOR WOMEN IN MATHEMATICS

Newsletter

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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.

IN THIS ISSUE

PRESIDENT'S REPORT

An update on AWM anniversary events. In 2011, we are celebrating the 40th anniversary of the founding of AWM, and exciting events are planned throughout the year. The next events take place at the International Congress on Industrial and Applied Mathematics (ICIAM) in Vancouver during July 18–22, 2011. AWM will have an embedded meeting at this congress, featuring panels and workshops. Thanks to Gerda de Vries, Maeve McCarthy and Joyce McLaughlin for organizing the embedded meeting, and to Cammey Cole Manning who, as AWM Workshop Director, is in charge of the ICIAM workshops. I would like to acknowledge our sponsors for the ICIAM events: U. S. Department of Energy (DOE), U. S. Office of Naval Research (ONR), Pacific Institute for the Mathematical Sciences (PIMS), and the Centre de Recherches Mathématiques (CRM). The annual AWM-SIAM Sonia Kovalevsky Lecture Prize will be awarded this year at ICIAM. The address will be given by Susanne Brenner, the Michael F. and Roberta Nesbit McDonald Professor of Mathematics at Louisiana State University.

The "40 Years and Counting: AWM's Celebration of Women in Mathematics" research conference will take place September 17–18, 2011 at Brown University. Georgia Benkart, Kristin Lauter and I are organizers. I would like to acknowledge our sponsors for this event: the American Mathematical Society (AMS), Brown University, U.S. Department of Energy (DOE), the Institute for Computational and Experimental Research in Mathematics (ICERM), the Mathematical Association of America (MAA), Microsoft Research, the National Science Foundation (NSF), and Pearson Higher Education. Kristin Lauter generously donated some of her Microsoft research funds for this event.

Some women in the news. Congratulations to Sijue Wu, the Robert W. and Lynne H. Browne Professor of Mathematics at the University of Michigan, who was awarded the Morningside Gold Medal at the International Congress of Chinese Mathematicians in December 2010. This is the most prestigious award for mathematicians of Chinese descent, and Wu is the first female recipient of this award. Congratulations also to the recent Alfred P. Sloan Foundation Fellows: Maria Cameron, University of Maryland; Carina Curto, University of Nebraska; Xiaoqing Li, SUNY Buffalo; and Jessica Purcell, Brigham Young University. Jessica Purcell was also a 1998 co-winner of the Alice T. Schafer Prize for Undergraduate Women in Mathematics.

Facebook. Yes, AWM has a Facebook page! Glenna Buford, graduate student in computer science at Vanderbilt and former Executive Director Assistant, was

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ASSOCIATION FOR WOMEN IN MATHEMATICS

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.

Opinions expressed in AWM *Newsletter* articles are those of the authors and do not necessarily reflect opinions of the editors or policies of the Association for Women in Mathematics.

President's Report *continued from page 1*

primarily responsible for getting this page up and running, but both Maeve McCarthy and her present ED Assistant, Meredith Stevenson, have been instrumentally involved in the effort as well. Thanks to all three for this important step toward increasing the visibility of and access to AWM. On our Facebook page, you'll find photos from events, posts by members and followers and short news items of interest. For example, our Facebook followers found out that the Institute for Mathematics and its Applications (IMA) recently hosted a showing of the LeAnn Erickson documentary *Top Secret Rosies: The Female Computers of World War II*. The documentary tells the story of some of the women who were recruited and trained to work in classified areas performing "number crunching" during the war. Thanks to Irina Mitrea, Alexandra Ortan and Katherine Ott for organizing and publicizing this event at IMA. [Note: TSR is available via Netflix and may be purchased at www.topsecretrosies.com. See also p. 22–23.]

AWM staff update. You may have noticed that AWM is advertising for an Executive Director (see page 33). Indeed, after several years of extraordinary and productive service to AWM, Maeve McCarthy has decided that 2011 will be her last year as Executive Director (ED). In January 2012 she will resume her full-time position as Professor of Mathematics at Murray State University and is looking forward to devoting more time to the research projects she has underway. In the fall, it will be my pleasure to provide a detailed report on Maeve's accomplishments and successes during her term as ED.

Jill Pipher

Jill Pipher
Providence, RI
March 24, 2011

AWM Essay Contest

Congratulations to all the winners of the 2011 AWM Essay Contest: Biographies of Contemporary Women in Mathematics! Many thanks to Elizabeth Stanhope, Lewis & Clark College, contest organizer, for coordinating the judging. We are also grateful to Math for America for continuing to sponsor the contest. The essay contest is intended to increase awareness of women's ongoing contributions to the mathematical sciences by inviting students from sixth-graders through college seniors to write biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers.

The Grand Prize was awarded to **Stephanie Wenclawski**, John F. Kennedy High Schook, Cedar Rapids, IA; she also won First Place at the High School level. Her essay was "Mrs. Nan Mattai: More Than a Parking Spot." The grand prize essay appears on pages 3–4. The other winners will be announced in the next issue of the newsletter. To see all the prize-winning essays, visit http://www.awm-math.org/biographies/contest/2011.html.

Mrs. Nan Mattai: More Than a Parking Spot

Stephanie Wenclawski

I gazed down from the third story of my mother's office building looking at the reserved parking spots. Wow, I remember thinking, it would be impressive to have a reserved spot. As I read the names of the "important people" listed upon the markers for each spot, I realized that only one of the spots belonged to a female. At Rockwell Collins engineering is key, so this fact did not surprise me, but as I asked my mother about this woman, she simply smiled and began to tell me about this well respected colleague, Nan Mattai. I was impressed with what I heard and wanted to meet Mattai. I had the opportunity when I was serving as a volunteer at a regional competition designed to encourage future engineers. Mattai walked through the door and I realized this was a perfect opportunity to introduce myself. Apparently surprised by the respect and admiration I demonstrated, Mattai gave me a pleasant nod. More recently, I had the opportunity to learn what an outstanding role model Mattai is for all young women as well as a prime example of someone living her American dream.

Born in Georgetown, Guyana as the third child of seven children, Mrs. Mattai learned the importance of education at a young age. Mattai was raised in a middle class family, where neither parent possessed a college degree. Her parents realized an education was the best thing they could provide for Mattai and her siblings. Mattai distinctly remembers her mother saying, "An education is better than silver and gold." Mattai was competitive with her brothers, so when they chose math and science classes, she signed up for advanced math and science classes. Intrigued by math and its applications at an early age, Mattai would add up the cost of items in her mother's grocery cart when shopping. As she grew older, Mattai learned more about science and applied mathematics and Madame Curie became an inspiration to her. Because Curie was the first woman to earn the Nobel Prize for Science, Mattai established her career aspiration of becoming a scientist and researcher in math and physics.

After graduating with a degree in mathematics and physics from the University of Guyana at the top of her class, Mattai received the President's Medal and pushed onward to accomplish her dream. With consistent encouragement from her parents, Mattai earned a masters degree in nuclear physics from the University of Windsor in Canada. The transition to Canada was difficult as Guyana was a melting pot of many cultures, whose ancestry had emigrated there to work on sugar plantations, and the climate was warm, year-round. Due to her Indian descent, Mattai stood out because of both her appearance and her speech. With perseverance, Mattai overcame challenges and took advantage of the plethora of scientific instruments and equipment to further her learning. Mattai's work was very well respected, and she was honored with her photograph on a Guyana postage stamp.

Mattai's perfectly planned future went astray due to "life's circumstances." While in school at the University of Windsor her oldest son was born, a premature baby weighing just 4 pounds 13 ounces. With her husband still in school, no immediate family to help out, and day-care unaffordable for two students, Mattai remembered her parents' words, "Family comes first." As a result, Mattai left her doctoral program to care for her new son.

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Membership Dues
Membership runs from Oct. 1 to Sept. 30
Individual: $55 **Family (no newsletter):** $30
Contributing: $125
New member, new SIAM reciprocal member, retired, part-time: $30
Student, unemployed: $20
Outreach: $10
Foreign memberships: $10 addt'l. for postage
Dues in excess of $15 and all contributions are deductible from federal taxable income when itemizing.

Institutional Membership Levels
Category 1: $300
Category 2: $300
Category 3: $175
Category 4: $150
See www.awm-math.org for details on free ads, free student memberships, and ad discounts.

Sponsorship Levels
α **Circle:** $5000+
β **Circle:** $2500–$4999
Other levels available.
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 S&H ($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 Ads—AWM will accept ads 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 $110 for a basic four-line ad. Additional lines are $13 each. See the AWM website for *Newsletter* display ad rates.

Newsletter Deadlines
Editorial: 24th of January, March, May, July, September, November
Ads: Feb. 1 for March–April, April 1 for May–June, June 1 for July–Aug., Aug. 1 for Sept.–Oct., Oct. 1 for Nov.–Dec., Dec. 1 for Jan.–Feb.

Addresses
Send all queries and all *Newsletter* material except ads and material for media and book review columns to Anne Leggett, leggett@member.ams.org. Send all book review material to Marge Bayer, bayer@math.ku.edu. Send all media column material to Sarah Greenwald, greenwaldsj@appstate.edu and Alice Silverberg, asilverb@math.uci.edu. Send everything else, including ads and address changes, to AWM, fax: 703-359-7562, e-mail: awm@awm-math.org.

When the time came to restart her career, Mattai considered her options and decided to apply what she knew to make a difference in engineering and math. Mattai's first engineering job, at Magnavox Electronics in Southern California, was as a software engineer. Doing the "continuous learning" that she loves, Mattai learned about Global Positioning Systems. This is a move that would prove beneficial for her future. Moving up the management ranks, Mattai began to focus on helping other technical contributors while enhancing her own skill set.

In 1993, Mattai and her family moved to Cedar Rapids, Iowa. Mattai accepted a position as a software engineer at Rockwell Collins in a newly developed department named Data Links. Mattai continued to stretch herself and traveled frequently throughout the world meeting customers and discussing innovative solutions to business problems. In 2001, Mattai was promoted to Vice President of Engineering for one of the company's business segments. This role required Mattai to assume leadership of 1,500 engineers. In recognition of her ongoing excellence in both the technical and leadership areas, in 2004 Mattai was promoted to her current position: Senior Vice President of Engineering and Technology, reporting to Chairman, President, and CEO Clay Jones. Mattai now manages the company's engineering workforce, which is one-third of the company's 20,000 employees. Mattai's role requires significant external interface and public speaking on the importance of STEM education and innovation. Mattai's advice to those interested in pursuing a career in mathematics is "to take on challenging assignments and stretch beyond your comfort zone, deliver results that exceed expectations, and seek out mentors in the field."

Mattai loves to travel and cook. Though she has visited much of the world, Mattai is still mesmerized by the beauty of other countries. Although Mattai failed to mention her numerous awards for leadership, technical excellence and innovation, she continues to be an inspiration for others. Named as one of the 2010 Iowa Women of Innovation, Mattai is clearly more interested in making a difference than winning awards.

Mattai's focus on hard work, excellence and innovation has helped her succeed in numerous positions. Her leadership skills and accomplishments have gained her respect and an elite parking spot. Mattai's philosophy of "if you keep at your goals you will get what you want" has brought her to remarkable heights. The lesson her parents instilled in her, "there are no boundaries to what one can accomplish," is now being nurtured and instilled in others. Mattai continues to educate and encourage, specifically young women, to follow their dreams, break down barriers and join the workforce in math and science related fields.

About the Student: As a junior at John F. Kennedy High School in Iowa, I am constantly engrossed in activities. I am Vice President of Best Buddies Club, Treasurer of Key Club, Science Roadshow Facilitator, and Student Volunteer Coordinator of the Regional Future Cities 4000 Competition. I serve as a member of the Academic Decathlon and math teams. I also volunteer in the community, serve on the Iowa Youth POWER Board, and try to make a difference in the lives of others. I plan to study marine biology, among numerous other subjects, and help break down barriers for females.

ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM ONLINE

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Online Ads Info: Classified and job link ads may be placed at the AWM website.

Website: http://www.awm-math.org

AWM DEADLINES

NSF-AWM Travel Grants: May 1, 2011 and October 1, 2011

AWM Student Chapter Poster Session: June 10, 2011

Early Career Mathematicians Poster Session: July 31, 2011

Sonia Kovalevsky High School and Middle School Mathematics Days: August 4, 2011

AWM Workshop at JMM: August 15, 2011

AWM Alice T. Schafer Prize: Oct. 1, 2011

AWM Noether Lecture: October 15, 2011

AWM-SIAM Kovalevsky Lecture: November 1, 2011

Ruth I. Michler Memorial Prize: November 1, 2011

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Brenner to be AWM-SIAM Sonia Kovalevsky Lecturer

The Association for Women in Mathematics (AWM) and the Society for Industrial and Applied Mathematics (SIAM) have selected **Susanne C. Brenner** to deliver the prestigious Sonia Kovalevsky Lecture at the 2011 International Congress on Industrial and Applied Mathematics. Brenner is the Michael F. and Roberta Nesbit McDonald Professor of Mathematics at Louisiana State University. She was selected as the Kovalevsky Lecturer in recognition of her significant research accomplishments in multigrid methods, domain decomposition methods and finite element analysis.

Brenner received her B.S.Ed. in mathematics and German from West Chester State College, her M.A. from SUNY Stony Brook, and her M.S. and Ph.D. in mathematics from the University of Michigan. She began her academic career at Syracuse and Clarkson Universities and spent many years at the University of South Carolina. She has been at the Louisiana State University since 2006. At LSU she is also currently the Associate Director for Academic Affairs at the Center for Computation and Technology.

Susanne C. Brenner

A SIAM Fellow and a recipient of the Humboldt Forschungspreis, Brenner is the author of over 70 research articles and a monograph, *The Mathematical Theory of Finite Element Methods* with L.R. Scott. She has held many visiting professorships around the world throughout her career, including positions at the Max-Planck Institute, Humboldt-Universität zu Berlin, Imperial College, Université de Paris VI, Chinese Academy of Sciences, the IMA and MSRI.

Susanne Brenner serves on many editorial boards, including those of the *Notices of the AMS*, *SIAM Journal on Numerical Analysis*, *Numerische Mathematik*, *Mathematics of Computation* and the *Electronic Transactions on Numerical Analysis.*

Susanne Brenner has supervised nine doctoral candidates and five postdoctoral fellows. She has served AWM as a member of the Travel Grants Selection Committee and as the founding faculty advisor of the Louisiana State University AWM Student Chapter. She is also a founding faculty advisor for SIAM Student Chapters at the University of South Carolina and Louisiana State University. She is a member of the Scientific Council for the Centre International de Mathématiques Pures et Appliquées and the National Advisory Board for SAMSI. Brenner is currently a member of the SIAM Council and serves as SIAM's Vice President for Publications.

The 2011 ICIAM will be held July 18–22 in Vancouver, Canada. The Kovalevsky Lecture honors Sonia Kovalevsky (1850–1891), the most widely known Russian mathematician of the late 19th century. In 1874, Kovalevsky received her Doctor of Philosophy degree from the University of Göttingen and was appointed lecturer at the University of Stockholm in 1883. She did her most important work in the theory of differential equations. Past Kovalevsky lecturers are Suzanne Lenhart, Andrea Bertozzi, Dianne O'Leary, Lai-Sang Young, Irene Fonseca, Ingrid Daubechies, Joyce McLaughlin and Linda Petzold.

AWM 40TH ANNIVERSARY 40 1971–2011

ASSOCIATION FOR WOMEN IN MATHEMATICS

40 Years and Counting:

AWM Celebrates its 40th Anniversary in 2011

To commemorate the occasion, we encourage all AWM members to:

- ***Renew*** your own membership.
- ***Recruit*** a new member. Personal invitations really work!
- ***Remind*** your institution of the benefits of institutional membership.
- ***Reach*** into your pocket and make a contribution to an AWM Circle of Giving or the AWM Anniversary Endowment Fund.

And be sure to check out the special celebratory events posted on the AWM website, www.awm-math.org.

Newsletter Thank-yous

This year we are beginning a new tradition of thanking those who have contributed to the newsletter, as authors or in other important ways. Also, we would like to remind you that we welcome submissions: stand-alone articles, contributions to columns, announcements, alerts to interesting material, and so on. We love photos (with captions), but need high-resolution images to show them off best in the print edition. Keep that in mind when you snap your shots! Special thanks go to Cathy Kessel, who has helped us in so many ways over the years, and to Cindy Dyer, whose work as our newsletter designer makes all of us look good.

Thanks so much to all of you who make lives easier for those of us on the Newsletter Team, in our different capacities. We appreciate you all. The 2010 list is:

Martha L. Abell
Edward Aboufadel
Honor Lucy Adamson Bailey
Margaret Bayer
sarah-marie belcastro
Georgia Benkart
Sherry Boas
Sylvia Bozeman
David Bressoud
Glenna Buford
Bettina J. Casad
Amy Cohen
Annalisa Crannell
Chandler Davis
Jackie Dewar
Cindy Dyer
Todd Finkelmeyer
Rebecca Goldin
Evelyn Boyd Granville
Mary Gray
Sarah J. Greenwald
Patricia Hale
Steve Hobbs
Pao-sheng Hsu
Rhonda Hughes
Matthew Hundley
Pat Kenschaft
Cathy Kessel
Barbara Keyfitz
Anne Leggett
Suzanne Lenhart
Jennifer Lewis
Lee Lorch
Cammey Cole Manning
Ellen Maycock
Maeve McCarthy
Irina Mitrea
Mary Morley
Kathy O'Hara
Beatrice Pelloni
Teri Perl
David Porush
Stacey Roberts-Ohr
Kristine Roinestad
Judy Roitman
Frances Rosamond
Linda Rothschild
Alice Silverberg
Gwen Spencer
Bhama Srinivasan
Gigliola Staffilani
Meredith Stevenson
Jean Taylor
Audrey Terras
Barbara Victor
Marie A. Vitulli
Erica Dakin Voolich
Faye L. Wachs
Ginger Warfield
John E. Wetzel
Carol Wood
Carolyn Yackel
Elizabeth Yanik

MEDIA COLUMN

In addition to longer reviews for the media column, we invite you to watch for and submit short snippets of instances of women in mathematics in the media (WIMM Watch). Please submit to the Media Column Editors: Sarah J. Greenwald, Appalachian State University, greenwaldsj@appstate.edu *and Alice Silverberg, University of California, Irvine,* asilverb@math.uci.edu.

Review of *Rites of Love and Math*

Julie Rehmeyer

The climax of the new film *Rites of Love and Math* comes—both literally and figuratively—when the Mathematician has just finished tattooing his formula of Love onto his beloved's belly in a passionate, mathematical frenzy. She writhes from the jabs of his bamboo tattooing pen, finally breaking through the silence to cry out in pain, ecstasy, something.

Mathematics, we're supposed to see, is an erotic art.

While that idea might induce giggles and embarrassed glances around the departmental common room at tea time, it has a noble pedigree. Socrates taught that the first moment of longing after a sexy body is also the first step in learning to love absolute, unchanging, unembodied truth. Loving one beautiful body naturally leads to adoring beautiful bodies in general, and then to loving all beautiful things, and then to loving most the most beautiful things of all. For Socrates that means philosophy, with only a brief stop along the way at mathematics. But we mathematicians can perhaps forgive him for a slight misapprehension of what lies at the very peak of human endeavors in order to consider how his conception may illuminate the experience of doing mathematics.

As absurd as the juxtaposition of math and erotic ecstasy might seem, mathematicians do passionately love doing mathematics. A mathematical problem can seduce: sometimes instantly and totally, in the mathematical version of love at first sight, and sometimes more slowly, like a striptease, as the problem reveals more of itself over time. Coaxing the problem into succumbing demands one's full powers of creativity, attention and devotion. A puzzle can obsess one much as a lover does, present even when absent, occupying the mind while the body blankly pushes change into the parking meter or refills the coffee cup.

Of course, non-mathematicians rarely get a glimpse of this. There are few things less erotic, after all, than a math exam returned covered in red ink.

Rites of Love and Math undertakes the noble task of baring the erotic side of math to all, and its co-creator, mathematician Edward Frenkel, was so committed to the effort that he was willing to bare his own erotic side—along with much of his front and back sides—to all in the process. He plays the Mathematician, who has resolved that he must kill himself to protect his discovery of the "formula of Love" from the "forces of Evil" that would somehow use it as a "weapon against Humanity." But first he makes highly stylized love to his secret girlfriend Mariko (Japanese for "Truth"), moving slowly from one erotic pose to the next as Wagner's Tristan operatically questions the meaning of life. His final task is to keep his formula alive but safely concealed after his death by tattooing it onto his beloved's belly. The music shifts to a cacophony of electric guitars, and Mariko and the Mathematician lock eyes as she submits to the rapturous pain of being indelibly marked with mathematics. She writhes in some unknowable combination of agony and pleasure as he becomes lost in frenzied concentration, no longer aware of anything beyond her beautiful, increasingly mathematical belly. He brings his effort to a climax with its final dϖ as her masochistic pleasure reaches its own crescendo. Finally, revealed in blue ink on her lustrous flesh is beauty itself: the formula of Love (which is taken from Frenkel's own work on the Langlands program).

Having finished his task—and still without so much as a glance at his beloved's face—the Mathematician stabs himself with the bamboo pen. Mariko, meanwhile, is too absorbed in her own recovery to notice. Once she's come to, she kisses his dying body and slowly, artfully pulls on her kimono, glancing back as she walks away from her fading lover, her body now carrying his mathematical seed.

The plot raises basic questions that it never answers like, What the heck is a "formula of Love" anyway? How could it be used as a weapon against humanity? And how does tattooing it on Mariko's body help matters? Instead of narrative thrust, the film aims to develop an aesthetic vision of mathematics. The events unfold on a Japanese Noh stage, with no dialogue, a minimum of props, and, with the exception of the tattooing scene, only the slowest and most controlled movements. It is trying to be a kind of visual poem, with the

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NSF-AWM Travel Grants for Women

Mathematics Travel Grants. Enabling women mathematicians to attend conferences in their fields provides them a valuable opportunity to advance their research activities and their visibility in the research community. Having more women attend such meetings also increases the size of the pool from which speakers at subsequent meetings may be drawn and thus addresses the persistent problem of the absence of women speakers at some research conferences. 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.

Mathematics Education Travel Grants. There are a variety of reasons to encourage interaction between mathematicians and educational researchers. National reports recommend encouraging collaboration between mathematicians and researchers in education and related fields in order to improve the education of teachers and students. Communication between mathematicians and educational researchers is often poor and second-hand accounts of research in education can be misleading. Particularly relevant to the AWM is the fact that high-profile panels of mathematicians and educational researchers rarely include women mathematicians. The Mathematics Education Research Travel Grants provide full or partial support for travel and subsistence for

- mathematicians attending a research conference in mathematics education or related field.
- researchers in mathematics education or related field attending a mathematics conference.

Selection Procedure. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians and mathematics education researchers appointed by the AWM. A maximum of $1500 for domestic travel and of $2000 for foreign travel will be funded. For foreign travel, US air carriers must be used (exceptions only per federal grant regulations; prior AWM approval required).

Eligibility and Applications. 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) and with a work address in the USA (or home address, in the case of unemployed applicants). Please see the website (http://www.awm-math.org/travelgrants.html) for further details and do not hesitate to contact Jennifer Lewis at 703-934-0163, ext. 213 for guidance.

Deadlines. There are three award periods per year. Applications are due **February 1**, **May 1**, and **October 1**.

brushstrokes of scene and plot pointing toward some allusive (and elusive) whole.

Frenkel and his co-director Reine Graves meant the film as an homage to the 1966 Japanese short film *Rite of Love and Death,* in which the main character is a Japanese lieutenant played by Yukio Mishima, a three-time nominee for the Nobel Prize in Literature who also wrote, directed and produced the film. At the start of that film, the lieutenant is in a nasty fix: He had planned but then not participated in a coup that has now failed, and as a member of the Imperial Guard, he will be required to kill his comrades the following day. The only honorable path, he decides, is suicide before morning. His bride Reiko resolves to join him in the everlasting, welcoming death so completely that she "feels as she did on her wedding night." As in Frenkel's version, they make love, showing off the effects of Mishima's bodybuilding in a series of beautifully framed poses. The lieutenant then disembowels himself, lingering as he pushes down his loincloth to find the ideal spot to thrust the sword into his perfectly muscled abdomen. He sweats and grimaces as he pulls the sword across his belly, his intestines finally spilling from his body. Meanwhile Reiko (and the camera) follow his sufferings in gory detail, achieving an intensity of communion that far exceeds the lovemaking. Reiko helps him finish the job by thrusting the sword into his neck and then cuts her own throat.

The original film, though disturbing, bizarre, and nearly unwatchable, presents a vision of life as a work of art: pure, austerely beautiful, uncompromising, honed sharp as a sword. The film embodies the same aesthetic itself, and this unity gives it a powerful resonance even while Mishima's obsessions in the movie—the blurring between sex and violence, the rigid sense of honor, the almost inhuman physical strength, and the extreme narcissism—leave the viewer feeling simultaneously reproached for being soft and disgusted by the film's self-destructive and over-simplified ideal. Mishima embraced his vision so thoroughly that four years later, he attempted a coup himself and committed hara-kiri upon its failure. (One certainly hopes that Frenkel doesn't plan a reprise.) Mishima's widow destroyed all copies of the film, and it was only 35 years later that the negatives were discovered in a tea box.

The remake takes on the spare outer aesthetic of the original, imitating it shot by shot, while dispensing with the inner aesthetic. The Mathematician's self-sacrifice comes not from an inner compulsion for honor, but from an altruistic desire to protect the world. In the original, sex and violence are interwoven by the demands of the aesthetic, but in Frenkel's version, it becomes an accident of a peculiar moment, as the eroticism of the lovemaking bleeds into the scene of tattooing and suicide. The enjoyment the characters derive from the intermingling then becomes a strange, cringe-worthy bit of oversharing. The physical beauty of the movie becomes an illustration of the abstract beauty of mathematics, but its physical manifestation is no longer central to the film's vision of the world. The allegory of the original turns into caricature, its diamond-hard inner core replaced with a mash-up of contrived ideas and a dash of mathematics.

This could be forgiven if the film presented a coherent vision of the erotic nature of math. After all, Frenkel is a mathematician, not a professional actor or filmmaker, and the movie is at its core an open love letter to mathematics. But what could the vision be? That mathematics is something burned into the flesh of a woman, causing her pain and delight? Or, if we take the act of writing the formula as a stand-in for the discovery of it, that doing mathematics is far more engaging than sex, so compelling that a mathematician will ignore his beloved while doing it? (One hopes that math's potent charms do not inevitably leave its practitioners so disengaged.) As a picture of mathematical collaboration, the vision is one-sided, with Mariko apparently knowing nothing of the mathematical content and being only a passive repository for it, a piece of paper. Even if we see the Mathematician's beloved as a stand-in for mathematics itself, it's hard to come away with anything beyond the claim that math is sexy.

Socrates offered a deeper analysis two thousand years ago. Though his preferred department in the academy is philosophy (literally, "love of wisdom"), by substituting a few words, his comments can easily be read as applying to mathematicians:

> He who in youth has the seed of ~~wisdom and virtue~~ *mathematics* implanted in him and is himself inspired, when he comes to maturity desires to beget and generate. He wanders about seeking beauty that he may beget offspring … above all when he finds a fair and noble and well-nurtured soul, he embraces [him], and to such an one he is full of speech about ~~virtue~~ *mathematics* and the nature and pursuits of a good ~~man~~ *mathematician;* and he tries to educate him … and they are married by a far nearer tie and have a closer friendship than those who beget mortal children, for the children who are their common offspring are fairer and more immortal. Who, when he thinks of ~~Homer and Hesiod and other great poets~~ *Hilbert and Hardy and other great mathematicians,* would not rather have their children than ordinary human ones?" (Plato's *Symposium,* Benjamin Jowett translation, 209b–209d)

Or, to put it more simply, Socrates is saying that one of the greatest erotic encounters (though, assuredly, a chaste one) is that between an advisor and a student. A more explicit cultural understanding of the role of the erotic in math might help protect students from Eros gone wrong.

More generally, this points to a little-known aspect of mathematics: It is a social sport. While occasionally an Andrew Wiles will lock himself in the attic for seven years to crack a great problem, most mathematicians work out their ideas by talking about them. They teach their students, they bounce ideas off one another, they nurture their love of math through sharing it. Out of the bond of joint exploration and joy in mathematics grow mind-children carrying the genetic material of both parents, unlike the sterile seed of Frenkel's equation spilled on Mariko's belly.

One of the most uncomfortable aspects of the film is that it creates an erotic relationship between Frenkel and the viewer, whether the viewer wants it or not. Frenkel is acting as the older man, striving to share his love of mathematics and to seduce the viewer into joining him in that love. But this time, Eros has failed him.

Rites of Love and Math: The Controversy

Sarah J. Greenwald

In November the Mathematical Sciences Research Institute (MSRI) announced a December 1, 2010 Berkeley screening of two films: *Rite of Love and Death* (1966) and *Rites of Love and Math* (2010). This was brought to my attention as chair of the AWM Policy and Advocacy Committee. MSRI included a link to a website [1] (which now redirects to [2]) with the trailer and press kit for *Rites of Love and Math.* The press kit explained the plot, which involves tattooing a formula on a woman, and stated: "He wants to tattoo the formula on her body in order to hide it from evil. Mariko accepts the pain and suffering of the tattoo. She will do anything for him because she loves him." The film was also advertised on UC Berkeley's mathematics department bulletin boards.

Several days afterwards, anonymous counter posters [3] appeared at UC Berkeley. For instance, one was a "Problem of the Day" that asked which scenario was more likely and presented a number of statements including: "*A.* A woman will settle the Riemann Hypothesis" and "*K.* Your talented daughter is majoring in math away from home. She is unsure of her talents. You will recommend this movie; it will inspire her to see that math is beautiful." Another poster imagined a world where the gender balance in mathematics was reversed, and the male students felt vulnerable and formed a support network called the Coxeter Algebra (presumably a riff on UCB's Noetherian Ring for women). The UCB department chair Hugh Woodin took down the counter posters, citing that they were in space designated for official announcements and "We do not yet have space allocated for anonymous comments," but he made them available to view in the chair office. He left up the film advertising since it was for an MSRI sponsored event regarding the creative activity of a faculty member.

On November 29, MSRI posted on its website an open letter from MSRI director Robert Bryant withdrawing MSRI's co-sponsorship of the Berkeley screening. After giving some of the background, he explained, "I began to get emails from distressed and upset colleagues who had viewed the trailer and found it disturbing, offensive, and/or insulting to women. They reported seeing the trailer as 'depicting a male fantasy of sexual domination of women' and 'sending a message that men do mathematics while women are reduced to passive sex objects'.... It became clear that our discussion around these issues was revealing deep-seated gender issues in the mathematics community that are not being addressed." In response to the controversy, Edward Frenkel, the UC Berkeley mathematician who starred in the film and co-wrote, co-directed, and co-produced it with French filmmaker Reine Graves, noted [6] "The film is not a commentary of gender issues in science, and it should not be interpreted this way."

I encourage the reader to see [4] for Bryant's full letter and [5], [6] and [7] for reports on the controversy and interviews with Bryant and Frenkel.

[1] http://math.berkeley.edu/~frenkel/RITES

[2] http://ritesofloveandmath.com/

[3] https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxhd21tYXRofGd4OjdmNTY5MWU4ZjAyMjQyYzk

[4] http://www.msri.org/web/msri/news/Announcements/-/announce/239

[5] http://www.eastbayexpress.com/ebx/erotica-intrigue-and-arithmetic-in-rites-of-love-and-math/Content?oid=2258787

[6] http://www.sfbg.com/sexsf/2010/12/01/rites-nude-math-professors-and-berkeley

[7] http://newscenter.berkeley.edu/2010/11/30/rites

BOOK REVIEW

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

The Bold and the Brave: A History of Women in Science and Engineering, Monica Frize, University of Ottawa Press, 2009, ISBN 987-0-7766-0725-2

Reviewer: Teri Perl, Ph.D., Past President, Expanding Your Horizons Network, author of Math Equals *and* Women & Numbers, *coauthor of* Notable Women in Mathematics

In *The Bold and the Brave: A History of Women in Science and Engineering,* Monique Frize, Canadian writer and academic, has written a book that is intended, in her own words, "to investigate how women have strived throughout history to gain access to education and careers in science and engineering." This is not a book you'll be wanting to read for recreation … but it certainly is a book you'd want to include in your library if you're interested in women and STEM. Again, as Frize writes, this book "… introduces key concepts and debates in order to contextualize the obstacles that women have faced, and continue to face, in these fields." Starting with the ancient Greeks, Frize moves through the Middle Ages to modern times, examining changes in attitudes toward women's education in general as well as in the sciences. Written by a woman who is a Canadian engineer and professor, one personally involved in bringing attention to this area, the book is particularly detailed when examining recent attitudes and practices toward women in the field of engineering.

The book is divided into four major sections whose titles demonstrate the book's range: Views of Women's Intellectual Abilities (from ancient times to the 18th century), Scientific Education of Women from the 17th Century to the 19th Century, Education and Careers in Science and Engineering in the 20th Century, and finally, Profiles of Three Women by Peter Frize, the author's husband. Included as well are a preface, an epilogue, a comprehensive bibliography and several interesting appendices and graphs summarizing various studies of women in science, particularly in engineering, a field where the author has special expertise.

In a way, Frize has written three books. The first two sections richly detail the available historical information drawing on a range of sources. The third section, in actual number of pages roughly equal to the first two combined, deals with more contemporary issues. The fourth section, again different, contains the three biographical profiles mentioned above.

When I arrived at the appendices I was sorry I had not read them first. Appendix 1 in particular, Arguments about Women's Nature, would have been an excellent outline while reading the first two sections of the book. The first table here, entitled "Framework of Forms of Arguments about Women's Natures," summarizes much of the overall information as well as the nature vs. nurture controversy detailed in these first sections. It charts attitudes of philosophers and major authors toward women in general and women in science in particular, as revealed in their writings and lectures.

Appendix 2, "Degrees Awarded and Students Enrolled in Science and Engineering," is quite different. It contains hard data, comparing various educational outcomes between Canada and the US, thus filling out the information in the third section of the book.

Frize begins her book by describing the views of Plato and Aristotle, two ancients who supported opposite views of women's innate abilities. Plato's view is most positive. While noting the inarguable difference between men and women, that only women can bear children, Plato notes further that birth does not of necessity mean child rearing. Aristotle, on the other hand, offers a more negative view, one that seems to have been promulgated by the church, thus shaping the dominant view for centuries.

Hard to resist this quick look at quotes from other renowned philosophers:

> **Locke (1632-1704):** it's all about property; women should be educated so they can educate their children.
>
> **Rousseau (1712-1778):** all men are born equal; not all women.
>
> **Hume (1711-1776):** though women are better at some things, they are too swayed by emotions.
>
> **Kant (1724-1804):** women possess deep beauty, elegant understanding; men possess understanding.
>
> **Humboldt (1767-1835):** men are more enlightened; women are more emotional.

The book is rich in interesting details, many new to me, for example, the role of monasteries in early science. Frize cites the work of David Noble, who in 1992 wrote a book tracing the history of modern scientific culture. Noble describes the evolution of this monastic culture, this "world without women." Much of the intellectual work, including science and mathematics, was performed by clerics and monks, except during a brief period in the 7th and 8th

centuries when double monasteries existed, with monks and nuns working side by side in France, England, Ireland, and later Germany. By the end of that period only five of the fifty-three monasteries for women survived. By the early 13th century monasteries for women had ceased to exist.

We learn of other interesting movements that led to the exclusion of women where they had originally been included. The European witch hunts, for example, particularly intense by the 16th and 17th centuries, provided the momentum to effectively remove women from earlier roles they had played in medicine, alchemy, and other sciences. The actual numbers of women killed for witchcraft were truly appalling.

Early in the book we learn that women in the 16th and 17th centuries were freer since science was not yet highly regarded. In fact it is interesting to learn that by the 17th century science was kept out of the curriculum for boys in schools for higher learning as an inappropriate field of study for a gentleman. This created a better opportunity for women.

Frize includes instances of fortunate female scientists whose parents, having early recognized their talents, supported their education. Sophia Brahe (1556–1643), the Danish astronomer, is such a woman. Even here, her professional discoveries were singly attributed to her brother, with whom she collaborated when freed from a marriage by the death of her husband. The author cites several other specific cases of women whose work was credited to husband, brother, or son.

In the final paragraph of the excellent chapter Women Who Participated in Science in Early Modern Europe, we read: "Thus science as an endeavour became masculinized, excluding women as practitioners. Science and masculinity became associated with mind, reason, and objectivity, while females were ascribed nature, feeling, and subjectivity. The assumption was that women were by nature not suited to the practice of science."

Italy, we learn, is unique among European countries in the early modern era, in that women, though only in small numbers and from wealthy or noble families, were indeed allowed to study and teach in universities. "The University of Bologna had allowed women to attend lectures from its inception, in 1088…." The author traces the careers of several women such as Laura Bassi (1711–1778) and Maria Agnesi (1718–1799) who were educated, and who taught at Bologna in the 18th century. Laura Bassi's career in particular is amazing in that she married a fellow scientist who became her assistant, had eight children of whom five survived, pioneered the medical field of biomedical engineering, published twenty-eight papers (most in physics and hydraulics), became one of the highest paid science professors at the university and was appointed to a chair in physics at the Institute of Sciences in Bologna two years before she died. Unfortunately, Frize goes on, "Laura Bassi's example did not open doors for other women." And degrees for women continued to be granted most infrequently.

The next section of the book focuses on 19th century reforms in schools and universities. Here we see a push to educate women longer, through middle and secondary school. And we see, as well, the beginning of a movement toward coeducation as a way to use facilities more efficiently, thus saving money. "However the teaching of science and mathematics to girls tended to dwindle from the 1860s, at the same time as the new curriculum introduced in many schools for boys included more science." We see this tendency today, the author notes, where it is common to see a majority of boys in high school physics, computer and information technology classes.

It was not until 1948 that students admitted to Girton College for women, founded in Cambridge in 1873, were actually awarded a Cambridge degree. The biographical section on Rosalind Franklin includes the interesting note that in 1945, when Franklin was awarded a doctorate from Cambridge, women were still excluded from receiving bachelor's degrees at that institution.

In the third major section, Women in Engineering, Mathematics, and Science in the 20th Century, the overview indicates that gender stereotypes persist. Frize describes several studies where male/female names were switched on essays in several fields. In general articles assumed to be written by men were evaluated more positively.

This third section is supported by the second appendix, "Degrees Awarded and Students Enrolled in Science and Engineering." Here information shows that the number of women in engineering is not increasing even though the number of women in science overall is. Much of this data is based on Canadian studies, not surprisingly so, considering the background of the author. Dr. Frize, with a background in medical engineering, is a professor in the Department of Systems and Computer Engineering at Carleton University in Ottawa, with a joint appointment in the School of Information Technology and Engineering at the University of Ottawa.

The last section here looks to solutions. Frize suggests the importance of developing a more women friendly culture in educational institutions. Here Carnegie Mellon is mentioned as an example of an environment that produces positive outcomes. It is interesting to note that Lenore Blum, one of the early presidents of AWM, is currently a professor in the computer science department at Carnegie Mellon. There she was instrumental in developing programs that increased

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the diversity in computer science and was honored, in part for that work, as a recipient of the 2004 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring.

Mentoring is suggested as an important means of support. Here I was surprised that MentorNet, an organization designed to do just that, is nowhere referenced in this volume. Recipient of a U.S. Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring, this organization, originally founded by Dr. Carol Muller in 1997 to help women engineers, describes its mission as "to further the progress of women and others underrepresented in scientific and technical fields through the use of a dynamic, technology-supported mentoring network."

The fourth and final section of the book consists of the biographies of three women involved in science who, in the opinion of the author, have not received the attention they deserve, namely the mathematician Sophie Germaine; Mileva Maric Einstein, mathematician/physicist (first wife of Albert Einstein); and Rosalind Franklin, biophysicist. Of these three, I found the inclusion of Mileva Einstein particularly interesting as I strongly doubt she would have been included had she not been the wife of an eminence such as Einstein. An online biography refers to this woman as one who excelled at mathematics and physics, "one of the greatest scientific minds of the twentieth century." However there

Sonia Kovalevsky High School and Middle School Mathematics Days

Through a grant from the National Science Foundation (NSF), the Association for Women in Mathematics expects to support Sonia Kovalevsky High School and Middle 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 female high school or middle school 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 transitions between middle school and high school mathematics and 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 middle schools and high schools in their area.

AWM awards grants ranging on average from $1500 to $2200 each ($3000 maximum) to universities and colleges. Historically Black Colleges and Universities are particularly encouraged to apply. Programs targeted toward inner city or rural schools are especially welcome.

Applications, not to exceed six pages, should include:

- 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;
- plans for activities, including specific speakers to the extent known;
- qualifications of the person(s) to be in charge;
- plans for recruitment, including the securing of diversity among participants;
- detailed budget (Please itemize all direct costs in budget, e.g., food, room rental, advertising, copying, supplies, student giveaways. 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.);
- local resources in support of the project, if any; and
- tentative follow-up and evaluation plans.

Organizers should send announcements including date and location of their SK Days to the AWM web editor for inclusion on the AWM website. If funded, 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, whichever comes first. Reimbursements will be made in one disbursement; no funds may be disbursed prior to the event date. The annual fall deadline is August 4, with a potential additional selection cycle with a deadline of February 4.

AWM anticipates awarding 12 to 20 grants for Fall 2011 and Spring 2012. Applications must be received by **August 4, 2011**. Decisions on funding will be made in late August.

Applications materials shall be submitted online. See the AWM website at www.awm-math.org for application instructions. Applications by mail or fax will not be accepted. For further information, call 703-934-0163, email awm@awm-math.org, or visit www.awm-math.org/kovalevsky.html.

are no publications under her name that support this. Peter Frize hints that Mileva was not properly credited with important work attributed to Einstein alone. Much of this dispute seems based on love letters discovered in 1986 and published in 1992, written when the two were still together. It is one of these letters that seems to have caused the greatest controversy, in particular, the sentence "I will be so happy and proud when we can bring our work on relative motion to a successful conclusion." Some authors cite this, for example, as suggesting active collaboration. Others dismiss the "we" as the royal "we." All this echoes stories we hear from earlier times about women who were not appropriately credited when working with men. That indeed is the well-documented story of Rosalind Franklin who was not properly credited with her role in the major scientific discovery of the double helix. Whether this is the case with Mileva Einstein, I don't really know.

Summing up: *The Bold and the Brave* is a rich presentation of the history of attitudes about women's abilities, their education, and their achievements in the ages of science, both early and modern. The third section, Education and Careers in Science and Engineering, deals with issues and events closer to the author's background and is quite different in tone. In a way, as noted above, the author has written and combined here several different books. Perhaps she would have been better served by presenting this third section with its attendant second appendix as a separate volume or monograph. I particularly recommend the epilogue, which seems to weave a net around the entire enterprise, and, in a way, pulls it all together after all.

And finally, if you're short on time and don't mind missing the "juicy" parts, one could do far worse than read only the preface, epilogue and appendices of this dense volume, thus gaining much of the important information and arguments … and some extra time as well.

Math Equals

Teri Perl's book *Math Equals* was recently remaindered, and she bought the remaining supply from her publisher. She would be happy to sell a classroom set of copies to any school interested in buying them, for $2.00 per copy (minimum of 20 copies) plus shipping or $3.00 per copy (2–19 copies) plus shipping. Individual copies are available for $4.00 plus shipping. Email Perl at TeriPEd@aol.com to place an order. Perl will donate half the profits to each of AWM and Expanding Your Horizons.

Math Equals includes informative and fascinating biographies of nine women mathematicians from the 4th century through the 20th century whose work was done in the areas of number theory, calculus, topology, and abstract algebra. In 1982, *Math Equals* was cited by the American Library Association's *Choice* magazine for its outstanding contribution to mathematics. The book is especially interesting and useful in middle school since each biography is accompanied by a math enrichment activity that relates, in some way, to the area of mathematics where the women made their contributions.

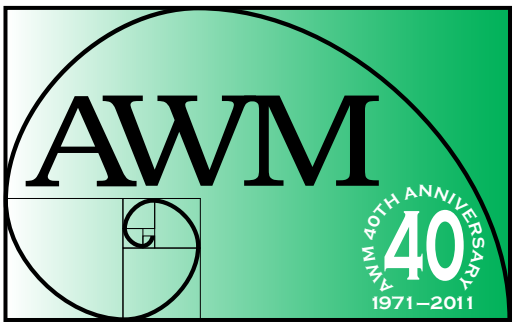
CALL FOR NOMINATIONS:

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, 2011. 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 Boston, MA, January 2012.

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, recommendation letters from professors, colleagues, etc.) should be enclosed with the nomination. Nomination materials for this award, with the exception of transcripts, should be sent to www.awm-math.org. Transcripts should be mailed 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, 2011**. If you have questions, phone 703-934-0163, email awm@awm-math.org, or visit www.awm-math.org.



ASSOCIATION FOR
WOMEN IN MATHEMATICS

CELEBRATE!

40 Years and Counting: 2011 is AWM's 40th Anniversary Year!

We hope you and your colleagues will join us for these AWM anniversary events:

AWM 40th Anniversary Embedded Meeting at ICIAM 2011, Vancouver, BC, July 18–22, 2011

Monday, July 18

10:00 a.m. – 12:00 noon
Women at the Forefront of Applied Mathematics

1:30–2:20 p.m.
Panel: Institutional, Professional and Research Leadership

3:00–5:00 p.m.
Workshop: Opportunities beyond Academia

8:00–9:00 p.m.
AWM-SIAM Sonia Kovalevsky Lecture

Tuesday, July 19

10:00 a.m. –12:00 noon
Workshop: Research Talks by Recent Ph.D.'s I

3:00–5:00 p.m.
Workshop: Research Talks by Recent Ph.D.'s II

6:00–8:00 p.m.
Workshop: Graduate Student Posters

MathFest, Lexington, KY, August 4–6, 2011

Friday, August 5

8:00–8:25 a.m.
AWM-MAA Coffee Reception

8:30–9:20 a.m.
AWM-MAA Etta Z. Falconer Lecture

1:00–2:30 p.m.
Poster Session: Celebrating AWM Student Chapters

Saturday, August 6

2:40–4:00 p.m.
Panel: Moving up the Career Ladder in Academia

CELEBRATE!

The grand finale event will be

40 Years and Counting: AWM's Celebration of Women in Mathematics, Brown University, September 17–18, 2011

- **ORGANIZERS:** **Georgia Benkart**, *University of Wisconsin-Madison*
  Kristin Lauter, *Microsoft Research*
  Jill Pipher, *Brown University and ICERM*

- **PLENARY SPEAKERS:** **Andrea Bertozzi**, *UCLA*
  Laura DeMarco, *University of Illinois at Chicago*
  Barbara Keyfitz, *The Ohio State University*
  Hee Oh, *Brown University*

- **SPECIAL SESSIONS on a wide-range of topics in pure and applied mathematics and math education:**
  including Algebraic Geometry and Commutative Algebra, Combinatorics and Graph Theory, Conservation Laws, Cryptography, Geometric Group Theory, Geometry of Flag Manifolds, Group Theory and Representation Theory, Homotopy Theory, Mathematical Biology, Mathematics Education, Model Theory, Nonlinear Dynamics, Nonlinear Wave Phenomena, Number Theory, Numerical Methods and Scientific Computing, Probability, Riemannian Geometry, and Symplectic Geometry

- **PANEL**

- **BANQUET**

- **POSTER SESSIONS:** for early career mathematicians

Please visit http://sites.google.com/site/awmmath/awm40events for details on registration, housing, and the special sessions, and to apply to present a poster.

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AWM 40TH ANNIVERSARY 40 1971–2011

ASSOCIATION FOR WOMEN IN MATHEMATICS

In celebration of its 40th anniversary, the Association for Women in Mathematics calls for junior women to make poster presentations for the 40 Years and Counting: AWM's Celebration of Women in Mathematics conference to be held at Brown University, September 17–18, 2011.

Partial support is available for women graduate students and recent Ph.D.'s.

Submit poster and funding applications online by July 31, 2011 to http://www.awm-math.org/awm40posters.html.

EDUCATION COLUMN

Assessing the Impact of Assessment

Ginger Warfield, Emerita, University of Washington

A year ago I decided that this column should address the issue of evaluation and assessment. Accordingly, I have spent the intervening months alternately thinking "Ah, *that's* an idea I need to include" and "Oh, *there's* an article I need to read more thoroughly." Came the time to face the keyboard I found myself with a buzzing cloud of ideas and the dawning realization that it would take five pages in three-point font to begin to pursue them all. This in turn led to the question: "Why should a mathematician reading this newsletter be interested in the diatribe you are contemplating producing?" And in turn, "What got you so interested, anyway?" Those questions made a lot of sense, and so I will devote most of the column to retracing the process that generated my convictions. With maybe a little diatribe at the end.

I grew up surrounded by mathematicians, never considered any major but mathematics, and had the good fortune to complete a doctorate in mathematics at Brown University. Teaching was always an interest, but a secondary one. Then somewhere post-degree it burst into the lead and began dominating my career. I was involved in teaching developmental courses at the university, then in teaching graduate students to teach those courses, then in teaching future elementary teachers, then in professional development for all teachers. A couple of decades into this I decided to broaden my horizons and began attending MER (Mathematicians and Educational Reform) workshops. At the first one I attended one of the optional break-out sessions was on assessment, and I was nonplussed that anyone would choose it—what's the fun of that?

Somewhat later, after I had begun to deal a little more with teachers and the whole K–12 system, I attended another MER workshop. This time I opted firmly for the session on formative and summative assessment. Given that the response of the sprinkling of fellow mathematicians in attendance was to quirk their eyebrows and refer to the f-word and the s-word, this might be a useful time to throw in a definition or two: at the undergraduate level, assessment is done by giving tests—an activity that few of us enjoy. The outcome is a grade for the students. If a large portion of the class does badly we sometimes manage not simply to blame them, but to think about ways to teach the topic more clearly—to the next class. It is very rare for the outcome of an assessment to have any impact on how we teach the students whom we just assessed. This is a prototypical summative assessment. Formative assessment, on the other hand, has a different mission. Its objective is to help the teacher ascertain what has been learned and what gaps remain, and determine how best to use the former to address the latter. In a graduate seminar this can happen informally and continuously. Likewise in elementary school it can do so, at least in the subjects on which the teacher is securely knowledgeable. But as classes get larger, with more and more mainstreamed English Language Learners and Special Education students, even elementary school teachers have trouble staying in touch with individual learning. Easily administered formative assessment for them and for secondary teachers can be invaluable.

About the time I was taking this in, I also began learning about yet another type and level of assessment taking place in my own state of Washington. It was by now the late nineties, and along with many states, Washington had responded to the federal mandate to produce state standards and an assessment to go with them. What impressed me was that instead of designing standards with testability in mind, the folks who took on the project first asked themselves what was really important to them. Once they decided that problem-solving and reasoning and ability to make good use of the (also important) tools of mathematics were central, they wrote standards based on that decision. After that, they set about to design a test whose use would be not to zap an individual student who did badly or even to point a finger at a school with low scores, but to assess as a state what progress was being made towards meeting those standards. In particular, the test-writers faced the fact that multiple choice questions serve only to monitor tool acquisition and included questions where students had to justify their answers, using words or diagrams or sequences of equations, and others where students were presented with a situation or problem that couldn't be solved by blind application of practiced tactics. The test was cumbersome and expensive, but a teacher who figured out (as teachers must do) how to genuinely teach to it was making exactly the mathematical progress the standards were aiming for. There were flaws in the standards and in the implementation (that's another column), but the basic concept and a huge amount of the work were outstanding, and I remain proud to have been even peripherally involved in them.

As I was arriving at some understanding of my state's standards and assessment I ran into another view. It came in a rousing and very well received speech by Rudy Crew,

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who had won great acclaim for his work as Chancellor of the New York City Board of Education. His basic tenet was that the education system had long led too sheltered a life and needed to be treated like any other factory, with regular testing to insure a high quality end product. The image produced in my mind of a conveyor belt full of little containers into which dipsticks were periodically to be stuck chilled and depressed me. It should have terrified me. Crew was not the only one with that perspective. The school-as-a-factory view swept the country and within a few years brought us the No Child Left Behind Act, often referred to as the No Child Left Untested Act. High stakes tests were required, and it was required that their use be almost exclusively punitive. Schools whose dipsticks failed to show enough oil were to be shamed and disgraced. Parents were to be encouraged to remove their children from such schools and leave the schools high and dry.

With the change in administration there was a brief hope of improvement. The prose got distinctly better, with comments about encouraging good teaching, not merely punishing perceived bad teaching. Unfortunately the power of the test has if anything increased. Now it is not just schools that are affected by test scores. Teachers in many states are being examined for "value added": if the sum of the dipstick levels at the end of the year is not enough higher than the sum of the dipstick levels at the beginning, it must be the teacher's fault. These bad, irresponsible teachers must be gotten rid of to make way for the hordes of knowledgeable, skilled and highly educated folks who are pounding on the door in search of a job for which the demands are huge, the pay is poor and they will be the scapegoats for anything that goes wrong.

Sorry—the diatribe snuck up on me. I shall round it out with a quotation and a citation, then return to less thorny ground. We are not, in fact, alone in this testing mess. Guy Brousseau, noted French mathematics education researcher, was recently interviewed on the subject of standardized testing. After he had fumed at some length, the interviewer was led to suspect that he condemned all "mass evaluation." "Certainly not," he replied, "Society has the right to evaluate what interests it, but it should be warned when the thermometer that it is using may kill the patient, especially if reading the thermometer gives no useful information."[1] My citation, with more data, albeit a little less picturesque language, is a book written by Nichols and Berliner in 2007 and published by Harvard Education Press: *Collateral Damage: How High-Stakes Testing Corrupts America's Schools.*

I will finish on a less strident, but nonetheless urgent, note. As most of you are probably aware, we are in the midst of a new development on the national educational front. At the behest of the governors of a collection of states, Common Core Standards have been written and are in the process of being adopted by most states. They were produced by a strong and hard-working writing group that was remarkably responsive to masses of feedback. To most of us who have been toiling in this field, they look pretty encouraging. Now the effort is turning to production of what gives the Standards their impact: assessments. Two different consortia have been funded to produce assessments. Furthermore, returning to an earlier topic, their mandate includes producing not just summative but formative assessments. In other words, assessments that are not simply used to zap the students and teachers if some quantity of information is not demonstrated, but to give the system at large and the teachers in particular the wherewithal to recognize the strengths and weaknesses in students' learning as it is happening, to apply that recognition to teaching and thereby to improve learning.

This is an exciting development, and I believe it is calling forth major good-faith efforts. So why my sense of urgency? Because the facts that the effort is so massive and that the idea of formative assessment is generally not a familiar one, combined with the current testing climate, are going to produce a huge pressure to create not a collection of small and applicable formative assessments but a whole set of a miniaturized dipsticks. The process is supposed to be a pretty open one, and I think we should all be keeping an eye on it. We have the possibility of some genuine forward movement on our testing front, but to aid it we must all maintain a high state of dipstick vigilance!

[1] Personal translation of personally transmitted transcript.

Race to the Top

The U.S. Department of Education says: "The $350 million Race to the Top Assessment program, part of the American Recovery and Reinvestment Act (ARRA), is intended to develop new assessment systems aligned with the common core standards.… PARCC and SMARTER Balanced, which together comprise 45 states plus DC, are dedicated to building new comprehensive assessments in English language arts and mathematics in grades 3 through 8 and high school that will be operational as early as the 2014–2015 school year." Search on "race to the top" at www.ed.gov for further info.

A Career of Mathematics in Government: Ruth Stauffer McKee

Pat Kenschaft, Professor Emerita, Montclair State University

Note: *This article was written in 1992 and lost until recently. The interview on which it is based took place the summer before Dr. McKee died on January 3, 1993. Statements about the Pennsylvania pension system are, of course, out of date.*

"I like mathematics, but I don't want to be a teacher or a computer programmer. What else can I do with mathematics?"

The career of Ruth Stauffer McKee (1910–1992) provides one answer to that question. Although her doctoral degree was in abstract algebra, she used her mathematical skills and her title in solving political problems for the Pennsylvania legislature. She had many assistants whose careers suggest possible paths for people with less impressive credentials who know some serious mathematics.

McKee was employed by the Joint State Government Commission of the Commonwealth of Pennsylvania. Thus her paycheck was independent of politics, enabling her contemplations to be nonpartisan. She could and did evaluate similar legislation proposed simultaneously by each party, computing how much each would actually cost and accomplish. Although sometimes she felt frustrated when her findings were ignored, she also remembers numerous occasions when her analysis had an impact on subsequent legislation.

She was the only American doctoral graduate of the great mathematician Emmy Noether, who is often considered the founder of modern algebra. Her mentor had trained her to look at problems from many angles, questioning all assumptions. Although the skills needed to devise formulas to evaluate traffic violations or distribute pensions are not identical to those involved in constructing a normal basis of a Galois field (her dissertation topic), the similarities are significant. In both government and operator isomorphisms she would concentrate on details while continuing to contemplate important questions. "What precisely do we need to know? What questions must we ask? How do we check ourselves?"

For example, in setting up one of the original traffic point count systems, many questions had to be answered before decisions could be made. What misdemeanors actually cause accidents? How serious are the accidents associated with each type of behavior? How do we assign weights for the relative dangers? She obtained and studied the records of many, many accidents. Related questions involved the physical condition of people involved in accidents. How many had heart attacks? How many had poor eyesight? How "poor"? Does diabetes or epilepsy contribute to accidents? She discovered that doctors don't always report the whole truth; the patient is their

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CALL FOR NOMINATIONS:

The 2013 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, Karen Vogtmann, Audrey Terras, Fan Chung Graham, Barbara Keyfits, Carolyn Gordon and Susan Montgomery. Barbara Keyfitz will deliver the 2012 lecture.

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. Nomination materials for the Noether Lecture shall be submitted online. See the AWM website at www.awm-math.org for nomination instructions. Nominations should be sent by **October 15, 2011** to awm@awm-math.org. If you have questions, phone 703-934-0163 or email awm@awm-math.org.

customer. Eventually physical examinations were instituted. I asked if it was a result of her work. "Well, we like to think so. Sometimes it's a long time from the first findings to legislation. But we planted the seeds."

Her team was consulted when the legislature wanted to know why some mental hospitals return patients to society quickly and others keep them forever. Clearly, those that keep the patients until they die cost the state (or whoever pays the bills) much more per patient. What differences among mental hospitals influence the length of patient confinement? McKee visited the state mental hospitals, watched how they were operated, collected financial data, and took samples of patient histories. She discovered that those that simply absorbed patients had a set pattern for handling them. The effective hospitals kept trying different techniques and had more specific records of how patients reacted, how long they remained, and whether they returned, so that the personnel could learn from their experiences. These hospitals emanated a feeling of hope both in their decor and in the behavior of their staff. "There was one with light and cheerful paintings made by the patients on the walls, and the whole atmosphere was one of hope."

She remembers one day when she and another woman became lost while driving toward one of the more hopeless mental institutions. A policeman stopped them and asked where they were going. They told him. "He nearly died. He got us on the road fast!" McKee's jolly laugh pealed forth as she remembered the incident.

Another project was comparing the faculty workloads and salaries offered at Temple University, the University of Pittsburgh, Pennsylvania State University, and Lincoln University. She was assigned the task of analyzing the number of students and courses taught at the four institutions and then drafting a bill for distributions of state appropriations. The universities were required to submit complete data for all members of the faculties. "Huge stacks" of responses arrived. Inconsistent data were questioned and corrections were made. "Sometimes a school would try to look better than it was. But attempts to manipulate the data often backfired. As the university administrators worked with us, they realized they didn't know what 'good' data was, and they might as well come as near to the truth as they could."

She and her staff "plowed through" the data, and then they wrote detailed reports. She chuckled as she remembers how people doubted that they actually could use so much information. "The administrators were dumbfounded!" The commission learned that the average work week of the faculty at each institution is about fifty hours (although one person's reported working hours totaled more than the number of hours in a week). The faculty time required per student increases greatly as the student advances. Her staff evolved a formula for financing the schools on the basis of student credit hours at four levels, lower and upper undergraduates, master's, and doctoral students.

One of the legislators was so pleased with the study of universities that he asked for a similar study of the fourteen state colleges. Such legislation was passed and annual reports are made of each of the state owned colleges and the state related universities. Annual analyses now are produced by the commission, providing the legislators with a basis for determining the distribution of appropriations. The commission now has collected data over a ten year period.

Planning a more equitable tax system generated another enormous project. The school districts' parts of school costs have been covered mostly by real estate taxes, "but assessed values, the basis for these taxes, are not changed as often as they should be." Old people had high taxes when their houses were no longer as valuable as they had previously been. A proposed substitute was the income tax, which would shift with the ability of the tax payer to pay.

Similarly, the state's share of costs for public education formerly had been based principally on the real estate *wealth* of the school district per student. McKee feels it is fairer to consider the school district's *income* per student. She devised a plan for gradually shifting part of the school tax base from real estate to income taxes while simultaneously shifting the state reimbursement to an income based formula. She believes that the present formula now involves both real estate value and income.

One of her early projects was studying the life expectancy of a small business. "It is horrifying how many small businesses go out of business in a very short time! And pension systems! Even at the beginning of my employment, I was analyzing pension systems of private companies, finding what they provided under what conditions." The legislators wanted to know how the public pension systems compared to the private ones. It was tedious work, studying each pension plan to discover under what conditions benefits were paid and how the size of the benefit was determined. At first she had to do all the investigative detail work. As she became more experienced, she was able to hire others to help with the repetitive work and concentrate more on making decisions and managing.

Later she and a lawyer, Howard Bozarth, were given responsibility for drafting a recodification of the pension

system for the state employees and the public school employees. Together McKee and Bozarth restructured the entire state employees code. They also consulted with firemen who belonged to a municipal retirement system. The firemen wanted an automatic cost of living increase, but she convinced them that the expense would be like buying a new house every year, and neither they nor the municipality could afford it. She notes with satisfaction the financial stability of the Pennsylvania pension system. Less happily she recalls that Bozarth's untimely death occurred just after the state employees code became law, so that his family was one of the first affected by his foresight.

McKee's mathematical education enabled her to openly challenge the statements of the actuaries as few others dared. If a model did not seem appropriate to her, she would derive her own. The response was sometimes near outrage. "You can't do that! It's not in any book!" But her results were respected. Once a legislator commented to another that they would have to hire some actuaries to answer an especially difficult question. "Ask Dr. McKee," was the response. "She can do it!"

Ruth Stauffer was born in Harrisburg, Pennsylvania, on July 16, 1910, the middle child of a physician. For many years she wanted to be a doctor also; she was fascinated with the way the eyes and ears work. Her father was not eager for her to go into medicine. It was "verboten" for a doctor's daughter to become a nurse, but he didn't actively discourage her from following his own footsteps.

After her graduation from a public high school in Harrisburg before her sixteenth birthday, she took an extra year of study at the high school before entering Swarthmore College. There she found she would struggle for a C in biology or physiology, but an A in mathematics came easily. Both the pre-med department and Arnold Dresden, head of the Swarthmore mathematics department, urged her to change her major to mathematics. Disappointed that she did not seem to have what seemed to be needed for a career in medicine, she "just rode the current," and followed their suggestion.

Dresden suggested that she apply for a scholarship for graduate study at Bryn Mawr College, which she won. She began graduate study immediately following her college graduation in 1931 and found the enthusiasm of Marguerite Lehr especially inspiring. She also was glad to study under Gustav A. Hedland, William Flexner, and the department head, Anna Pell Wheeler.

Her family contributed to her first year at Bryn Mawr, but the next year she returned with $50, determined to earn her own way aided only by a scholarship. Although her father could have afforded to pay her expenses, he was not sufficiently enthusiastic about her going to graduate school to do so. She reflects now that if he had supported her, she might not ever have finished the degree. "You learn to use your time," she believes, when it is important to do so. "It's amazing how you can earn your way, I think, even today, if you really want to." At first she worked in a tea room, making tea sandwiches, waiting on tables, and even changing diapers.

When Professor Wheeler discovered what she was doing, she was "so annoyed. I have a job for you!" she exclaimed. McKee had a similarly varied set of jobs for her new employer, including polishing silver and washing dishes, but also reading student papers and learning the art of reading critically.

By the time Emmy Noether arrived from Hitler's Germany in the fall of 1933, McKee had completed her basic graduate courses. Working with Noether was exciting and changed her life. Noether signed her dissertation, *The Construction of a Normal Basis in the Separable Normal Extension Field,* just before entering the hospital for the operation from which she would never return. McKee's doctoral examination was conducted with the assistance of Richard Brauer of the University of Toronto. She received her doctorate in the spring of 1935, shortly after the sudden death of Emmy Noether.

After earning her doctorate, she taught for one year at the Bryn Mawr School in Baltimore while taking a course under Zariski at Johns Hopkins University, and the following year she taught at Miss Fine's School in Princeton. That year she spoke at the Institute for Advanced Study about her dissertation for a couple of weeks and regularly attended seminars there. In 1937 she married George McKee, a lawyer whom she had begun to see six years before when he was a law student at the University of Pennsylvania. His practice was in Harrisburg, but once a week she took the train to teach a seminar at Bryn Mawr. She also worked independently on research until she became pregnant. She has two daughters. Both were English majors and each has two children now. One works in religious education and the other teaches emotionally disturbed children and writes.

It was on a Girl Scout trip in 1953 that she discovered the job opening that would develop into her fascinating career. One of the Girl Scout leaders was an office administrator of the Joint State Government Commission for the state of Pennsylvania and mentioned that they were looking for a mathematician. "I could do some part time work," she replied.

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The leader was startled. "Are you a mathematician?" she exclaimed.

"Yes."

"Do you mean you majored in math?"

"Yes."

"And then she was all excited, so she told her boss, and he called me in. 'What we really need, he said, is a statistician.' In those days we stuck up our noses at statisticians. I said, 'I'm sure I could pick that up.' " She laughs as she recounts the story. She applied for a part time job, got it, and soon was involved in a challenging career.

Ruth McKee strongly feels that more people trained in mathematics should be helping governments choose their policies. Now that she is retired, she hopes that her example may motivate others to study mathematics in preparation for a stimulating, satisfying career in government. She believes that all levels of government need more people accustomed to the probing, detailed, and abstract patterns of thinking that serious pursuit of mathematics stimulates.

In Memoriam

Joan Jennings Bartik

Northwest Missouri State University, March 2011

Jean Jennings Bartik, who was Northwest Missouri State University's only female math major when she graduated in 1945 and went on to become one of six female computers chosen to program the world's first electronic computer, has died, the University learned on March 23, 2011.

Bartik passed away that morning at a rehabilitation facility in Poughkeepsie, N.Y., where she was recovering from a stroke. She was 86.

Raised on a farm near Stanberry, Bartik graduated from Stanberry High School in 1941 at the age of 16 and attended Northwest Missouri State Teachers College, now Northwest Missouri State University.

After her graduation, she was recruited by the U.S. Army as a human "computer" to hand calculate the firing trajectories of artillery during World War II. Working in an old fraternity house at the University of Pennsylvania, she earned $2,000 a year and an additional $400 for working on Saturdays.

Months later, in the fall of 1945, Bartik was among six women computers chosen to program the Electronic Numerical Integrator and Computer, or ENIAC. Though she was initially selected to be an alternate, other women declined the offer, and at age 20 Bartik was the youngest woman to participate in the ground-breaking project.

The ENIAC was intended to automate the trajectory calculations the female computers performed by hand. At 100 feet long, 10 feet high and built with 17,480 vacuum tubes, the ENIAC occupied a basement room the size of a small gymnasium in the Moore School of Electrical Engineering at the University of Pennsylvania. Bartik and her coworkers broke down complex equations into their smallest possible components, calculating the route to be performed in sequence at a rate of 5,000 additions per second.

Later, she helped program the BINAC and the UNIVAC, the world's first commercial computer. After taking time off to raise her family, Bartik worked positions in technology-related publishing and marketing. She also sold real estate.

In 1997, Bartik and her fellow programmers were inducted into the Women In Technology International Hall of Fame. In 2008, the Computer History Museum in Mountain View, CA, presented Bartik with its Fellow Award, enshrining her in the CHM Hall of Fellows.

Bartik, who visited Northwest frequently, was on hand in the spring of 2002 as the university dedicated its Jean Jennings Bartik Computing Museum. Also in 2002, she delivered the University's commencement address, receiving a standing ovation from the audience, and was awarded an honorary doctorate from Northwest. In the fall of 2007, she returned to Northwest as the Homecoming Grand Marshal.

Dr. Jon Rickman, vice president of information systems at Northwest and director of the Jean Jennings Bartik Computing Museum, said Bartik has left an important legacy in the programming industry as well as at Northwest Missouri State.

"Today there are over 1.4 million programmers and software developers in the United States, and Jean Jennings Bartik was the first," Rickman said. "I've enjoyed working on the creation of the Jean Jennings Bartik Museum here at Northwest Missouri State University. It has been an honor to help Jean complete her autobiography and watch her join the Hall of Fellows at the Computer History Museum."

In a July 2001 cover story for the *Northwest Alumni Magazine,* Bartik said, "I want to be remembered as a lucky person who was in the right place at the right time to be a pioneer in the computer business. The only characteristics I have are a sense of adventure, believing I can do anything and knowing to open the door when opportunity knocks."

Notes

See http://www.nwmissouri.edu/media/news/2011/03/23bartikpassing.htm for this press release and links to photos and further information on Bartik. See http://articles.cnn.com/2011-03-23/tech/computers.bartik.obit_1_eniac-john-mauchly-electronic-numerical-integrator?_s=PM:TECH for another obituary, and see http://www.cnn.com/2011/TECH/innovation/02/08/women.rosies.math/index.html?iref=allsearch for "Rediscovering WWII's female 'computers'," a review of *Top Secret Rosies.*

AWM Workshop for Women Graduate Students and Recent Ph.D.'s at the 2012 Joint Mathematics Meetings

Application deadline: **August 15, 2011**

Supported by 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. We have received support from the National Security Agency for the AWM Workshop to be held in conjunction with the Joint Mathematics Meetings in Boston, MA in January 2012.

FORMAT: Up to 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 dinner with a discussion period, a luncheon, and a panel discussion on areas of career development. Workshop 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 talks, posters, and panel. Departments are urged to help graduate students and recent Ph.D.'s who are not selected for the workshop to obtain institutional support to attend the presentations and panel.

ELIGIBILITY: Applications are welcome from graduate students who have made substantial progress towards their theses and from women who have received their Ph.D.'s within approximately the last five years, whether or not they currently hold a postdoctoral or other academic position. Women with grants or other sources of support are welcome to apply. All non-US citizens must have a current US address.

All applications should include:

- a cover letter
- a title of the proposed poster or talk
- an abstract in the form required for AMS Special Session submissions for the Joint Mathematics Meetings
- a concise description of research
- a curriculum vitae
- 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.

Applications (including abstract submission via the Joint Mathematics Meetings website) must be completed electronically by **August 15, 2011**. See http://www.awm-math.org/workshops.html.

AWM CHAPTERS

Student Chapters Poster Session

In celebration of its 40th anniversary, the Association for Women in Mathematics will showcase its student chapters from colleges and universities across the U.S. and their many outreach activities that encourage women and girls to study and have careers in mathematics. This poster session will bring together student chapters, AWM members, and the broader mathematical community to discuss mathematics, exchange ideas for activities, and build friendships and mentoring relationships.

- **MathFest 2011!**
- **Share your chapter's activities!**
- **Abstracts due June 10**
- **Questions? Contact Maia Averett at maverett@mills.edu.**

Submit poster proposals online by June 10, 2011 to **http://www.maa.org/mathfest/abstracts.html**.

Awards at the JMM

Ingrid Daubechies, Nicolas Falacci and Cheryl Heuton, Erica Flapan, Jenny McNulty, Maria Monks, Karen Rhea, Zvezdelina Stankova, and Amie Wilkinson received awards from organizations other than AWM at the Joint Prize Session at the Joint Mathematics Meetings in San Francisco, CA in January. Congratulations to all! The citations and responses below are reprinted from the prize booklet (see "January 2011 Prizes and Awards" online at www.ams.org/ams/prizebooklet-2011.pdf).

Haimo Awards

In 1991 the Mathematical Association of America instituted the Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching of Mathematics in order to honor college or university teachers who have been widely recognized as extraordinarily successful and whose teaching effectiveness has been shown to have had influence beyond their own institutions. Deborah Tepper Haimo was president of the Association, 1991–1992.

Citation for Ileana Streinu

Erica Flapan, Lingurn H. Burkhead Professor of Mathematics at Pomona College, has been teaching at the collegiate level for more than 25 years, nearly all of them at Pomona. Professor Flapan's outstanding teaching was recognized earlier with awards before her Ph.D. and as a postdoctoral fellow, and also more recently as the recipient of the 2005 Irving Foundation Distinguished Faculty Fellowship for mentoring students of color at Pomona, and the 2010 Southern California–Nevada Section Award for Distinguished College or University Teaching. She is best known for her dynamic, energetic classes that foster the participation of all students in the room. Students at all levels and with a variety of disciplinary interests have benefited from Flapan's interest and excellence in teaching. For example, she was co–principal investigator for a grant to bridge mathematics and chemistry at Pomona; this helped to fund the creation of an Advanced Problem Solving course designed to give aspiring chemistry students needed mathematical strengthening as well as three other projects from the beginning of the chemistry curriculum to the end. Her work in connecting mathematics and chemistry is further illustrated by her widely acclaimed book *When Topology Meets Chemistry: A Topological Look at Molecular Chirality* (Cambridge University Press and the Mathematical Association of America, 2000).

Professor Flapan's influence goes far beyond the classrooms of Pomona to include teaching in several summer programs aimed at broadening the interest in advanced mathematics among high school and undergraduate students and encouraging them to pursue graduate degrees. According to program organizers, Erica Flapan has been extraordinarily successful at engaging students in the Mills Summer Math Institute, the Carleton College Summer Mathematics Program for Women, the Canada/USA Mathcamp, and the Park City Mathematics Institute Undergraduate Program. She is known for her dedication to the mathematical growth of her students and for her impact in their mathematical lives and careers. Her colleagues and students say that she serves both as a formal and informal advisor to many students; she is known as a tireless advocate and strong voice in support of diversity.

It is a pleasure for the Mathematical Association of America to recognize Professor Erica Flapan with the Haimo Award for her outstanding leadership and work related to the teaching of mathematics and the mentoring of students in whatever context she meets them.

Biographical Note

Erica Flapan, the Lingurn H. Burkhead Professor of Mathematics at Pomona College, received her B.A. from Hamilton College in 1977 and her Ph.D. from the University of Wisconsin at Madison in 1983. Before coming to Pomona College, she was a G. C. Evans Instructor at Rice University and a visiting assistant professor at the University of California at Santa Barbara. Her research interests are in low dimensional topology and its applications to chemistry and molecular biology. She wrote *When Topology Meets Chemistry,* for upper level undergraduates, and she has recently co-authored a book (together with James Pommersheim and Tim Marks) entitled *Number Theory: A Lively Introduction with Proofs, Applications, and Stories* (John Wiley & Sons, 2010) for students who have not yet been exposed to proofs.

Response from Erica Flapan

I am deeply honored to receive the Haimo Award and touched to have been nominated by former students who are now mathematicians themselves at impressive places like Mount Holyoke College, Imperial College London, Carleton College, and the Rand Corporation, among other places. I am lucky to have had bright, motivated students like these who have inspired me year after year to strive to be a better teacher. In addition, I am grateful to the Pomona College Mathematics Department for giving me unusual freedom to explore different teaching methods and course content as well as to

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create new courses. I also want to thank Deanna Haunsperger and Stephen Kennedy at Carleton College for designing and flawlessly directing the Summer Mathematics Program for Women, where I have taught regularly and have become a part of a dynamic community that mentors and encourages talented young women to become mathematicians. Finally, I want to thank my husband, Francis Bonahon, who listens tirelessly to my stories about teaching and to our daughter, Laure Flapan, who never lets me forget the student perspective.

Citation for Karen Rhea

Karen Rhea has been a faculty member in colleges and universities for about 30 years, the last decade at the University of Michigan. In 1998, while a professor at the University of Southern Mississippi, she was awarded the MAA Louisiana-Mississippi Section's Award for Distinguished College or University Teaching of Mathematics.

At the University of Michigan, Karen is director of the Introductory Program, which serves about 4500 students annually in pre-calculus and the first year of calculus and is widely viewed as one of the most successful programs of its scope in the country. Karen's work with the Introductory Program helps to address the problem of creating and maintaining an environment in which each of thousands of individual students with different instructors can be inspired to do their best work. One of the most important parts of her work is running, at the beginning of each academic year, an intense training week for all new instructors for the Introductory Program. She, along with many seasoned teachers, works to produce confident, prepared, and effective teachers. Recognizing that effective teaching is not "one size fits all," Karen is praised for helping instructors find their own voice. Maintaining an open door policy, she continues to work with these instructors, offering them advice and guidance and mentoring them long after they leave the program. Since many of the instructors she works with go on to become faculty elsewhere, her influence on mathematics instruction is much broader than just in her own classes at Michigan; she also inspires others to teach well.

Her students praise her also, saying that her enthusiasm and eagerness to teach make class interesting and that she presents the material as clearly as possible. Karen Rhea has contributed to the general development of the calculus curriculum and to the discourse on how to teach calculus effectively through her work with the Harvard Calculus Consortium. Not only has her work made significant contributions to the content of the introductory courses at Michigan, her work has contributed to the development of a calculus curriculum that aims to get students actively involved in their own learning throughout the country.

It is a pleasure for the Mathematical Association of America to recognize Professor Karen Rhea for her outstanding work in teaching, her contributions to changes in the calculus curriculum nationally, and her work inspiring and developing other outstanding teachers.

CALL FOR NOMINATIONS:

The 2012 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, Lai-Sang Young, Dianne P. O'Leary, Andrea Bertozzi, and Suzanne Lenhart. This year's lecturer is Susanne Brenner.

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. Nomination materials for the Kovalevsky Prize Lecture shall be submitted online. See the AWM website at www.awm-math.org for nomination instructions. Nominations must be received by **November 1, 2011** and will be kept active for two years.

The awardee will be chosen by a selection committee consisting of two members of AWM and two members of SIAM. Please consult www.siam.org/prizes/sponsored/Kovalevsky.php and www.awm-math.org/kovalevskylectures.html for more details.

Biographical Note

Karen Rhea is Lecturer IV and Director of the Freshman/Sophomore Program at the University of Michigan. Prior to moving to Ann Arbor, she was a lecturer at the University of Southern Mississippi. She has been a member of the Calculus Consortium since its inception and has, along with members of the Consortium, been influential in changes that have taken place in calculus instruction for over two decades. She has given numerous talks and workshops, has served on the MAA Committee on Professional Development, and was recently appointed to the Committee on the Teaching of Undergraduate Mathematics. She was awarded the 2010 Matthews Undergraduate Teaching Award at the University of Michigan and nominated by the University for the Carnegie Professor of the Year Award. She looks forward to retiring soon but never intends to give up her interest in working with others. She aspires to soon become a doula.

Response from Karen Rhea

I am grateful for the sage advice, upon returning to college as an adult student, that college is for education and not training for a job. I am grateful to Gary Walls for encouraging me to pursue a graduate degree. I am most exceptionally grateful for the opportunity to know and work with the members of the Calculus Consortium—a most creative, supportive, and inspirational team. Through that association I was invited to go to the University of Michigan. There I was most fortunate to be mentored by Pat Shure, Al Taylor, and others and to step into an already established and successful program. I am thankful for the incredible collegiality and support of the faculty at the University of Michigan and for the opportunity that I have had to work with many undergraduates and with graduate students and postdocs as they embark on their careers. I am very honored to join the ranks of Haimo winners. Thanks (so very much!) to the many friends and colleagues who have supported me for this award and throughout my career.

Citation for Zvezdelina Stankova

Zvezdelina Stankova's goals in teaching are to develop students' ability to do independent thinking, no matter what the level of the student, from the middle and high school students in the Math Circles she works with through the senior undergraduate mathematics majors of Mills College and the University of California, Berkeley. In each of these arenas, she has been extraordinarily successful.

As a full time faculty member at Mills College, Stankova has also taught one course per year at the University of California, Berkeley for eleven years, and, in 1998, she founded the Berkeley Math Circle, a weekly program for 50 Bay Area middle and high school students. She has been the Berkeley Math Circle's director and a frequent lecturer since the beginning. In addition, she has been directly involved in the creation of Math Circles in seven more cities in the U.S. and Canada and has contributed to the creation of Circles in twelve other cities. It is fair to say that Zvezda is a major contributor to the success of Math Circle development throughout the United States, through her speaking, through the book (which she co-edited) *A Decade of the Berkeley Math Circle* (American Mathematical Society, 2008), and through the Berkeley Math Circle website. Stankova, with Paul Zeitz and Hugo Rossi, cofounded the Bay Area Mathematical Olympiad, an annual competition among 250 students from 45 schools in the Bay Area. Several of these students have gone on to be members of the U.S.A. Mathematical Olympiad team. Professor Stankova has been actively involved in the U.S. participation in the International Mathematical Olympiad, including being an instructor in the training camps of the USAMO. Professor Stankova's students at every level are enthusiastic about her teaching and mentoring, indicating her classes are challenging and fun. Students rave about her teaching ability, her enthusiasm for mathematics, and her capacity to dramatically change their attitudes toward mathematics and their perceptions of their own mathematical abilities.

It is a pleasure for the Mathematical Association of America to recognize Professor Zvezdelina Stankova with the Haimo Award for her outstanding work in teaching, mentoring, and inspiring students at all levels, and in leading the development of Math Circles, and promoting participation in mathematics competitions.

Biographical Note

Zvezdelina Stankova is the Rice Professor at Mills College. She was drawn to mathematics through her Math Circle in Bulgaria, consequently earning silver medals at the International Mathematical Olympiads. Zvezda completed a B.A./M.A. degree at Bryn Mawr in 1992. Her first math research in combinatorics at the REU in Duluth contributed to the Alice Schafer Prize in 1993. In 1997 Zvezda received her Ph.D. from Harvard in algebraic geometry and high school teaching certificates in Massachusetts and California. In 1998 Zvezda founded the Berkeley Math Circle (BMC). Her pioneering work inspired dozens of new circles throughout the U.S. and abroad. She trained the USA national team for six years, including 2001 when half of the team members were

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from BMC. Zvezda co-edited *A Decade of the Berkeley Math Circle—the American Experience* in 2008. Her passion to communicate mathematics was recognized through the first Henry Alder Award in 2004.

Response from Zvezdelina Stankova

I have heard of the great teachers of mathematics who have won the Haimo Award, including Joseph Gallian, my first research advisor at the REU in Duluth, who taught me anything from LaTeX to driving a car; Rhonda Hughes, my undergraduate advisor at Bryn Mawr, who recognized the seeds of teaching talent and inspired me to begin graduate studies in mathematics; Deborah Hughes-Hallett, my teaching mentor at Harvard, who looked after me while I completed the teaching certificate program; and Paul Zeitz, who supported the Berkeley Math Circle with exhilarating sessions for students and adults of all ages and backgrounds. Three more people who deserve recognition as great teachers of mathematics are Paul Melvin, my MA thesis advisor at Bryn Mawr; Joseph Harris, my algebraic geometry advisor at Harvard; and Steven Givant, my colleague from Mills College, without whom I cannot imagine mathematics or teaching mathematics at Mills. I have been very lucky to have these people with me. They remain dear friends and mentors, always. To them I dedicate this incredibly high honor of being among the Haimo Award winners. Thank you!

Ruth Lyttle Satter Prize in Mathematics

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

Citation for Annie Wilkinson

The Ruth Lyttle Satter Prize in Mathematics is awarded to Amie Wilkinson for her remarkable contributions to the field of ergodic theory of partially hyperbolic dynamical systems.

Wilkinson and Burns provided a clean and applicable solution to a longstanding problem in stability of partially hyperbolic systems in the paper: "On the ergodicity of partially hyperbolic systems" (with K. Burns, *Annals of Math.* (2) 171 (2010), no. 1, 451–489).

The study of hyperbolic systems began in the 1960s by Smale, Anosov, and Sinai; this work was built upon earlier achievements of Morse, Hedlund, and Hopf. The recent papers of Wilkinson, joint with Burns, give what is considered by experts to be the optimal result that unifies much of the deep work done by mathematicians during the intervening decades to weaken the strong hypothesis of hyperbolicity in order to be widely applicable, while retaining the fundamentals of the associated dynamical behavior.

Wilkinson has played a central role in the recent major developments in many related areas as well, including making some fundamental advances in understanding generic behavior of C1 diffeomorphisms. In addition to the outstanding work with Burns, Wilkinson works with many co-authors such as Avila, Bonatti, Crovisier, Masur, and Viana with whom she has published many significant results. A problem on the centralizers of diffeomorphisms was stated by Smale more than forty years ago and is included in his list of problems for the 21st century; the solution in the C^1 case was provided by Wilkinson in a series of papers with Bonatti and Crovisier.

Biographical Note

Amie Wilkinson grew up in Evanston, Illinois, received her A.B. from Harvard in 1989 and Ph.D. from Berkeley in 1995 under the direction of Charles Pugh. After serving one year as a Benjamin Peirce Instructor at Harvard, she moved to Northwestern in 1996 where she was promoted to full professor in 2005. She was the recipient of an NSF Postdoctoral Fellowship and has given AMS Invited Addresses in Salt Lake City (2002), Rio de Janeiro (2007) and at the 2010 Joint Meetings in San Francisco. She was also an invited speaker in the Dynamical Systems session at the 2010 ICM in Hyderabad. She lives in Chicago with her husband Benson Farb and their two children.

Response from Amie Wilkinson

This is an unexpected honor for which I am very grateful. As a woman in math, I have certainly faced some challenges: shaking the sense of being an outsider, coping with occasional sexism, and balancing career and family. These difficulties were ameliorated by the support and encouragement of numerous individuals and institutions, beginning with my parents, who thought it delightful that their older daughter loved math and science (and art and cooking). Early guidance from math teachers, especially John Benson at Evanston High School, was invaluable. The people in the Math Department at Northwestern University demonstrated their faith in me early on and never wavered

in their support. Northwestern protected my research time early on, was flexible in assigning duties later, and promoted me in a timely fashion. Some of this was a gamble on Northwestern's part, one that other departments might still be hesitant to make.

I have been educated over the years by a string of amazing mentors and collaborators, including those mentioned in the citation. Charles Pugh, Mike Shub, Keith Burns and Christian Bonatti have played a special role; together, they have taught me how to think, dream, and write mathematics. From early on, Lai-Sang Young (the 1993 Satter Prize winner) has been a role model; her work in dynamics and clarity of exposition have always set the standard. The joint project with Keith Burns mentioned in the citation was an immensely satisfying collaboration. Whenever I think that the intricacies of partially hyperbolic dynamics have been largely revealed, a new phenomenon arises to delight and inspire.

I also thank my husband Benson, my best friend, mathematical companion, and muse (who occasionally lets me be his muse as well), and my children Beatrice and Felix, who have forced me to take a break from mathematics when I needed it the most.

Morgan Prize

The Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student recognizes and encourages outstanding mathematical research by undergraduate students. It was endowed by Mrs. Frank Morgan of Allentown, Pennsylvania.

Citation for Maria Monks

Maria Monks is the winner of the 2011 Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student. The award is based on her impressive work in combinatorics and number theory, which has appeared in *Advances in Applied Mathematic,, Proceedings of the AMS*, *Electronic Journal of Combinatorics, Discrete Mathematics*, and *Journal of Combinatorial Theory, Series A.*

One of her recommenders wrote, "Although Maria has just finished her bachelor's degree, her accomplishments are what you might expect from someone in the second year of a postdoctoral position." Another wrote that her work "reveals a broad knowledge of relevant methods as well as startling insight, and it is in the mainstream of a really 'hot' area."

Monks is a Churchill Scholar, Goldwater Scholar, Hertz Fellow, and an NSF Graduate Research Fellowship recipient. She received the Alice T. Schafer Prize for Women in Mathematics in 2009 and a Morgan Prize Honorable Mention in 2010. She is also an NCAA All-American cross-country runner. She graduated from MIT in 2010.

Biographical Note

Maria Monks grew up in Hazleton, Pennsylvania, with her parents and two brothers. Her interest in mathematics began in elementary school, when her father, Ken Monks, began to home-school her in mathematics. In middle school and high school, she became involved in mathematical problem-solving through her MATHCOUNTS team, the Lehigh Valley ARML team, and the Math Olympiad Summer Program. She also began mathematical research as a high school student, writing a paper on the $3x+1$ conjecture and co-authoring another on a conjecture of Erdös and Straus.

As an undergraduate, Maria participated in the Duluth mathematics REU under the direction of Joe Gallian, and she worked with Richard Stanley and Mia Minnes at MIT, writing a total of five more research papers over the course of her undergraduate career. She also discovered her passion for teaching in college; she was a coach of the 2008 USA team for the Girls' Math Olympiad in China and became involved in local educational programs, such as Girls' Angle and Idea Math. She is a dedicated distance runner, earning All-American honors at the NCAA Cross-Country National Championships during her last year as a varsity athlete at MIT.

Maria is currently in a one-year masters' program in mathematics at University of Cambridge. She will pursue a Ph.D. at the University of California, Berkeley in the fall, where she plans to study combinatorics.

Response from Maria Monks

I am very honored to have been named the winner of the 2011 Frank and Brennie Morgan Prize, and I thank the AMS, MAA, and SIAM Morgan Prize Committee for selecting me for this award.

I would like to thank the people who have had the most impact on my mathematical education thus far. I thank Joe Gallian for nominating me for this prize and for serving as a wonderful advisor at the Duluth REU. I also express my gratitude to Ken Ono, Richard Stanley, and Mia Minnes for their help, advice, and mentorship in various research projects. Finally, I thank my father, Ken Monks, and the rest of my family for providing a wonderful environment in which to grow up and for fostering my interest in mathematics.

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JPBM Communications Award

This award was established by the Joint Policy Board for Mathematics (JPBM) in 1988 to reward and encourage communicators who, on a sustained basis, bring mathematical ideas and information to nonmathematical audiences. Both mathematicians and nonmathematicians are eligible. Currently, the award is made annually. JPBM represents the American Mathematical Society, the American Statistical Association, the Mathematical Association of America, and the Society for Industrial and Applied Mathematics.

Citation for Nicolas Falacci and Cheryl Heuton

The 2011 JPBM Communications Award is awarded to Nicolas Falacci and Cheryl Heuton for their positive portrayal of the power and fun of mathematics through their hit TV series, *Numb3rs.*

Nicolas Falacci and Cheryl Heuton created the extraordinary TV series *Numb3rs,* featuring an FBI agent and his brother, a mathematical genius. Through its six-season run on CBS, the series featured the use of mathematical thinking and modeling to solve crimes. *Numb3rs* provided the general public with a glimpse of the mathematical world, its depth and its power, in a way that connected with a broad spectrum of viewers. With creativity and cleverness, their work, which includes over 100 episodes, made its fans aware of the ubiquity of mathematics in their daily lives.

[Falacci and Heuton have been recognized by the National Science Board with its Public Service Award, and they are the recipients of the Carl Sagan Public Understanding of Science Award.]

Biographical Notes

Nicolas Falacci was born 1959 in Hyannis, Massachusetts. He attended the undergraduate film program at New York University's Tisch School of the Arts and received his B.F.A. in 1981. He sold his first feature length screenplay in 1989 to Columbia Pictures and producer Joel Silver. He continued writing film projects for various studios and producers, mostly in the science fiction genre.

That same year, while pursuing his favorite pastime of rock climbing in the Los Angeles area, he met Cheryl Heuton. Within a couple years, the two of them moved to New York City, married, and began writing together.

Cheryl Heuton was born 1957 in Whittier, California. She grew up in the north San Diego area and attended the University of California, San Diego. She worked as a reporter for local weekly newspapers, then went on to become an editorial writer for the *Los Angeles Herald-Examiner* and later the *Long Beach Press Telegram.* She was nominated for a Pulitzer Prize for her series of articles about the mentally ill homeless.

As a writing team, Cheryl and Nick sold their first feature script to Warner Brothers, then went on to write film projects for New Line, MGM, Imagine, Sony, and HBO.

In 2003, they pitched CBS Television an idea for a television series centered around a mathematician. Production on *Numb3rs* began in 2004 and the show debuted on CBS in January 2005. A ratings success, *Numb3rs* was renewed for a total of six seasons. During those six years, Cheryl and Nick worked on the show as executive producers. Each season they wrote and supervised numerous episodes.

In early 2010, Nick directed the 119th and final episode of *Numb3rs.* The show continues to be broadcast in syndication in the U.S. and in numerous foreign countries, including the United Kingdom, Germany, Sweden, Australia, Japan, and Brazil.

Response from Nick Falacci and Cheryl Heuton

While we pursued a career in film and television writing, we both have a life-long passion and interest in science. I, specifically, arrived at NYU intent on achieving a double major in film and … physics. Once I was informed of the required work load, especially the number of math classes I would have to take, I abandoned my scientific aspirations on the spot and focused my energy on filmmaking.

Cheryl and I discovered our shared love of science on our first date, when we realized we were both tremendous fans of James Burke's *The Day the Universe Changed.* Though we never discussed a specific intention to write about scientists, we found ourselves naturally inclined to create characters with backgrounds in engineering, math, and science. One of our feature scripts was based on the true story of the Glomar Explorer, an amazing engineering feat by the Navy to salvage a Russian submarine three miles beneath the surface of the ocean. We developed a network television series about the extraordinary crash and accident analysts at the National Transportation Safety Board.

It was probably only a matter of time before Cheryl and I would be drawn to the world of mathematics and mathematicians. Both long-time skeptics, we were fascinated by the rigorous rational thinking of mathematicians. We were continually and delightedly surprised by the seemingly endless capacity of mathematics to help mankind understand the nature of the world and fuel the development of technology. With the help of the writing of various

authors like John Allen Paulos, we discovered the unique way that mathematicians view the world. The more we explored and researched the topic, the more we were convinced that television audiences would find mathematicians as fascinating as we did.

Noting the popularity of crime dramas, specifically the ones based on forensic sciences, we felt that this type of storytelling could provide the opportunity to contrast and collide the thinking that goes on within a criminal investigation by police detectives with the extreme deductive reasoning of a mathematician. Our research led us to the real life collision of math and police work: Kim Rossmo, a Canadian mathematician, homicide detective and more importantly, one of the pioneers of geographic profiling.

The notion of a mathematician solving major crime investigations was a reality. We had a strong suspicion that a lot of other people would be as fascinated by this unexpected yet exciting confluence of disciplines as we were.

We are extremely honored to have been selected to receive the JPBM Communications Award. Neither of us, obviously, are mathematicians and neither of us pursued our careers with any plan to popularize mathematics on network television. So much of what brought *Numb3rs* to fruition was, as mathematicians or cosmologists might say, a happy coincidence.

By creating *Numb3rs,* we have experienced two extremely rewarding accomplishments: the excitement of creating a successful television drama and the profound satisfaction of introducing an audience of 10 to 12 million viewers each week to the elegance and power of mathematics and its direct impact on our daily lives.

We wish to acknowledge our utmost gratitude and appreciation for the people at CBS who believed in the show from the very beginning; the other *Numb3rs* writers who took on the daunting task of incorporating mathematics into a crime procedural drama week in, week out; our entire production staff who embraced the notion and premise of the show; our enthusiastic researchers, and our extraordinarily talented consultants who helped us navigate the world of mathematics; and, of course, Caltech, for its vigorous and wholehearted support of the show and for making us welcome on their campus.

Certificates of Meritorious Service

The Certificate of Meritorious Service is presented for service at the national level or for service to a Section of the MAA. The first such awards were made in 1984. At each January meeting of the Association, honorees from several Sections are recognized.

Citation for Jenny McNulty, Pacific Northwest Section

Jenny McNulty has served the Pacific Northwest Section in a variety of important ways; most notably she was the founder of the Pacific Northwest Section (PNW) Project NExT during her time as Section chair from 1999 to 2001. Jenny has been the Section NExT director since its founding and has coordinated their programs at the Section meetings and managed the PNWNExT listserve. Jenny was the force behind the PNW Section having its own Project NExT before most other Sections. The program continues to flourish and is a major reason that the Section has renewed vitality; revival of the Section can be marked with the April 2001 meeting, planned under Jenny's tenure as Section chair. As evidence of Jenny's continued impact on the Section, during the banquet at the 2010 Section meeting, attendees were asked to raise their hands if they were involved with Project NExT activities, and half the people in the room raised their hands. Jenny McNulty is the reason for all those hands.

The Mathematical Association of America is proud to award Professor Jenny McNulty with a Certificate for Meritorious Service.

Biographical Note

Jenny McNulty is a professor at the University of Montana, located in the beautiful mountains of western Montana. She received a B.A. from Providence College, an M.A. from Stony Brook University and a Ph.D. from the University of North Carolina. Her love of mathematics was cultivated at an early age. She remembers making calendars in grade school in which the dates were expressed in a different base each month; the class favorite was base 11 and least favorite base 2. Jenny works in the area of matroid theory and directs research of both undergraduate and graduate students in this field. Her favorite part of academics is its changing nature. When not working, Jenny can be found playing ice hockey or exploring the outdoors with her two sons.

Response from Jenny McNulty

I am delighted and honored to be receiving this Certificate for Meritorious Service. Being involved with the Pacific Northwest Section, especially with the Section NExT, has been a fun and rewarding experience. It is hard to believe that the PNW Section NExT will hold its twelfth meeting this year and that the program has grown to such an extent.

My involvement with the PNW Section has provided me with the opportunity to meet and work with many

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talented, accomplished, and dedicated people. Our Section and its members are a bit unique. This uniqueness is seen in members' willingness to try new things, be it having our meeting in Alaska or trying new techniques in the classroom. I am thankful for the opportunity to work with such inspiring people. Thank you!

Leroy P. Steele Prize for Seminal Contribution to Research

The Leroy P. Steele Prizes were established in 1970 in honor of George David Birkhoff, William Fogg Osgood, and William Caspar Graustein and are endowed under the terms of a bequest from Leroy P. Steele. Prizes are awarded in up to three categories and each is awarded annually. The following citation describes the award for Seminal Contribution to Research.

Citation for Ingrid Daubechies

The Steele Prize for Seminal Contribution to Research is awarded to Ingrid Daubechies for her paper "Orthonormal bases of compactly supported wavelets" (*Comm. Pure Appl. Math. 41* (1988), no. 7, 909–996). In this paper Daubechies constructs the very first examples of families of wavelets (rescalings of a single "mother wavelet") that are simultaneously smooth, orthonormal, and compactly supported; earlier examples of wavelets had two out of three of these properties, but not all three at once. The orthonormality makes them good as a basis to decompose arbitrary signals; the smoothness removes edge artifacts and makes wavelet series converge rapidly; and the compact support makes them viable for use in actual practical applications. The wavelets also came with a parameter that traded off their smoothness for the width of their support and amount of oscillation, making them flexible enough to be used in a variety of situations. As such, these wavelets (now known as *Daubechies wavelets*) became extremely popular in practical signal processing (for instance, they are used in the JPEG 2000 image compression scheme). Even nowadays, they are still the default, general-purpose wavelet family of choice to implement in any signal processing algorithm (although for specialized applications, sometimes a more tailored wavelet can be slightly superior).

At the time of this paper, wavelet theory was already a booming field, with hundreds of papers devoted to wavelet construction, efficient algorithms, etc. At present the field is more mature and settled, an effect to which Daubechies' paper significantly contributed, by largely "solving" the problem of the best wavelets to use in general (and also by giving order to the chaotic explosion of literature).

In his MathSciNet ® review of the paper, Hans Feichtinger wrote, "Even before its publication, the paper had a remarkable impact within applied analysis, and great interest in wavelet theory has been shown from many sides. By the summer of 1989 there was already a software package available, running on PCs, which is based on the construction described in this note. This sheds some light on the speed with which new mathematical algorithms are brought to work these days and can serve to underline the importance of mathematical research to applied fields."

Biographical Note

Ingrid Daubechies received both her Bachelor's and Ph.D. degrees (in 1975 and 1980) from the Free University in Brussels, Belgium. She held a research position at the Free University until 1987. From 1987 to 1994 she was a member of the technical staff at AT&T Bell Laboratories, during which time she took leaves to spend six months (in 1990) at the University of Michigan and two years (1991–93) at Rutgers University. She is now at the Mathematics Department and the Program in Applied and Computational Mathematics at Princeton University. Her research interests focus on the mathematical aspects of time-frequency analysis, in particular wavelets, as well as applications. In 1998 she was elected to be a member of the National Academy of Sciences and a Fellow of the Institute of Electrical and Electronics Engineers. The American Mathematical Society awarded her a Leroy P. Steele Prize for Mathematical Exposition in 1994 for her book *Ten Lectures on Wavelets,* as well as the 1997 Ruth Lyttle Satter Prize. From 1992 to 1997 she was a Fellow of the John D. and Catherine T. MacArthur Foundation. She is a member of the American Academy of Arts and Sciences, the American Mathematical Society, the Mathematical Association of America, the Society for Industrial and Applied Mathematics, and the Institute of Electrical and Electronics Engineers. In addition, Dr. Daubechies was elected in 2010 to serve as the next president of the International Mathematical Union.

Response

I am delighted and very grateful to receive this award, especially for this paper. In my work, I try to distill, from extensive contacts with scientists and engineers, challenging mathematical problems that nevertheless are still connected to the original question. When I am lucky, as was the case

for this paper, the answer to the question or the results of the study are not only interesting mathematically but also translate into something new and useful for the application domain. I also would like to thank *Communications in Pure and Applied Mathematics,* where the paper appeared, for accepting to include those long tables of coefficients—its impact in engineering would not have been the same without the tables, at that time a standard feature of papers on filter constructions in signal analysis.

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Association for Women in Mathematics Executive Director

The Association for Women in Mathematics (AWM) 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 to study and have careers in mathematics, and to build community among all mathematical scientists. AWM currently has more than 3000 members (women and men) representing a broad spectrum of the mathematical community—from the United States and around the world. AWM is one of 17 member societies of the Conference Board of the Mathematical Sciences.

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This position requires an advanced degree in any field of mathematics, preferably a Ph.D. The Executive Director will be expected to supervise volunteers, programs, and activities, to work with volunteers in preparing grant proposals and grant reports, to assist with fundraising efforts and membership drives, to represent the AWM at some major mathematics conferences, and to prepare press releases and announcements. The Executive Director will work closely with the AWM President, Executive Committee, and staff.

This is a part-time position for a (renewable) term of two years that may be combined with an existing academic appointment. The term begins on January 1, 2012 (but a paid training period could begin in early fall 2011). The AWM office is in Fairfax, VA, but the geographic location of the Executive Director is flexible. Ultimately, we seek an accomplished individual who is passionate about supporting women in mathematics.

Review of applications will begin on May 1, 2011 and will continue until the position is filled. Applicants are asked to describe why they feel well suited to this position and how this position could best fit with their existing plans. A letter of application, a curriculum vitae/resumé describing employment history, and contact information for at least three people willing to be called upon to provide a reference should be sent as a single PDF file to Jill_Pipher@Brown.edu.

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

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Individuals wishing to be considered for this position should send a copy of their CV and a letter of interest to:

Dr. Jay R. Walton, Chair
IUMRI Mathematics Search Committee
Department of Mathematics
3368 TAMU
Texas A&M University
College Station TX 77843-3368

Electronic submissions will also be accepted and should be sent to: jwalton@math.tamu.edu, with IUMRI Mathematics Position in the Subject Line. Additional information and letters of reference will be solicited after a preliminary review. Review of the applicant pool will begin April 1, 2011. Start dates are flexible, and the position will remain open until filled. Texas A&M University is an Equal Opportunity Employer and has a policy of being responsive to the needs of dual-career couples.

The Institute for Computational and Experimental Research in Mathematics

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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.net, (703)934-0163, or visit our website at: http://www.awm-math.org.

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