AWM
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

Greetings from 35,000 feet, en route from the Joint Mathematics Meetings (JMM) in San Diego to my home in Boston. As I begin my term as President of AWM, I would like to take this opportunity to look back over the accomplishments of the past two years and forward to my vision for the next two.

Looking back. We all owe Jill Pipher an enormous "thanks" for the outstanding leadership she has provided AWM for the past two years. It is mind-boggling to realize that she simultaneously served as the President of AWM, the Director of a new institute (ICERM), and the mother of a teenager!

Under Jill's leadership, AWM undertook several new initiatives. In 2011, AWM celebrated its 40th anniversary with a major research conference, "40 Years and Counting: AWM's Celebration of Women in Mathematics." The event attracted over 320 participants, women and men, from about 150 different institutions. The conference was an inspiring testament to how far we have come as a community. This led to the idea of organizing a series of biennial AWM Research Symposia. The first of these symposia will take place this spring, on March 16–17, at Santa Clara University. Modeled on the 40th Anniversary conference, it will include plenary talks by Inez Fung, Maryam Mirzakhani, and Lauren Williams, special sessions on a wide variety of topics, a poster session and a contributed paper session. In addition, there will be a panel on the "imposter syndrome" that promises to spark a lively discussion.

For the past 20 years, AWM has held an annual workshop at the JMM for graduate students and postdocs to present their work and meet with more senior mentors. In the past, the workshop presentations spanned a broad spectrum of mathematics and attendance consisted mainly of other workshop participants. Realizing a new vision for these workshops, this year's event focused primarily on a single topic, number theory. Participants had a chance to share their work and network with others in their field. The talks attracted many JMM participants not directly connected to the workshop. The results were impressive; the level of interest and interaction was noticeably higher than in prior years.

Also under Jill's leadership, AWM initiated a new series of research prizes. These prizes are designed to highlight the accomplishments of outstanding women mathematicians early in their career when awards can have a significant impact on career trajectories. The goal is to institute four such prizes, organized by field, with each prize awarded every two years. The first two of these prizes have been funded, and the inaugural awards will be presented at JMM 2014. The AWM-Sadosky Research Prize in Analysis is named for Cora Sadosky (1940–2010), a former

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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. Authors sign consent to publish forms.

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President's Report *continued from page 1*

president of AWM, and is made possible by generous contributions from Cora's family and friends. The AWM-Microsoft Research Prize in Algebra and Number Theory is made possible by a generous contribution from Microsoft Research through the efforts of Kristin Lauter, head of the Cryptography Research Group at Microsoft Research. An article about these prizes appears in the January 2013 issue of the AMS *Notices*.

Last but not least, Jill oversaw some structural changes inside the organization to make it function more smoothly and effectively. In addition, when Executive Director Maeve McCarthy decided to return to full-time teaching and research, Jill found AWM a new Executive Director, Magnhild Lien, from Cal State Northridge, whose vision, good sense, and organizational skills have already contributed much to the success of our programs.

Of course, Jill could not have done all of this on her own. AWM also owes tremendous thanks to the many devoted and enthusiastic volunteers who make the organization a vital and productive force in the mathematics community. Particular appreciation is due to Georgia Benkart, a former president of AWM, who has remained fully involved and contributed greatly over the past two years.

Looking forward. Building on the successes of the past few years, AWM has several new initiatives in progress or in planning. Taken together with our numerous ongoing programs, there is much to look forward to and much work to be done.

In addition to the biennial Research Symposia described above, plans are taking shape to organize a series of focused workshops aimed at promoting collaborative research and forming sustainable networks within a field. These workshops will include one-day JMM Workshops and week-long Collaboration Workshops. The JMM Workshops will be modeled on this year's highly successful JMM Workshop, with a different topic chosen each year. The Collaboration Workshops will be modeled on the WIN (Women in Numbers) and ACxx (Algebraic Combinatorixx) workshops held at the Banff International Research Station. As mathematics becomes an increasingly collaborative endeavor, the connections generated by such workshops could play an important role in advancing participants' careers.

Looking beyond our traditional base, AWM is seeking to build connections with our colleagues in industry. The goal is to increase lines of communication with mathematicians in industry and to develop programs that could benefit both our members and the industries involved, programs that help open doors for women interested in working in industry and that help companies attract more mathematically talented women.

Finally, a perennial challenge for AWM is to find funding both for ongoing programs and for realizing new initiatives. We hope that through stronger connections with industry and through the generosity of our members, we can build a more substantial funding base. We also seek funding for two additional early-career prizes, one in topology and geometry, and the other in applied mathematics. We especially count on those of you who have benefitted from AWM programs in the past to help insure that others can benefit similarly in the future.

The Joint Mathematics Meetings. The vitality of AWM was on full display at the Joint Mathematics Meetings in San Diego this year. Wednesday led off with a meeting of the Executive Committee. For myself, participating in face-to-face discussions rather than a phone conference was a treat. The meeting

was enriched by the presence of past AWM presidents Linda Rothschild, Linda Keen, Carol Wood, Sylvia Wiegand, Barbara Keyfitz, Cathy Kessel, and Georgia Benkart, whose insights and support are greatly appreciated.

Later that afternoon came the AWM panel discussion on "The Retention of Women in Mathematics," organized by Ami Radunskaya and Christina Sormani and moderated by Cheryl Geisler. The topic was chosen in response to an article in *Science* entitled "Survival Analysis of Faculty Retention in Science and Engineering by Gender," in which it was reported that the survival rate for women assistant professors in mathematics is only 4.45 years. The panelists, Andrea Bertozzi, Estela Gavosto, Douglas Haynes, Marianne Korten, and Lisette de Pillis, discussed various techniques used successfully at their institutions to attract and support women in the early stages of their careers. At one point, Andrea asked how many people in the audience were department chairs, and it was heartening to see many hands go up. Follow-up questions and suggestions are invited at https://sites.google.com/site/awmpanel2013/.

The panel was followed by a brief business meeting that included the symbolic passing of the silver bowl from the outgoing president to the (smiling, but slightly apprehensive) incoming president. Wednesday's activities concluded with the AWM reception. This was a lively and well-attended event. It began with refreshments and a networking activity based on the card game SET. Jill addressed the gathering and introduced this year's Schafer Prize winners as well as the winners of a new award for exceptional service to AWM. The evening concluded with a not-to-be-missed musical performance of "This Math is Your Math" (to the tune of "This Land Is Your Land") led by Ami Radunskya and Kristen Lauter.

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The passing of the silver bowl: Ruth Charney and Jill Pipher

Membership Dues
Membership runs from Oct. 1 to Sept. 30
Individual: $65 **Family:** $30
Contributing: $150
New member, affiliate and reciprocal members, retired, part-time: $30
Student, unemployed: $20
Outreach: $10
AWM is a 501(c)(3) organization.

Institutional Membership Levels

Category 1: $325
Category 2: $325
Category 3: $200
Category 4: $175

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
γ **Circle:** $1000–$2499

See the AWM website for details.

Subscriptions and Back Orders—All 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 $65/year ($75 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 $116 for a basic four-line ad. Additional lines are $14 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.

The Alice T. Schafer Prize recognizes undergraduate women who have demonstrated excellence in mathematics. Former winners have gone on to top graduate programs and tenure-track jobs in mathematics. Last year's winner, Fan Wei, won this year's Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student. This year's winner was MurphyKate Montee, a senior at the University of Notre Dame, with runner-up, Yuhou (Susan) Xia, a senior at Bryn Mawr College. Honorable mentions went to Thao Do, Stony Brook University; Rebecca Gleit, University of Michigan; and Yangzhou Hu, MIT. Congratulations to all five! Details about the Schafer prize winners appear in an article later in this newsletter.

AWM relies heavily on individuals who volunteer their time and energy in the interest of promoting and supporting women in mathematics. The new AWM Service Awards are designed to recognize those who have performed exceptional service for AWM in recent years. In this first year of the prize, there were so many past and present volunteers we wished to thank that we opted to name 10 awardees: Margaret Bayer, Holly Gaff, Rebecca Goldin, Rebecca Herb, Victoria Howle, Pao-sheng Hsu, Krystyna Kuperberg, Rachel Kuske, Shari Moskow, and Erica Voolich. Their service has been invaluable to the organization.

Thursday morning the Thirty-Fourth Annual Noether Lecture was presented by Raman Parimala, the Arts and Sciences Distinguished Professor of Mathematics at Emory University. Parimala is widely known for her for fundamental work in algebra and algebraic geometry. She is a Fellow of three science academies and has won numerous awards for her research, including the Srinavasa Ramanujan Medal of the Indian National Science Academy. Her Noether lecture, "A Hasse principle for quadratic forms over function fields," was a real treat. She did an exceptional job of making the subject interesting and comprehensible, even for those of us totally outside the field. Thank you Parimala!

The Joint Prize Session took place later that day. AWM presented three prizes at this year's session, including the official presentation of the Alice T. Schafer Prize to MurphyKate Montee. The Louise Hay Award for Contributions to Mathematics Education was awarded to Amy Cohen. Amy has an impressive record of contributions to math education as a teacher, a scholar, and an administrator over her 40-year career at Rutgers University. She is currently a principal investigator for the NSF-funded New Jersey Partnership for Excellence in Middle School Mathematics. She has served as Dean of Rutgers' University College, co-PI for her department's VIGRE grant, and liaison to the Rutgers School of Education. She has provided extensive service to various professional organizations, including AWM where she served as treasurer, member of the Education Committee, and workshop mentor. The M. Gweneth Humphreys Award for Mentorship of Undergraduate Women in Mathematics was awarded to James Morrow of the University of Washington. Jim is lauded as an exceptional teacher who provides his students with motivation and support, fosters confidence and encourages their interest in mathematics. He has an outstanding record of motivating women to pursue advanced degrees and research careers in the field. For the past 24 years, the UW math department has run a model REU program co-founded by Jim. Nearly 30 women participants of this REU have gone on to do graduate work in the mathematical sciences, often at top-tier universities.

ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM ONLINE

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

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

AWM DEADLINES

AWM Travel Grants:
May 1 and October 1, 2013

AWM Louise Hay Award:
April 30, 2013

AWM M. Gweneth Humphreys Award:
April 30, 2013

AWM Workshop at JMM 2014:
August 15, 2013

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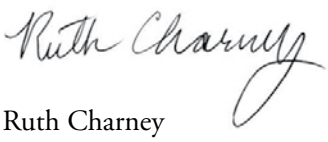
Friday afternoon included a special AMS presentation, "A conversation on nonacademic employment," consisting of a panel of mathematicians working in industry. The panelists painted an enticing picture of opportunities for PhD mathematicians in industry. I took the opportunity to make some valuable connections with industry representatives.

Friday evening and all day Saturday were devoted to the AWM Workshop on Number Theory, organized by Kristin Lauter and Bianca Viray, with the help of Kathryn Leonard. The workshop began with a well-attended reception and poster session Friday evening. Saturday's activities included two sessions of talks and a luncheon. As noted above, the event was highly successful. An article about the workshop appears later in this newsletter. We would like to thank MAA and AMS for their cooperation in arranging the new workshop format for this and future Joint Meetings.

Altogether, it was a busy week and an excellent start on the new year.



Ruth Charney
Waltham, MA
January 24, 2013

Ruth Charney

Call for Suggestions

In December 2013 we will be electing the following officers: President-Elect, Clerk and four At-Large Members. Suggestions for candidates may be made to Ruth Charney by **April 1, 2013**; she will pass them along to the Nominating Committee. Your input will be appreciated!
Georgia Benkart,
recent AWM president,
will serve as chair
of the Nominating
Committee.

ASSOCIATION FOR WOMEN IN MATHEMATICS

Letter to the Editor

Jessica Hale's article in the January–February 2013 newsletter discusses recent events involving one mathematics education researcher and two mathematicians. I've put an analysis of the related intellectual issues at my blog: http://mathedck.wordpress.com.

What I want to mention here is the tendency to frame these events in terms of two communities—mathematicians and mathematics education researchers—rather than three people. In my opinion, this framing obscures the tremendous change that has occurred within the mathematics community with respect to education and education research.

The recent death of Phil Wagreich is a sad reminder that we didn't always have sessions on mathematics education at the Joint Mathematics Meetings. An annual series of sessions began in 1990, initiated by Mathematicians and Educational Reform, which was founded by Wagreich, Harvey Keynes, and Naomi Fisher (see "What is MER?" in the January–February 1996 AWM *Newsletter*). The MER sessions at the Joint Meetings included (and continue to include) talks by mathematics education researchers.

The MER sessions are now accompanied by other sessions on mathematics education, including Research in Undergraduate Mathematics Education (RUME), an activity of the MAA special interest group on RUME. And that's just a part of the expansion of mathematicians' collective support for mathematics education research.

The AWM's Hay Award goes to mathematics educators as well as mathematicians.

The AMS collects and reports annual statistics on recent PhDs in mathematics education along with those in mathematics. (If the American Educational Research Association does anything similar, it seems to be a well-guarded secret.) The AMS *Notices* frequently publishes articles on doctorates in mathematics education. The most recent (February 2012) of these is about a program designed to support early-career faculty members that drew on the expertise and experience of a similar program for mathematicians.

The American Statistical Association has published the report *Using Statistics Effectively in Mathematics Education Research* (2007), written by a group of education researchers and statisticians.

The Conference Board of the Mathematical Sciences has published *U.S. Doctorates in Mathematics Education: Developing Stewards of the Discipline* (2008) and *One*

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LETTER TO THE EDITOR *continued from page 5*

Field: Many Paths: U.S. Doctoral Programs in Mathematics Education (2001) as well as the book series Research in Collegiate Mathematics Education.

The Mathematical Sciences Research Institute hosts an annual workshop on Critical Issues in Mathematics Education, organized by mathematicians and mathematics educators. The tenth in this series is "Assessment of Mathematical Proficiencies in the Age of the Common Core," April 3–5, 2013.

This workshop is but one of many efforts that reflects an especially important outcome of collaboration among mathematicians, statisticians, mathematics education researchers, and others: the Common Core State Standards for Mathematics. Many engaged in efforts to achieving the goals set by the Common Core understand that an essential part of this effort is collaboration and that a necessary part of productive collaboration is respect for each collaborator's community. Individuals may disagree and engage in acrimonious actions, but as communities, mathematicians and mathematics education researchers have passed the stage of dismissing each other's expertise.

Cathy Kessel
Berkeley, CA

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 grants 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**.

AWM at the San Diego JMM

AWM NOETHER LECTURE

The 2013 Noether Lecture, "A Hasse principle for quadratic forms over function fields," was delivered by Raman Parimala, Emory University. She was introduced by Jill Pipher, Brown University.

Abstract: The term "Hasse principle" stands for the idea of finding integer solutions to equations by piecing together solutions modulo different prime powers. Solutions modulo prime powers lead to solutions in the completions of the field of rational numbers at p-adic valuations. A classical theorem of Hasse-Minkowski states that a quadratic form over rational numbers admits a nontrivial solution if it does over all p-adic completions and is indefinite over real numbers. There are more general theorems on the obstructions to the Hasse principle for the existence of rational points on homogeneous spaces under linear algebraic groups defined over number fields. We shall discuss formulations of the Hasse principle over function fields and some consequences for quadratic forms.

Presentation of Noether Lecture plaque: Jill Pipher and Raman Parimala

Citation for Raman Parimala

Raman Parimala is the Arts and Sciences Distinguished Professor of Mathematics at Emory University and was selected as the 2013 Noether Lecturer for her fundamental work in algebra and algebraic geometry with significant contributions to the study of quadratic forms, hermitian forms, linear algebraic groups and Galois cohomology.

Parimala received her PhD from the University of Mumbai (1976). She was a professor at the Tata Institute of Fundamental Research in Mumbai for many years before moving in 2005 to Emory University in Atlanta, Georgia. She has also held visiting positions at the Swiss Federal Institute of Technology (ETH) in Zürich, the University of Lausanne, University of California-Berkeley, University of Chicago, Ohio State University, and the University of Paris at Orsay.

In the seventies, Parimala's examples of nontrivial quadratic spaces over an affine plane came as a surprise to experts, in contrast to the affirmative solution of Serre's question on triviality of algebraic vector bundles over an affine space by Quillen and Suslin. Parimala is perhaps best known for proving Serre's Conjecture II for classical groups. This well-known conjecture on the Galois cohomology of linear algebraic groups was formulated in the early 1960s. The problem is of continued interest and has yet to be solved for many exceptional groups. Another of her significant contributions to the theory of quadratic forms can be found in a 2010 paper, where she proved that the u-invariant of a function field of a non-dyadic p-adic curve is exactly 8, settling a conjecture made nearly 30 years earlier.

Parimala has won many awards in recognition of her accomplishments. She gave a plenary address at the 2010 International Congress of Mathematicians (ICM) in Hyderabad and a sectional address at the 1994 ICM in Zurich. By 1992 she was a Fellow of the Indian Academy of Sciences, the Indian National Science Academy and the National Academy of Sciences India.

In 2005, she was awarded the prize in mathematics by the Academy of Sciences for the Developing World, making her the first woman to receive that honor. Parimala has also received the Srinavasa Ramanujan Medal of the Indian National Science Academy in 2006, an honorary doctorate from the University of Lausanne in 1999, and the Bhatnagar prize in 1987.

AWM PRIZES

Louise Hay Award for Contributions to Mathematics Education

In 1990 AWM established the annual Louise Hay Award to recognize outstanding achievements and contributions in any area of mathematics education. While Louise Hay was widely recognized for her contributions to mathematical logic and for her strong leadership of her department, her devotion to students and her lifelong commitment to nurturing the talent of young women and men secured her reputation as a consummate educator. The annual presentation of this award is intended to highlight the importance

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of mathematics education and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being.

Citation for Amy Cohen

The 2013 Louise Hay Award is presented to Amy Cohen in recognition of her contributions to mathematics education throughout an outstanding 40-year career at Rutgers University. Like Louise Hay, her career is remarkable for her achievements as a teacher, scholar, administrator, and human being. An elected fellow in American Association for the Advancement of Science, Amy has won many awards including distinguished service and teaching awards from her MAA Section.

Amy Cohen

She is principal investigator (PI) for the New Jersey Partnership for Excellence in Middle School Mathematics, an NSF-funded Math and Science Partnership Program. As part of that grant, she led the development of a geometry course for teachers. Earlier curriculum work included new mathematics courses for elementary and high school teachers, the revision of her department's precalculus program, and a course, "Introductory Algebra for Returning Adults."

She has served as Dean of Rutgers' University College, co-PI for her department's VIGRE grant, and as a liaison to the School of Education, serving on many education committees.

Amy has made important contributions to mathematics education through her writing, the many talks she has given, and her service to professional organizations. For the MAA she has been a Project NExT consultant, member of the Committee on the Undergraduate Program in Mathematics, and chair of the committee to select the Leitzel Lecturer. For the AMS she was a member of the Committee on Research in Undergraduate Mathematics Education. She is on the MSRI Education Advisory Committee and was on the organizing committee for two Critical Issues in Mathematics Education workshops. For the American Institute of Mathematics, she was a co-PI and organizer for two workshops on Finding and Keeping Graduate Students in the Mathematical Sciences. For AWM, Amy has served as treasurer, member of the Education Committee, and workshop mentor.

Amy Cohen richly deserves the Louise Hay Award.

Response from Cohen

It is an honor to receive this award—and a challenge to remain worthy of it.

Expressions of sincere gratitude are due to many: (a) to AWM for supporting women in many paths through the world of mathematics; (b) to my teachers for guidance, for encouragement, and sometimes for evoking an obstinate desire to prove their nay-saying wrong; (c) to my students for both encouraging and challenging feedback; (d) to my parents who revised their feelings that math was an unsuitable job for a woman; and finally (e) to my son for thriving in the family business.

When I entered the profession, there was a broad consensus that women had to choose between teaching and research and that most should choose to teach. I am particularly grateful that the participation of women in our mathematics profession is now well-enough established that it is now okay for a female to be interested in both teaching and research.

In an essay for a CBMS volume, I once argued that research was essentially easier than teaching because a researcher had so much more control than a teacher. Researchers can choose topics that suit their interests and strengths. A theorem doesn't care whether it is proved. Teachers (including professors) can rarely influence the curriculum and the preparation of their classes, and students have all sorts of issues about being taught. There are serious intellectual questions about structuring instruction that engages learners and helps them learn math, especially those who don't find mathematics "obvious." Addressing those questions takes time and effort, but it can make teaching more satisfying for teachers as well as for learners. A recent Steele Prize winner once told me long ago, "Teaching is more fun when students learn."

M. Gweneth Humphreys Award for Mentorship of Undergraduate Women in Mathematics

The award is named for M. Gweneth Humphreys (1911–2006). Professor Humphreys graduated with honors in mathematics from the University of British Columbia in 1932, earning the prestigious Governor General's Gold Medal at graduation. After receiving her master's degree from Smith College in 1933, Humphreys earned her PhD at age 23 from the University of Chicago in 1935. She taught mathematics to women for her entire career, first at Mount St. Scholastica College, then for several years at Sophie Newcomb College, and finally for over thirty years at Randolph-Macon Woman's College. This award, funded by contributions from her former students and colleagues at Randolph-Macon Woman's College, recognizes her commitment to and her profound influence on undergraduate students of mathematics.

Jill Pipher and James Morrow

Citation for James Morrow

The Association for Women in Mathematics is pleased to present its third annual M. Gweneth Humphreys Award to Professor James Morrow of the Department of Mathematics at the University of Washington (UW).

The letters of nomination describe Jim as a superb teacher. Annually, he teaches the year-long Honors Advanced Calculus at UW in which he teaches students how to approach and enjoy problem solving. He challenges the students with tough problems, but also provides motivation and enormous support to get them to discover the solutions. He has an outstanding record of motivating women students to pursue advanced degrees and research careers in the mathematical sciences. He accomplishes this by encouraging his students, by fostering their confidence, and by understanding and anticipating their needs as they follow their interests.

A mid-career shift in Jim's research program from complex geometry to discrete inverse problems fortuitously extended his already well-established influence on undergraduate women (and men), primarily through the NSF-funded REU he co-founded in 1988 at UW. Often described by the NSF as a model program, it has attracted a stellar group of students in its 24 years of existence. Included in this group are nearly 30 women who have gone on to do graduate work in the mathematical sciences, often at top-tier universities.

In support of Jim's nomination, several women expressed sentiments conveyed in these excerpts:

> I am very grateful to Jim Morrow for the course my life has taken over the past several years. He saw potential in my application to his REU way back when I was a junior in college and I had not taken many advanced classes.... Like too many other mathematically talented women, I didn't really think about graduate school as a possibility; no one had suggested it to me.... Thanks to Jim, I did consider it, and now I am a successful student at a very good graduate school.
>
> I'm pretty sure that if it weren't for Jim, I never would have become a mathematician.
>
> Jim was the most influential professor in my undergraduate career.... His devotion to his students is unparalleled.

The AWM is proud to honor Jim Morrow's outstanding achievements in inspiring undergraduate women to discover and pursue their passion for mathematics.

Response from Morrow

My first reaction when I was notified that I had received the M. Gweneth Humphreys Award was disbelief. There are so many deserving candidates that I thought it very unlikely that I would get the award. When our Chair, Selim Tuncel, walked in to the first day of this summer's REU program and asked me if I had read my email and told me the news, I was stunned into speechlessness.

My second, and lasting, reaction is that my students are the ones who deserve the award. I am supremely lucky

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to have been able to work with such outstanding people. I feel like I am just an observer and my only contribution is to listen, encourage, and help my students realize their potential. Seeing these students do so well is my main joy in teaching. My students seem like they are my children, and my main duty is to help them make good decisions. I hope that they can be as lucky as I have been to have a rewarding life in which their work is something they deeply love.

I prefer not to single out any of them, but I'd like to quote two of them.

> If you hadn't encouraged me to apply to your REU program, I doubt I would have become a mathematician. And I love my work!

> You are one of the truly gender-blind math teachers I've ever had (including women), and that in and of itself is a blessing to your female students.

Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman

In 1990, the Executive Committee of the Association for Women in Mathematics established the annual Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman. The prize is named for Alice T. Schafer (1915–2009), one of the founders of AWM and its second president, who contributed greatly to women in mathematics throughout her career. The criteria for selection include, but are not limited to, the quality of the nominees' performance in mathematics courses and special programs, an exhibition of real interest in mathematics, the ability to do independent work, and (if applicable) performance in mathematical competitions.

AWM is pleased to present the twenty-third annual Alice T. Schafer Prize to **MurphyKate Montee**, University of Notre Dame. Additionally, the accomplishments of four other outstanding young women were recognized on Wednesday, January 9, 2013. AWM was pleased to honor **Yuhou (Susan) Xia**, Bryn Mawr College, as runner-up and **Thao Do**, Stony Brook University, **Rebecca Gleit**, University of Michigan, and **Yangzhou Hu**, Massachusetts Institute of Technology as honorable mention recipients.

Citation for MurphyKate Montee

MurphyKate Montee is a senior Honors Mathematics major at University of Notre Dame and a member of its Seminar for Undergraduate Mathematical Research. At Notre Dame,

Schafer Prize recipients: MurphyKate Montee, Yuhou (Susan) Xia, and Thao Do (absent: Rebecca Gleit and Yangzhou Hu)

Montee has consistently excelled in mathematics classes at both the undergraduate and graduate level and has received numerous merit scholarships rewarding her extraordinary ability and promise.

Montee has participated in multiple undergraduate research projects at Notre Dame and in two summer NSF-REU programs. Her time at the Louisiana State University REU led to a co-authored paper on the recursive behavior of ribbon graph polynomials. The following summer, Montee attended the SMALL program at Williams College, where she produced two papers. The first was a single-authored paper "with lots of clever geometric arguments" predicted to appear in a strong mathematics research journal. The second, "Knot Projections with a Single Multi-Crossing," is hailed by her advisor as "perhaps the best work I have ever done with students," containing results that will have a significant influence on future knot theory research.

Montee's mentors uniformly praise her motivation and "infectious" enthusiasm for the subject, calling her "one of the most mathematically mature students I have ever known" and "exceptionally gifted." Those who have worked with Montee expect that she will have many more "impressive results" and an "amazing career" ahead of her, in part because of her uncanny ability to get right at the heart of a problem.

Response from Montee

I am honored to be selected as the recipient of the Alice T. Schafer Prize. I would like to thank the AWM for offering this award to support young women in mathematics, and the selection committee in particular for choosing me. I am incredibly grateful to so many people for helping me get

here: to my family and friends for their constant support, and to the Notre Dame math department, as well as to the REUs at LSU and Williams College. Special thanks to Mr. Cliff Wind, for going above and beyond for me in high school; his obvious love of math and his brilliant teaching inspired me to pursue a career in mathematics. To Prof. Neal Stoltzfus, who mentored me in my first research experience, and who helped me find my own mathematical style. To Prof. Colin Adams, whose endless stream of interesting questions is exciting and inspirational, and whose support and encouragement means more to me than I can say. To my advisor, Prof. Frank Connolly, who has worked with me since my sophomore year to keep me challenged, and who has always pushed me beyond what I thought myself capable of.

Citation for Yuhou (Susan) Xia

Yuhou (Susan) Xia is a senior at Bryn Mawr College, but has also taken courses at Haverford College, Swarthmore College, and at the University of Pennsylvania. She has won scholarly awards at Bryn Mawr from both the mathematics department and the college. Her recommendation letters call her a "tenacious problem solver" and rave about her exceptional mathematical writing. She is repeatedly lauded for her mathematical maturity, evidenced both by her understanding of deep topics and her clear expositions.

Xia has completed graduate-level coursework at the University of Pennsylvania and is currently pursuing an independent study there for her honor's thesis. Her work in the graduate courses has been "as good as those of the best PhD students in the class," and she is praised for her enthusiasm and excitement for new mathematical ideas.

Xia participated in an REU at Michigan, achieving results on "longstanding and much-studied" problems related to Diophantine equations and complex polynomials. She took on the difficult case where the polynomial is reducible, building up skills from Galois theory to tackle the problem. Her contribution was "at the level of a world-class professional mathematician." The results from her group were termed "major breakthroughs" which will result in articles submitted to high-level research journals.

Response from Xia

I am deeply honored to be the runner-up of the 2013 Alice T. Schafer Prize. I would like to thank AWM for offering this prize and for its continuous support for women in mathematics. There are many people who helped me along the way during my pursuit of mathematics and I am grateful for them all. I would like to thank three people in particular. I want to thank Professor Mike Zieve, my advisor at the University of Michigan REU, for his meticulous hands-on guidance during the program. He is extremely prolific and efficient as a research mathematician and shows great care for his students. I am also very appreciative of my major advisor, Professor Josh Sabloff, who has always been supportive of my goals and encouraged me through some tough times. Finally, I would like to thank Professor David Harbater. He opened me to many opportunities and also gave me a lot of encouragement and valuable advice by sharing his own experience. I would not be where I am today if it were not for him.

Citation for Thao Do

Thao Do is a junior at Stony Brook University, where in her fifth semester she has already mastered the undergraduate curriculum and is enrolled in several graduate level courses. As a high school student, she medaled in the International Mathematical Olympiad; at Stony Brook, she has received "impressive" scores on the Putnam exam and in her freshman year earned the top individual score on the Garden State Undergraduate Mathematics Competition. Do's nomination packet was filled with superlatives from her letter writers—describing her as "the strongest undergraduate I have come across in some forty years," "one of the engines of the math club," "the best problem solver," "the top achiever"—and her mentors view her more as a "valued colleague" than as a student.

Do often provided original, alternate proofs to homework problems and theorems from lecture that were often more efficient and more general than the standard arguments. Do exhibited the same knack for honing in on more elegant proofs in her research as well, enabling her to "find much simpler and shorter arguments for results from previous papers, and then to use her new insights to solve the vastly more difficult problem at hand." Do played a "crucial" role in her summer undergraduate research group at Michigan in obtaining "results of the highest caliber, which will comprise three long papers that will be submitted to the *Annals of Mathematics*."

Response from Do

It is a great honor for me to receive honorable mention for the Schafer Prize. I would like to thank the Association for Women in Mathematics for this. I am deeply grateful to my REU mentor, Prof. Michael Zieve, whose guidance has shaped my interest in math. Two months working with him was a wonderful experience and changed the way I look at math. I am also thankful to the Mathematics Department of Stony Brook University, to Prof. Moira Chas, Prof. Dennis Sullivan, Prof. Jason Starr and Prof. David Ebin for their great

continued on page 12

help and support. Finally, I want to thank my parents for their constant love and understanding and all my friends for their encouragement, especially those in the Stony Brook math club.

Citation for Rebecca Gleit

Rebecca Gleit is a senior mathematics major at the University of Michigan. Her research career, already well underway, lies at the interface of mathematics, biology, and medicine. Through an REU, independent research courses, and a position in a medical lab, Gleit has been working on human sleep patterns. On the mathematical side, she has been developing models of the neuronal control of sleep-wake regulation. On the clinical side, she is investigating the long-term medical and psychosocial outcomes among pediatric liver transplant recipients.

Gleit has also distinguished herself as a leader of young women in mathematics. She is the co-founder of Michigan's Women in Math club, a highly successful program with over 100 members in just its second year.

Her mentors all note an intellectual capacity and maturity beyond her years. They remark that "she exudes intellectual curiosity and is fueled by the excitement of new discovery" and that she is "deeply passionate about combining mathematics and biology to advance our understanding of both fields." She is currently working on two articles to be submitted for journal publication.

Response from Gleit

I am flattered and grateful to have been selected as an honorable mention for the Schafer Prize. I would like to thank AWM for its continued encouragement for women in mathematics and for the award. There are many people who have encouraged and supported my endeavors in mathematics. Ms. Jennifer Sobczynski, my high school calculus teacher, was the first to encourage me to enjoy mathematics and Dr. Djordje Milicevic encouraged me to pursue it. I would like to thank the entire Mathematics Department at the University of Michigan for all of the wonderful opportunities they have provided me, especially Drs. Gavin LaRose, Victoria Booth, and Daniel Forger for their classes which exposed me to mathematical modeling. I am grateful for the assistance of Drs. Stephen DeBacker and Hala Al Hajj Shehadeh in founding the Women in Math Club. I would also like to thank my research mentors Drs. Victoria Booth and Emily Fredericks for their continued support, help, and advice. Your encouragement has made a large impact on my college experience. Lastly, I would like to thank my parents for their constant love and support.

Citation for Yanghou Hu

Yangzhou Hu is a senior at the Massachusetts Institute of Technology majoring in mathematics and economics. She received an Honorable Mention on the 2011 William Lowell Putnam Competition and has excelled in her many undergraduate and graduate mathematics courses.

Hu has participated in two research programs at MIT. In 2011, as part of MIT's Summer Undergraduate Research Program, she wrote two papers on topics in combinatorics and was "an absolute star of her summer." She explored the enumeration of semiorders and "found an elegant new bijection between semiorders and plane trees." In 2012, she began a project with a team of economics professors at MIT in agricultural economics, impressing them not only with the speed with which she mastered their techniques but also by making independent contributions to the arguments and exposition of their work.

Hu's professors praise her "rare ability... to modify an overly difficult problem into something tractable" and expect her to have a "phenomenally successful career."

Response from Hu

I am deeply humbled and honored to be one of this year's Honorable Mentions for the Alice T. Schafer Prize. I am grateful to AWM for their continuing efforts to encourage and support women in mathematics. Many people have helped make my mathematical journey possible thus far. First and foremost, I thank my parents for their constant love, understanding and support. It would not have been possible for me to make it to MIT without them. I also thank the MIT Math Department for providing a stimulating and challenging environment, which has offered me many interesting classes and profound research opportunities. I have had a great time throughout my undergraduate career, interacting with extraordinary peers and faculty. Specifically, I would like to thank my research mentor and nominator, Professor Stanley, for his invaluable inspiration, continuing encouragement, and great guidance along the whole way. He did everything from suggesting the interesting combinatorics problems to giving his time to help me with my research paper. I thank Professor Jerison for leading the undergraduate summer research program, which proved to be a rewarding and memorable experience. I thank Professor Brubaker for his constant encouragement and belief in my abilities. I also thank Professor Costinot and Professor Kim for their great help, guidance and support. Finally, special thanks are also due to Ruipeng Li, Suiqian Luo, and Hong Huang, who were my fellow teammates on my middle school and high school math team, for helping and encouraging me over the past ten years.

AWM SERVICE AWARDS

AWM presented ten women with the inaugural AWM Service Awards at the AWM Reception. The AWM Service Award, established by the Executive Committee in November 2012, recognizes individuals for helping to promote and support women in mathematics through exceptional voluntary service to the Association for Women in Mathematics. After an inaugural class of ten awardees, the award will be given annually to one or two AWM members in recognition of their extensive time and effort devoted to AWM activities during the previous seven years. Presidents (past, present, and elected) and current officers are not eligible for the award.

From a vast list of volunteers, the inaugural awardees were chosen for their extensive work and service to AWM during recent years.

Margaret Bayer, University of Kansas, for her service since 2003 as the Book Review Editor for the bimonthly *AWM Newsletter*.

Holly Gaff, Old Dominion University, for her service as Web Editor (2004–2012). Holly contributed to and supervised the website redesign by Google volunteers together with the AWM Web Task Force and the website's move to a new host.

Rebecca Goldin, George Mason University, for her service as AWM's representative to the Coalition for National Science Funding (CNSF) and as a member of the Long-Range Planning, Michler Prize, and Policy & Advocacy Committees.

Rebecca Herb, Emerita, University of Maryland College Park, for her service as AWM Treasurer (2004–2012), and her help during AWM's transition from its headquarters at the University of Maryland to the management company STAT.

Victoria Howle, Texas Tech University, as the founder of the AWM Essay Contest in 2001. She secured the initial funding for the contest from Sandia and continued serving on the Essay Contest Committee, which she chaired from 2001 through January 2009.

Pao-sheng Hsu, retired faculty, independent consultant and researcher, for her role in establishing the Teacher Partnership, long-time service on the Education Committee which included representing AWM at the CBMS Forum in 2009 and 2010, and service on the AWM Web Task Force (2008–2010).

Krystyna Kuperberg and Ruth Charney

Krystyna Kuperberg, Auburn University, for her service as a member of the AWM Executive Committee (2004–2008) and as a PI and co-PI on two AWM travel grants from the National Science Foundation (2005–2009; 2009–2013).

Rachel Kuske, University of British Columbia, as the founder of the Mentor Network in 2001, which she managed until 2007. At that time she helped with the transition to have it run by a committee and served on the committee in an advisory capacity.

Shari Moskow, Drexel University, for her service as AWM representative to the Institute for Mathematics and its Application Workshops in 2008 and 2009, as a co-PI on the AWM travel grant from the National Science Foundation and a current Department of Energy grant supporting AWM workshops at SIAM annual meeting, and as a member of the Long-range Planning Committee.

Erica Voolich, mathematics educator, Somerville Mathematics Fund, for her role in establishing the Teacher Partnership and long-time service on the Education Committee, which included representing AWM at the CBMS Forum in 2009 and 2010.

AWM WORKSHOP

Magnhild Lien, AWM Executive Director

The 2013 Joint Mathematics Meetings were held January 9–12, 2013 in San Diego, California. The AWM Workshop for Women Graduate Students and Recent PhDs, usually held at these meetings, followed a different format this year. The first part of the workshop took place Friday evening with a reception and a poster session for graduate students. The workshop continued on Saturday with talks, focused on number theory, by recent PhDs and invited speakers, and a luncheon for workshop participants and mentors. The new format allowed for a larger number of workshop participants as well as greater exposure of their work presented either in a poster or a talk. The workshop was organized by **Kristin Lauter**, Microsoft Research, **Kathryn Leonard**, California State University Channel Islands, and **Bianca Viray**, Brown University, a dedicated group of women whose great ideas and abundance of energy made it a big success.

At the workshop reception held in the Mezzanine Level Foyer of the San Diego Convention Center, twenty graduate students presented their posters. There was a steady stream of conference attendees coming by—and not just for the refreshments! The session was scheduled for one hour and fifteen minutes, but many people stayed longer. Groups congregated by each of the posters, and the graduate students seemed genuinely excited to showcase their work. One of the participants was especially thrilled when her "mathematical hero" stopped by her poster and wanted to discuss her work.

The twenty poster presenters were: **Jacqueline Anderson**, Brown University, **Sofia Ortega Castillo**, Texas A&M University, **Rachel M. Davis**, University of Wisconsin-Madison, **Melanie DeVries**, University of Nebraska – Lincoln, **Holley A. Friedlander**, University of Massachusetts, Amherst, **Aditi Ghosh**, Texas A&M University, College Station, **Courtney Gibbons**, University of Nebraska – Lincoln, **Katelyn J. Grayshan**, University of Notre Dame, **Anna Haensch**, Wesleyan University, **Megan E. Heenehan**, Wesleyan University, **Ashley Johnson**, University of Nebraska – Lincoln, **Kathleen Grace Kennedy,** University of California, Santa Barbara, **Jennifer A. Koonz**, University of Massachusetts, Amherst, **Martha E. Precup**, University of Notre Dame, **Amanda A. Schaeffer Fry**, University of Arizona, **Tracy L. Stepien**, University of Pittsburgh, **Bianca Thompson**, University of Hawaii at Manoa, **Caroline L. Turnage-Butterbaugh**, University of Mississippi, **Kelly Brooke Yancey**, University of Illinois at Urbana-Champaign, and **Laura Zirbel**, University of California, Santa Barbara. For titles of the posters see http://research.microsoft.com/enus/events/awm2013/default.aspx.

Poster session reception

Presenters and mentors at the workshop luncheon: Rachel Davis, Lola Thompson, Alina Bucur, Michelle Manes, Aditi Ghosh, and Tracy Stepien

The two-hour luncheon on Saturday included time for the graduate students to meet with their mentors. The attendees at the luncheon included the workshop participants, the mentors, the workshop organizers, the AWM president, the AWM president-elect, and the AWM Executive Director.

The talks at the workshop were given by both senior and junior female researchers in number theory. Many of the talks were reports on papers which were outcomes of the WIN collaboration conferences, WIN1 and WIN2, held at Banff International Research Station (BIRS) in 2008 and 2011. Collaboration groups formed at those conferences have

continued to work together to complete their projects and to publish them in the proceedings volumes or in journals. Many of these groups have gone on to launch follow-up projects. The first talk in the morning was given by Chantal David, who has just been awarded the Krieger-Nelson Prize for outstanding research contributions by a female mathematician in Canada. The last talk of the morning was presented by Ling Long, who was the AWM Ruth Michler Prize winner in 2011/2012. Rachel Pries presented the first talk in the afternoon. She began by announcing that WIN3 had been funded to take place at BIRS in 2014, to loud applause from the audience. Many of the talks were given by junior members of the collaboration groups, and all were widely commended on their effective presentations and interesting content. The talks were attended by a broad audience of primarily number theorists, which was usually equally divided by gender and reached a maximum of nearly 80 at various times.

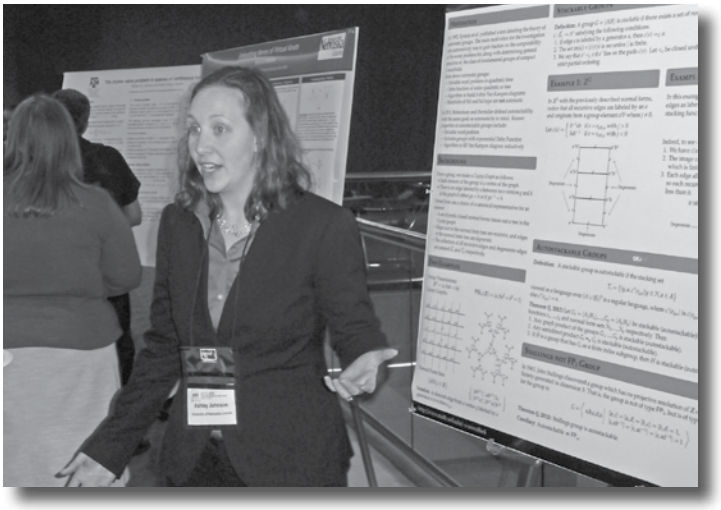
The sixteen workshop speakers were: WIN group leaders who were invited and who spoke on their groups' work, **Alina Bucur**, UCSD, **Mirela Ciperiani**, University of Texas-Austin, **Chantal David**, Concordia University, Montreal, **Ling Long**, Iowa State University, **Michelle Manes**, University of Hawaii, and **Rachel Pries**, Colorado State University; and recent PhDs who spoke either on their groups' project or on their thesis work, **Jennifer S. Balakrishnan**, Harvard, **Ana Caraiani**, University of Chicago, **Elena Fuchs**, UC Berkeley, **Beth Malmskog**, Colorado College, **Ekin Ozman**, University of Texas-Austin, **Hatice Sahinoglu**, Max Planck Institute, **Lauren Thompson**, University of Georgia, Oxford, **Christelle Vincent**, Stanford, and **Cassie Williams**, James Madison University. For titles of the talks see http://research.microsoft.com/en-us/events/awm2013/default.aspx.

This workshop was made possible by funding from the National Security Agency.

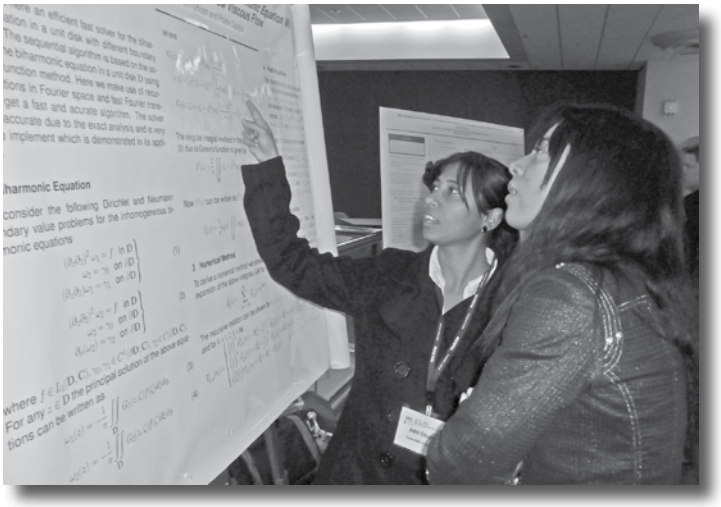
A special thanks to **Hasina Akter**, **Alina Bucur**, **Amy Ksir**, **Michelle Manes**, **Cathy O'Neil**, **Rachel Pries**, **Alice Silverberg**, **Audrey Terras**, **Doug Ulmer**, and **Carolyn Yackel** for serving as mentors to the graduate students. They shared their varied experiences and provided invaluable guidance.

More Next Issue

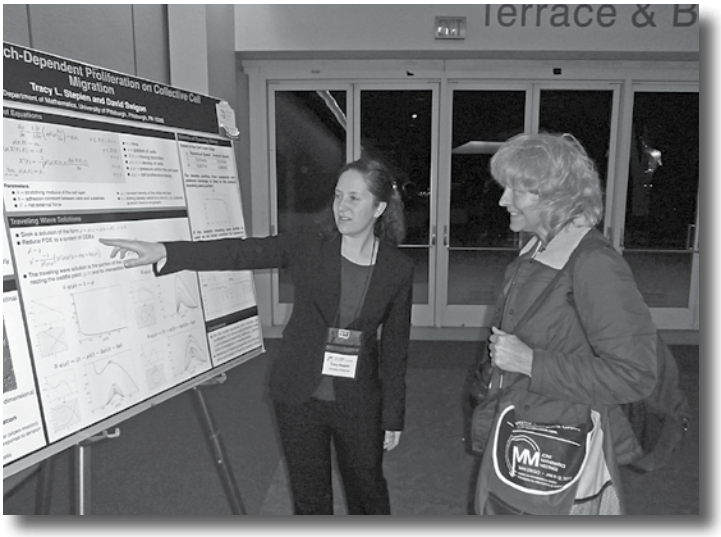
Citations and responses for prizes and awards given by other societies at the JMM will appear next time, as will more photos from AWM events.



Ashley Johnson explaining her poster



Aditi Ghosh explaining her poster



Tracy Stepien explaining her poster to Sylvia Wiegand

ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM Research Symposium 2013
Santa Clara University March 16 – 17, 2013

- **ORGANIZERS:**
  Helene Barcelo, MSRI
  Estelle Basor, AIM
  Georgia Benkart, University of Wisconsin-Madison
  Ruth Charney, Brandeis University
  Frank Farris, Santa Clara University
  Jill Pipher, Brown University and ICERM

- **PLENARY SPEAKERS:**
  Inez Fung, UC Berkeley
  Maryam Mirzakhani, Stanford University
  Lauren Williams, UC Berkeley

- **SPECIAL SESSIONS on a wide-range of topics in pure and applied mathematics:**
  Algebraic Combinatorics, Analysis of PDEs in Newtonian and Non-Newtonian Fluid Mechanics, Commutative Algebra, Climate – Modeling, Groups and Geometry, Harmonic Analysis and Its Applications, Low-dimensional Topology, Mathematics for Human Physiology and Disease, Model Theory: Special Session in Honor of Carol Wood, Numerical Methods for PDEs, Random Matrix Theory and Related Fields

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

- **CONTRIBUTED PAPER SESSIONS**

- **PANEL:** a discussion of the "imposter syndrome"

- **BANQUET**

For details on registration, housing, and the special sessions visit
http://www.msri.org/web/msri/scientific/workshops/show/-/event/Wm9752

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MSRI Mathematical Sciences Research Institute

ASSOCIATION FOR
WOMEN IN MATHEMATICS

AWM Workshop for Women Graduate Students and Recent PhDs at the 2014 Joint Mathematics Meetings

Application deadline: August 15, 2013

For many years, the Association for Women in Mathematics has held a series of workshops for women graduate students and recent PhDs in conjunction with major mathematics meetings. We have received support from the National Science Foundation for the AWM Workshop to be held in conjunction with the Joint Mathematics Meetings in Baltimore, MD in January 2014.

FORMAT: The new format, which started in 2013, presents research talks focused on a research theme that changes from year to year. In addition, a poster session for graduate students includes presenters from all fields of mathematics. The AWM Workshop talks in Baltimore in 2014 will focus on image analysis, computational geometry, and computer vision. Participants will be selected in advance of the workshop to present their work. Recent PhDs will join senior women in a special session on image analysis, computational geometry, and computer vision where they will give 20-minute talks. The graduate students will present posters at the workshop reception and poster session. AWM will offer partial funding for travel and hotel accommodations for the selected participants. The workshop will also include a reception and a luncheon. 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 and posters. Departments are urged to help graduate students and recent PhDs who are not selected for the workshop to obtain institutional support to attend the presentations.

MENTORS: We also seek volunteers to act as mentors for workshop participants. If you are interested in volunteering, please contact the AWM office at awm@awm-math.org by **September 15, 2013**.

ELIGIBILITY: To be eligible for selection and funding, a graduate student must have made substantial progress towards her thesis and a recent PhD must have received her PhD within approximately the last five years, whether or not she currently holds 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 title of the proposed poster or talk
- an abstract in the form required for AMS Special Session submissions for the Joint Mathematics Meetings
- a curriculum vitae
- 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, 2013**. See http://www.awm-math.org/workshops.html for details.

BOOK REVIEW

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

Recoding Gender: Women's Changing Participation in Computing, by Janet Abbate, The MIT Press, ISBN 978-0-262-01806-7

Reviewer: Marge Bayer

Consider this review a sequel to Gwen Spencer's review of *Gender Codes: Why Women are Leaving Computing*, edited by Thomas Misa. Abbate was herself a contributor to *Gender Codes.* Her essay in Misa's book was called "The Pleasure Paradox"; it contained many quotes about the fun and excitement of computing from women who worked as programmers in the 1950s through 1980s. *Recoding Gender* expands on the rewards of the computing profession for women in the earlier years. Based on oral history, it is rich with cultural history—the culture of the computer and software enterprises in the US and Britain.

In the early days of computing, it was not clear where companies could recruit programmers and how they could evaluate applicants. At the very beginning, the only people in the US who had anything like programming experience were the human (mostly women) computers who worked for the government during the war. So in the 1950s women held a significant number of programming jobs. But the demand increased quickly, and with experienced programmers scarce, companies needed measures that would predict that an applicant would be trainable as a programmer. A college degree was preferred in spite of the fact that even a math or engineering degree did not actually prepare students for programming work. In addition, the pool of college graduates was not large enough. An emphasis on education and experience in mathematics, engineering and business made it more difficult for women to break into the programming profession. And sometimes, the bias towards hiring men became explicit.

The author reminded me that until the mid-70s, it was legal, and quite common, for job ads in Britain to specify the gender of applicants sought. (In the US, such ads were outlawed about ten years earlier.) I say "reminded" because I lived in England for a year, 1972–73; I saw ads for clerical positions that specified "girls wanted"—I believe they even gave an age range (but race was not specified ...). I also saw first-hand that year the training of future programmers. At a "technical college" I took a course that prepared students for the A-level exam in computer science. The students in this program were not headed to university, but to the job market. Some were already employed, and their employers were paying for this training so that they could work as programmers. Because of the British exam system, this sort of training was more uniform in Britain than in the US, where it often occurred in commercial trade schools.

To help evaluate job applicants, computer manufacturers developed aptitude tests that were widely used in the 1960s. These focused on mathematical and logical skills. Many businesses used these to evaluate applicants without college degrees. They may not have been successful: "Studies that did attempt to correlate aptitude test results with actual programming performance often failed to find a connection." [p. 52] But the use of these tests could be helpful to women, by providing a less biased criterion for hiring, and one that did not depend on scientific education. Indeed, a couple of the women interviewed for this book by Abbate attribute their opportunity to enter the programming profession to the aptitude test. Some companies used these tests to identify potential programmers from the ranks of clerical and operator positions within the company, sometimes resulting in movement of women into professional careers. On the other hand, some managers allowed gender stereotyping to override the test results in their hiring decisions.

One of the most interesting topics in the book is the development of women's consulting firms. A fair number of women were employed by computer manufacturers and other companies requiring programmers in the 1950s and 1960s, in both the US and Britain. But laws and tradition restricted women from working during pregnancy, and business practices did not allow for part-time work. Abbate describes some women who were able to freelance from home, often by performing some of the work assigned to husbands or friends. One British woman, Stephanie Shirley (a Jewish refugee from Germany), and one American woman, Elsie Shutt, made a significant impact on women's employability. Each started a consulting firm that provided programming services to a variety of companies. This in itself was a major innovation; before this, programs were purchased with the hardware or were written by company staff. But the radical contribution of these consulting firms was that they primarily employed stay-at-home mothers. Shutt's firm stayed small (at most 13 employees), but it stayed—at the time of Abbate's interview with Shutt, the firm had survived for 45 years. Shirley's British firm, however, grew a lot: when, in 2007, it was taken over by IT giant Steria, it had revenues of $750 million. (By the way, as head of her company Stephanie went by the name "Steve." We do not need to guess why she felt that necessary.) In 1975 Parliament passed the Sex Discrimination Act, which put an end to gender specific job ads and to Shirley's company's practice of hiring only women. Shirley retired from the company in 1993; a rich woman, she became a prominent and influential

philanthropist. She has received numerous honors, including being named Dame Commander by the Queen.

As Gwen Spencer discussed in her review, women played a significant role in programming computers from the early days, after World War II, through the 1970s. Abbate discusses some of the factors in the profession that contributed to the shift to software engineering as a male domain. The term "software engineering" itself was part of the story. It was established at an international conference sponsored by the Science Committee of NATO in 1968 in Garmisch, Germany. The conference brought together participants from academia, industry and government in part to address software production problems, including labor shortages and production delays. Notable was the complete absence of women at this conference, held at a time when Grace Murray Hopper and other women were prominent software innovators. The introduction of the word engineering to the production of software in part reflected a belief (or hope) that computer programming could be reduced to "a set of clearly specified, standard techniques that produced measurable results." [p.99] In addition, it was a way to increase the status of the profession of computer programming in industry. Abbate notes that IBM in the 1960s had awards designated for engineers but not for programmers. (When Fran Allen received an award for her Advanced Compiler System, it was an award for engineers, although she was not considered an engineer ... and the prize was cuff-links and a tie clip. [p. 104]) As the term software engineering took hold in the 1970s, it contributed to the growing sense that computer programming was a profession for men, for indeed engineering was much more heavily dominated by men than computer programming had been up to that time. "In this cultural context, the engineering metaphor could not be gender-neutral." [p. 103] And, of course, a decrease in the proportion of women in the field was also seen as increasing the status of the profession.

The last chapter of Abbate's book is on gender in academic computing. We are familiar with the trajectory here. The percentage of bachelor's degrees in computer science earned by women peaked in the mid-80s. Abbate focuses on some bright spots. She gives some examples of British women who were able (in the 1960s through early 1990s) to obtain faculty positions in computer science departments in spite of nontraditional education and career paths. In some cases this happened as British polytechnics were incorporated into the university system. Several of the women interviewed talked about the importance of connections they have made in professional societies. The book ends with a discussion of Anita Borg's efforts to support women in computer science, including the Grace Hopper Celebrations of Women in Computing, the listserv Systers (now 25 years old), and the Institute for Women and Technology (renamed for Anita Borg after her death in 2003).

Abbate did a very good job of taking oral histories and producing a coherent picture of the development of the profession of computer programming/software engineering. And here's a great thing: the transcripts of her oral interviews are all available through the IEEE Global History Network, at http://www.ieeeghn.org/wiki/index.php/Oral-History: Women_in_Computing. The interviews were held in 2001 and 2002. I hope she plans an update. It would be fascinating to learn of the experiences of these women in the last ten years and to hear from women who joined the profession more recently.

CALL FOR NOMINATIONS

2014 Louise Hay Award

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

The nomination documents should include: a one to three page letter of nomination highlighting the exceptional contributions of the candidate to be recognized, a curriculum vitae of the candidate not to exceed three pages, and three letters supporting the nomination. It is strongly recommended that the letters represent a range of constituents affected by the nominee's work. Nomination materials for the Hay Award shall be submitted online. See the AWM website at www.awm-math.org for nomination instructions. Nominations must be received by **April 30, 2013** and will be kept active for three years. For more information, phone (703) 934-0163, email awm@awm-math.org or visit www.awm-math.org.

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.

Mathematics: Sexy Sales Pitches to Attract Women

Jackie Dewar, Loyola Marymount University, Los Angeles, CA

Do we really need to "sell math to girls" today? Hasn't the women-in-mathematics problem been solved (Jackson, 2004)? Certainly some think so. In a recent conversation regarding an idea for a book that would, among other things, provide information about role models for women in mathematics, a book editor told me he didn't think that gender equity in mathematics was such a big problem anymore. Others would disagree. Two recent commentaries, one by David Bressoud (2012), past president of the MAA, in his online *Launchings* column and another that appeared on the back page of *Math Horizons* (Becerra & Barnes, 2012) point out that the percentage of women undergraduates choosing a mathematics major is failing to keep pace with general trends.

The AAUW (2010) report *Why So Few?* noted that encouraging more girls and women to enter STEM fields would "require careful attention to the environment in our classrooms and workplaces and throughout our culture." The report's Executive Summary (p. 5) stated:

> Parents and educators can do a great deal to encourage girls' achievements and interest in math and science. Negative stereotypes about girls' "innate" ability in mathematics and science persist and are harmful in measurable ways. Even a subtle reference to gender stereotypes has been shown to adversely affect girls' math test performance. Stereotypes also influence girls' self-assessments in math, which influence their interest in pursuing science, technology, engineering, and mathematics subjects and careers. Fortunately, research also shows that actively countering stereotypes can lead to improvements in girls' performance and interest in math and science.

Approaches to counteracting stereotypes can vary greatly, and certainly include longstanding efforts such as the Expanding Your Horizon Career Days (http://www.expandingyourhorizons.org/) and Sonia Kovalevsky High School Math Days (https://sites.google.com/site/awmmath/programs/kovalevsky-days). But Madison Avenue (a reference to the American advertising industry) tells us that sex sells. Intentionally or unintentionally, this tenet seems to be a driving force behind a number of recent sales pitches to young women about mathematics or math-related fields. Here are three examples.

1. Danica McKellar (UCLA math major and Winnie from the TV show *The Wonder Years*) picked sexy titles for her latest two math books aimed at junior high and high school girls: *Girls Get Curves: Geometry Takes Shape* (2012) and *Hot X: Algebra Exposed* (2011).

2. Last year the European Commission, the European Union's executive body, launched a campaign designed to attract more women to a career in science, called *Science: It's a Girl Thing* (see http://science-girl-thing.eu/en). The launch was accompanied by a video by the same name that was roundly criticized (see http://www.youtube.com/watch?NR=1&feature=fvwp&v=x3eZQHwGQE0 and http://www.irishtimes.com/newspaper/ireland/2012/0623/1224318509582.html). The original video, no longer on the official EC website, can still be viewed on YouTube (see http://www.youtube.com/watch?v=g032MPrSjFA). Following the controversy, the European Commission wrote a four-page FAQ sheet discussing the creation of the trailer as well as the decision to remove it (see http://science-girl-thing.eu/files/about/about-science-girl-thing-en.pdf).

3. The Science Cheerleaders, a group of professional cheerleaders pursuing science careers, aim to alter the image of scientists and engineers through their website (http://www.sciencecheerleaders.com) showcasing the scientific studies or careers of individual cheerleaders as well as their performances at events such as the U.S.A. Science and Engineering Festival.

So what are we to make of these efforts? Should we welcome any and all attention given to the task of encouraging young women to consider mathematics? Your reaction may well vary from one to the next of the above examples, and might change over time.

The remainder of this article concerns the science cheerleaders and a video from their appearance at the 2010

U.S.A. Science and Engineering Festival in Washington, D.C., which you can view at http://www.youtube.com/watch?feature=player_embedded&v=HtPGIzLuBVQ. My initial reaction, and that of several women colleagues in my department, to this video was rather negative. The video seemed too focused on the sexiness of the cheerleaders and not enough on their scientific accomplishments. By the way, the last 35 seconds of the video shows the cheerleaders "busting down stereotypes." After being sent the link to the video by one of my colleagues, two 12-year old girls texted this reaction: "This specific video is not encouraging. The women's accomplishments, how many schools they have gone to, were amazing. Their costumes were a little showy. We didn't think that they would be that smart … they are just like showgirls. Overall this video is encouraging only to people who want to be cheerleaders."

Last semester I happened to be team teaching a course on Women and Mathematics, so the whole class watched the video. The following comment by a future elementary teacher concentrating in mathematics provides a good summary of the general reaction to the video:

> In terms of "effective" I would imagine that it is. It portrays the sciences as "cool" because it used cheerleading, also "cool," as the vehicle to communicate the message of science as enjoyable. However, I disagree with the method because it continues to feed into and perpetuate the objectifying that women undergo. Perhaps the real problem I have is with cheerleading in general. However, I must acknowledge positives of this organization in that it gives children a new vision of what a scientist or a mathematician looks like. I just wish it was coupled with a reminder to kids that women don't always have to be "pretty" dancers with makeup, but that if they are, it's OK.

Provided with encouragement and a safe space to respond, a distinctly different perspective came forth as well, from a double major in math and dance: "This video is very positive in my opinion.… I think it is a great way to show scientists can be pretty, fun and feminine while also showing that cheerleaders and dancers are smart educated women."

Upon further discussion, the students began to agree that this video would appeal to younger girls, cheerleaders and, as they put it, feminine girls who are also smart. In other words, for the video to be effective, the person watching would have to identify with or relate to the cheerleaders as role models or mentors. Indeed, as I delved deeper into the science cheerleaders' website before writing this article, I learned that among the young women in this country there are 3 to 4 million cheerleaders. The science cheerleaders' message is that science is accessible to all! The video from the more recent 2012 festival (http://www.youtube.com/watch?feature=player_embedded&v=ii7IDz86Lh8) presents that message much more clearly. No doubt my initial judgment was clouded by my own negative stereotyping of buxom cheerleaders. Still, when the cheerleaders teamed up with NSF, NBC, and the NFL to produce a series of videos on the science behind NFL football (see http://www.sciencecheerleader.com/2010/09/now-live-nbc-nsf-and-the-nfl-present-science-of-nfl-football-series/), I wish that the cheerleaders had been given a more substantive role than simply introducing each video.

I hope you will take a few minutes to look at the website and the videos and discuss what you see with colleagues and students of all ages. The *Newsletter* welcomes more discussion on this topic. Send your comments to the Media Column editors.

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AAUW. (2010). *Why So Few? Women in Science, Technology, Engineering, and Mathematics.* [Accessed 1/19/13 at http://www.aauw.org/learn/research/whysofew.cfm]

Becerra, Linda & Ron Barnes. (2012, September, p. 34). Measuring Women's Progress in Mathematics. *Math Horizons.* Mathematical Association of America. [Accessed 1/19/13 at http://dx.doi.org/10.4169/mathhorizons.20.1.34]

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Jackson, Allyn. (2004, August). Has the women-in-mathematics problem been solved? *Notices of the American Mathematical Society,* 51(7), 776–783. [Accessed 1/19/13 at www.ams.org/notices/200407/comm-women.pdf]

EDUCATION COLUMN

Math Modeling Vital in Upcoming K–12 Science Curriculum Standards

Suzanne Lenhart and Kelly Sturner, National Institute for Mathematical and Biological Synthesis, University of Tennessee

Just as Common Core State Standards in Mathematics (CCSSM) are rearranging the landscape of K–12 mathematics education in the United States, science is next—and with these new "Next Generation Science Standards" (NGSS), mathematics proficiency will play a major theme. Math educators of K–16 will do well to pay attention to this movement, as its waves will surely affect our students and our colleagues in science. We may be called upon to lend a hand in helping give science teachers insight into math pedagogy, and we may also hope to see additional interest in mathematics among students thanks to this effort to highlight its relevance to science, engineering and technology.

The NGSS underwent a second period of public review in January, and it would seem that they will released in a finalized form some time in 2013. After that, states will choose whether to adopt these standards, and just as with CCSSM there will likely be federal incentives to do so. The National Governor's Association and the Council of Chief State School Officers turned their attention to science after the completion of the CCSSM and discovered that recommendations for national science standards had not been revised for 15 years. The National Research Council was enlisted to help draft a new set of recommendations. The result, which came out in 2012, is *A Framework for Science Education: Practices, Cross-Cutting Concepts, and Core Ideas,* a free-to-download report on the National Academies website and highly recommended as a field guide to the standards to come and the intentions behind them.

The authors of *Framework for Science Education* made it clear that mathematics is key to scientific literacy. The authors of the NGSS have been careful not to require mathematics proficiencies before the content has been introduced in the mathematics standards. Furthermore, just as the CCSSM feature an emphasis on "Mathematical Practices" interwoven throughout the framework, so too will the NGSS feature "Scientific and Engineering Practices." It's notable that two of the eight science and engineering practices mention quantitative skills explicitly ("Using mathematics and computational thinking" and "Analyzing and interpreting data"), and one more implicitly ("Developing and using models"—mathematical and computational models being just two possible types of model, as scientists also consider conceptual models, diagrams, physical replicas and analogies to be important tools in this category). Mayes and Koballa (2012), in a recent article in *Science Scope,* connect mathematical practices with practices from NGSS showing alignment of all eight of CCSSM's Mathematical Practice areas with all of the NGSS's Scientific and Engineering Practices.

The new emphasis on modeling in K–12 education is beginning to generate interest in the mathematics community. The National Science Foundation together with SIAM sponsored a workshop on "Modeling Across the Curriculum" on August 30–31, 2012. The theme was to increase mathematical modeling activity across the undergraduate curriculum, develop STEM high school courses based on modeling, and to assess college STEM readiness. Participants included university professors, high school teachers, NSF program officers and some representatives from education foundations. This workshop resulted in a session and a panel discussion on this topic at the 2013 Joint Math Meetings. We also note that many of the Mathematics of Planet Earth (MPE) sessions at the meetings included education components with modeling. Looking ahead to 2014–2015, there will be six NSF sponsored workshops continuing the MPE theme with research and education components; the initiative and leadership of these workshops are coming through Fred Roberts at DIMACS, Rutgers University.

Teaching modeling to high school students and engaging younger students in the modeling practice highlights the issue of developing modeling competence in their teachers. There needs to be an effort to engage teachers in modeling problems for which they have appropriate science and mathematical background. Modeling activities should be flexible enough to incorporate a variety of math standards, involve open-ended activities, and use descriptive, analytic and computing tools. The modeling activities should be seen as relevant to the manner in which modeling will be assessed in schools. Such professional activities are being piloted at several universities, including San Diego State University by Susan Nickerson and her colleagues.

The science and engineering standards explicitly discuss computational thinking. The analytic and computing tools required in modeling with mathematics also bring computational thinking to the foreground. A key skill of computational thinking is the ability to create a precise set of

instructions for solving a problem that can be easily followed by a computer. (Barr and Stephenson, 2011) At our university, many freshmen students struggle with introductory computer science courses. And in our freshman mathematics courses, we see students having trouble understanding iterative processes, so building "loops" in simple computer programs may be challenging. While the math community embraces and explores more math modeling in curricula, we should remember the relevance of computational thinking as well!

The standards are learning outcomes but they are also instructional strategies to achieve these learning outcomes; they are both ends and means (Bybee, 2011). We have an opportunity in this changing landscape for our students K through college to have coherent and focused preparation for engaging with science and mathematics content through aligned science and mathematics practices.

Resources

Barr, V. and C. Stephenson, Bringing Computational Thinking to K–12: What is involved and What is the role of the Computer Science Community? *ACM Inroads* 2:49–54, 2011.

Bybee, R. W. Scientific and Engineering Practices in K–12 Classrooms: Understanding A Framework for K–12 Science Education. *Science Scope* 35:6–11, 2011.

Mayes, R. and Koballa, T.R.. Exploring the Science Framework: Making connections in math with the Common Core State Standards. *Science Scope* 36: 15–22, 2012.

National Research Council. *A Framework for K–12 Science Education: Practices, Crosscutting Concepts, and Core Ideas.* Washington, DC: The National Academies Press, 2012.

Next Generation Science Standards website: www.nextgenscience.org

IM&E and the CCSSM

Ellen Whitesides, Director of Common Core Projects, Institute for Mathematics and Education

In June of 2010 the National Governors Association (NGA) and Council of Chief State School Officers (CCSSO) released the Common Core State Standards for Mathematics (CCSSM). These have been adopted by 45 different states as well as a number of territories and the District of Columbia. Now, for the first time, K–12 students in different states will be held to the same rigorous achievement expectations, aimed to prepare them for college and careers. This consistency in desired achievement leads to the possibility of increased collaboration between different states as we all work towards the same standards. Because the Institute for Mathematics and Education (IM&E) at the University of Arizona was founded by lead writer of the Common Core, Bill McCallum, it is well positioned to assist in understanding and implementing the new standards. At IM&E, we have developed several projects (described on our website: http://ime.math.arizona.edu/commoncore/) to work together towards this implementation.

Illustrative Mathematics, http://illustrativemathematics.org/, is a project of the Institute that seeks to help teachers and other educators understand the Common Core State Standards for Mathematics and to build a community of teachers, mathematicians, and mathematics educators who work to improve their own teaching and learning through the sharing of resources and peer feedback. Blossoming from the idea of building an online resource sharing center into the development of a searchable website and vibrant online community, Illustrative Mathematics is now a virtual destination for people interested in K–12 mathematics education. Armed with a new interface in the 2011–2012 school year, the website now hosts more than 600 tasks and 9,000 registered users. It includes not only tasks illustrating the Standards for Mathematical Content but also illustrations of the Standards for Mathematical Practice, as well as an illustration of how fractions develop across grade levels in the Common Core.

The IM&E runs periodic large-scale weekend conferences for an audience of teachers and district level mathematics specialists to learn about the mathematics of the Common Core. The facilitators for these workshops are mathematics teachers, mathematicians, mathematics educators, math coaches, and district math specialists who work together to bring a variety of expertise to the workshop. The next large-scale workshop occurs on the weekend of March 1–3, 2013 in Syracuse, New York.

The Mathematics Common Core Toolkit, run by the institute, is a one-day add-on to existing professional development that includes materials useful for understanding and teaching the Common Core designed by teachers. Initiated by the Committee on Teachers as Professionals (c-TaP), an ad-hoc committee of the Conference Board of the Mathematical Sciences (CBMS), this online Toolkit aims to address four main themes through multi-media content including videos, example tasks, student work, progressions documents, excellent lesson examples, and interactive

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activities. Its themes include the structure and progression of the standards, specific language used in the standards, the eight Standards for Mathematical Practice, and the alignment of a task to a specific standard or cluster. Facilitation of Toolkit is available for interested schools and districts through application on the IM&E website: http://ime.math.arizona.edu/2012-13/toolkit.html.

The Progressions for the Common Core State Standards are narrative documents describing the progression of a topic across a number of grade levels, key connections among standards, cognitive difficulties and pedagogical solutions, and details on particularly knotty areas of the mathematics. Informed both by educational research and by the structure of mathematics, their audience includes teachers, teacher educators, curriculum and test developers, and others involved with mathematics in schools or teacher education. The current draft versions are based on the original documents that writers used to produce the Common Core Standards and are now being revised and released for public comment. These are available on the IM&E website: http://ime.math.arizona.edu/progressions/.

Intel Math is an 80-hour professional development course in mathematics content for K–8 teachers. The program was adapted from the Vermont Math Initiative developed by Dr. Ken Gross. The course is collaboratively taught by a mathematician and a mathematics educator. Intel Math is in the process of being updated in order to support teachers transitioning with their school districts towards alignment with the Common Core.

The Council of Chief State School Officers was one of the organizations that came together, with the National Governors Association, to produce the Common Core. Within the CCSSO, the IM&E advises the State Collaborative on Assessment and Student Standards (SCASS) focused on mathematics. The SCASS is a collaboration of (currently) 15 states whose mathematics specialists meet in person three times yearly to discuss state level mathematics issues.

Bill McCallum also maintains a blog developed to assist the implementation of the Common Core. The blog includes forums where teachers, math specialists, mathematicians, and others ask and discuss questions about specific standards. Bill is quite active in answering questions in the forums. The blog can be found at: http://commoncoretools.me/.

CALL FOR NOMINATIONS

2014 M. Gweneth Humphreys Award

The Executive Committee of the Association for Women in Mathematics has established a prize in memory of M. Gweneth Humphreys to recognize outstanding mentorship activities. This prize will be awarded annually to a mathematics teacher (female or male) who has encouraged female undergraduate students to pursue mathematical careers and/or the study of mathematics at the graduate level. The recipient will receive a cash prize and honorary plaque and will be featured in an article in the *AWM Newsletter.* The award is open to all regardless of nationality and citizenship. Nominees must be living at the time of their nomination.

The award is named for M. Gweneth Humphreys (1911–2006). Professor Humphreys graduated with honors in mathematics from the University of British Columbia in 1932, earning the prestigious Governor General's Gold Medal at graduation. After receiving her master's degree from Smith College in 1933, Humphreys earned her PhD at age 23 from the University of Chicago in 1935. She taught mathematics to women for her entire career, first at Mount St. Scholastica College, then for several years at Sophie Newcomb College, and finally for over thirty years at Randolph-Macon Woman's College. This award, funded by contributions from her former students and colleagues at Randolph-Macon Woman's College, recognizes her commitment to and her profound influence on undergraduate students of mathematics.

The nomination documents should include: a nomination cover sheet (available at www.awm-math.org/humphreysaward.html); a letter of nomination explaining why the nominee qualifies for the award; the nominee's vita; a list of female students mentored by the nominee during their undergraduate years, with a brief account of their post-baccalaureate mathematical careers and/or graduate study in the mathematical sciences; and supporting letters from colleagues and/or students. At least one letter from a current or former student of the candidate must be included.

Nomination materials for the Humphreys Award shall be submitted online. See the AWM website at www.awm-math.org for nomination instructions. Nominations must be received by **April 30, 2013** and will be kept active for three years at the request of the nominator. For more information, phone (703) 934-0163, email awm@awm-math.org or visit www.awm-math.org/humphreysaward.html.

MET II from CBMS

CBMS, November 2012

What mathematics do teachers need to know?

How can mathematicians aid teachers in learning this mathematics, in collaboration with others responsible for teacher education?

Current research and experience are synthesized to answer these questions in the new report *The Mathematical Education of Teachers II (MET II)* from the Conference Board of the Mathematical Sciences. This report updates *The Mathematical Education of Teachers* (published in 2001) and extends its scope from preparation to professional development in the context of the Common Core State Standards for Mathematics.

The audience for the report includes all who teach mathematics to teachers—mathematicians, statisticians, and mathematics educators—and all who are responsible for the mathematical education of teachers—department chairs, educational administrators, and policy-makers at the national, state, school-district, and collegiate levels.

The report's central themes are:

- There is intellectual substance in school mathematics—at every grade level.
- Proficiency with school mathematics is necessary but not sufficient mathematical knowledge for a teacher.
- The mathematical knowledge needed for teaching differs from that of other professions.
- Mathematical knowledge for teaching can and should grow throughout a teacher's career.

Over the past decade, the Math Science Partnerships (supported by the National Science Foundation and the United States Department of Education) and the NSF's Robert Noyce Teacher Scholarship Program have connected mathematicians at institutions of higher education with K–12 school systems, fostering new partnerships and extending existing collaborations. For practicing K–12 teachers, content-based professional development offered by Math Science Partnerships has changed their attitudes about mathematics and increased their mathematical interest and abilities. Moreover, it has increased the achievement of their students.

In several states, Math Science Partnerships have provided strong mathematics preparation for elementary mathematics specialists—teachers who may hold the title elementary mathematics coach, elementary mathematics instructional leader, or lead teacher. A three-year randomized study found that such specialists' coaching of teachers had a significant positive effect on student achievement. Large-scale studies that examine connections between student achievement in earlier and later grades suggest that improved mathematics instruction in preschool and elementary grades has a large payoff in later achievement, not only for mathematics in later grades (including high school), but for reading.

The MET II report gives an overview of such developments and gives recommendations for teachers' preparation and professional development. It devotes separate chapters to mathematics for teachers of elementary, middle, and high school grades. The associated web resources give sources of further information about mathematics in the Common Core and programs for teachers.

Each of the MET II writers is a mathematician, statistician, or mathematics education researcher. They include lead and other writers for the Common Core State Standards and principal investigators for Math Science Partnerships as well as past presidents and chairs of the American Statistical Association, Association of Mathematics Teacher Educators, Association of State Supervisors of Mathematics, Conference Board of the Mathematical Sciences, and National Council of Teachers of Mathematics. The editor of the volume is Cathy Kessel, an AWM past president and long-time member of the AWM Education Committee.

The report may be downloaded free at the Conference Board of the Mathematical Sciences web site: www.cbmsweb.org/MET2. Printed copies may be ordered from the American Mathematical Society at www.ams.org/bookstore-getitem/item=CBMATH-17.

The Conference Board of the Mathematical Sciences (CBMS) is an umbrella organization consisting of sixteen professional societies, including AWM, all of which all of which have as one of their primary objectives the increase or diffusion of knowledge in one or more of the mathematical sciences. Its purpose is to promote understanding and cooperation among these national organizations so that they work together and support each other in their efforts to promote research, improve education, and expand the uses of mathematics.

Opportunities

2014 Summer School

European Women in Mathematics (EWM) and the European Mathematical Society (EMS) Women in Mathematics Committee are pleased to invite proposals for a one week summer school at the Institut Mittag Leffler in Stockholm in summer 2014.

There are places for about twenty young people and two invited lecturers. The Institut will cover lodging and a meal allowance for everyone. The school should be on a focused topic of current importance and open to PhD students and postdocs of both sexes.

A special feature of the summer school is that there will be a much larger than usual involvement by women. We expect that most or all of the organizing committee, at least half the participants, and if possible the lecturers, should be female.

There may be some scope for slightly increasing the number of participants or lecturers; this will have to be negotiated with the Institut nearer the time, as will the exact dates. Participants are expected to fund their own travel expenses, and organizers will have to find additional funding for the speakers, as well as any additional participants. The EMS is supportive of this project and it is likely that they will be ready to assist with some of the necessary additional funding. Additional help and advice will also be given by EWM and the EMS committee.

Proposals, which should be framed according to the guidelines which can be found on the EWM website http://ewm-association.org/, should be sent electronically as a pdf file to secretary@mittag-leffler.se with a copy to susanna.terracini@unito.it by **March 15, 2013**. They will be selected by the committee on the basis of their scientific merit and the extent to which they fulfill the aims of the guidelines.

Project NExT

Project NExT (New Experiences in Teaching) is a professional development program for new and recent PhDs in the mathematical sciences (including pure and applied mathematics, statistics, operations research, and mathematics education). It addresses all aspects of an academic career: improving the teaching and learning of mathematics, engaging in research and scholarship, and participating in professional activities. It also provides the participants with a network of peers and mentors as they assume these responsibilities. In 2013, about eighty faculty members from colleges and universities throughout the country will be selected to participate in a workshop preceding the Mathematical Association of America (MAA) summer meeting, in activities during the summer MAA meetings in 2013 and 2014, and the Joint Mathematics Meetings in January 2014, and in an electronic discussion network. Faculty for whom the 2013–2014 academic year will be the first or second year of full-time teaching (post-PhD) at the college or university level are invited to apply to become Project NExT Fellows.

Applications for the 2013–2014 Fellowship year (the twentieth year of Project NExT) will be due **April 12, 2013**. For more information, see the Project NExT website, http://archives.math.utk.edu/projnext/, or contact Aparna Higgins, Director, at Aparna.Higgins@udayton.edu. Project NExT is a program of the MAA. It receives major funding from the Mary P. Dolciani Halloran Foundation and additional funding from the Educational Advancement Foundation, the American Mathematical Society, the American Statistical Association, the National Council of Teachers of Mathematics, the Association for Symbolic Logic, the W. H. Freeman Publishing Company, John Wiley & Sons, MAA Sections, and the Greater MAA Fund.

For Girls in Science

L'Oreal USA, January 2013

L'Oreal USA has launched www.forgirlsinscience.org, a website designed to inspire and empower girls to pursue careers in science, technology, engineering and mathematics (STEM). Featuring everything from videos of women scientists on the job, a career personality quiz, facts on famous women in STEM, career opportunities in STEM fields to summer and weekend camps, and much more—the website serves up science, technology, engineering and math in a way that is engaging, interactive and, yes, cool.

The website was developed following a series of focus groups with girls ages 13–18, exploring their perceptions about STEM. The focus groups validated the assumption that many young girls are passionate about science, technology, engineering and math but often fall off the path to pursuing careers in STEM because they don't see role models they can relate to or experience science in ways that are compelling to them. The goal of the For Girls in Science website is to foster a much-needed community for young girls to see scientists that they want to emulate, to learn about careers that may interest them, to help them explore and connect with others with similar interests in science, technology, engineering and math. L'Oreal USA also wanted to create a website where budding scientists can learn about STEM in a fun and interactive way.

Doing It All Wrong: First a Mom, Then a Mathematician

Rachel Frankel, University of Cincinnati, Blue Ash College, rachel.frankel@uc.edu

Reading the different experiences of mathematicians on the pages of these newsletters, I was struck by how unique my mathematical journey has been. I returned to an academic full time tenure track career after working only part time (intermittently) for 10 years. I spent those ten years as a full time caregiver to my three children. You see, I did it all wrong.

I got my Bachelor of Science in Mathematics from UCLA, worked as an IT consultant for a couple of years, spent a couple of years volunteering and doing community service, and then went to graduate school at UCLA. One of the first things I heard from a professor when I entered graduate school was "this program isn't for older students, students over the age of 24." I was 25. I got married in the middle of graduate school and spent the last two years researching and writing my dissertation in Paris, France. I defended when I was pregnant with my first child. So, there was no postdoc for me. My advisor and I had no connections in Paris, and I had no convenient nanny, grandmother, or day care with which to leave my baby. I did teach very part-time at the American University.

I had another baby before we moved back to the United States. Again, I was the primary caregiver. I taught part time again while my oldest children attended morning pre-school. Then I had my third child. In all, ten years of part time work. There I was, all my children were in school full time (until 3:30 p.m., that is), 41 years old and searching for a tenure-track academic position.

I had no research agenda. My dissertation was published soon after I got my PhD. The field had moved on without me. In order to restart my research I would need at least a year of full time study. I looked around for grants, programs, anything that could help me—an academic mathematician returning to the workforce after 10 years who needed to restart her research agenda in order to apply for an academic position. All the postdocs stipulated that they were for recent PhDs. Workshops, grants, and awards always had the caveat "for graduate students and recent PhDs." I was haunted by the words of another professor at UCLA, "if you haven't done anything significant in mathematics by the time you are 35, you never will." One of my advisors was realistic as well when I asked him for a letter of recommendation for my application to a 3rd-tier university: "No research? You don't stand a chance."

I then applied for an opening at the University of Cincinnati, Blue Ash College. The College is a branch of the University of Cincinnati located a stone's throw from where I live. It is an open access institution, which means that any student with a high school diploma or a GED can enroll in classes. Approximately 95% of the mathematics courses taught are remedial. I got the job! It hasn't been easy—I am still expected to do research but research in mathematics education is as highly valued as research in mathematics. I have young colleagues, just out of graduate school, who are doing mathematical research in topology, number theory, and the like. I envy them. But I chose a different path and maybe, as I reflect on my family and my students, it isn't so wrong.

As I look through the AWM, SIAM, AMS, and MAA websites I see many resources for new PhDs. I see nothing for older, female PhDs who have taken time off to raise their families and are now looking for positions or research opportunities. Also, I have found that female mathematicians have children only after getting a tenure-track position. I had the kids first, then looked for a tenure-track position. I was wondering if anyone else has a similar story?

AAAS Fellows

Ed Aboufadel, Grand Valley State University, Secretary, Section A (Mathematics), AAAS

The American Association for the Advancement of Science (AAAS) recently announced the election of seven new mathematics Fellows, with an unprecedented number of women in the newest class, including a former president of the AWM. Fellows of the AAAS are recognized for meritorious efforts to advance science or its applications. The seven new Fellows will be officially welcomed in February at the AAAS Annual Meeting in Boston.

Former AWM President Carolyn Gordon of Dartmouth College is being honored for her "important and unexpected discoveries in spectral geometry" as well as her leadership of the AWM, according to the formal citation. She is joined by Susanne Brenner of Louisiana State University, an expert in finite element, multigrid, and domain decomposition methods, and Susan Montgomery of University of Southern California. Montgomery's citation notes her contributions to Hopf algebras and her long involvement with the AMS.

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AAAS FELLOWS *continued from page 27*

Other new Fellows include L. Pamela Cook-Ioannidis (University of Delaware), Susan Friedlander (University of Southern California), and Deborah Frank Lockhart (National Science Foundation). Cook-Ioannidis is known for her "significant contributions to the mathematics of fluids" and her service to SIAM. Friedlander's citation praises her "distinguished contributions to applied mathematics and extraordinary service to the AMS." Lockhart is being honored for her "skillful programmatic leadership at NSF."

The seventh new Fellow in mathematics is Robert Calderbank of Duke University. His citation applauds his "seminal contributions in coding and information theory."

AWM Conflict of Interest Policy

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

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

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

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

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

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The Institute for Computational and Experimental Research in Mathematics

JOB ANNOUNCEMENT: The Institute for Computational and Experimental Research in Mathematics (ICERM) at Brown University invites applications for a part-time **Associate Director (AD) for Diversity Enhancement** on a two-year renewable basis, effective July 1, 2013. The AD will provide leadership in meeting institutional diversity goals and will expand the participation in ICERM activities by members of underrepresented groups.

Responsibilities: Assist in the development of policies and procedures that serve the diversity goals and scientific mission of ICERM. Help plan and organize institute diversity-oriented workshops and events, and ensure that diversity goals are integrated into, and met throughout, ICERM's programs and activities. Represent ICERM on the Mathematical Sciences Institutes Diversity Committee which meets in person annually during JMM and at the Modern Math Workshop at SACNAS, and by conference calls throughout the year. Plan and manage budgets related to diversity initiatives. Help obtain funding for programs, activities, and initiatives.

Qualifications: Ph.D. in Mathematics or related field required. Have some experience in mentoring and/or outreach to women and underrepresented minority groups. Possess excellent communication skills.

Commitment: Part-time/flexible hours with the possibility of working remotely. Will require some travel between ICERM and several conferences each year.

To apply: Submit cover letter and CV to *director@icerm.brown.edu* and arrange for one reference letter to be sent to *director@icerm.brown.edu*. Review of applications will begin immediately and applications will be accepted until the position is filled. More about ICERM can be found at: http://icerm.brown.edu

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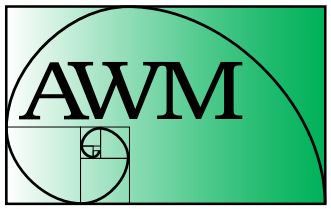

ASSOCIATION FOR
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NORTHEASTERN UNIVERSITY—CHAIR POSITION IN MATHEMATICS—The College of Science at Northeastern University invites applications for the position of Professor and Chair of the Mathematics Department. The Mathematics Department (www.math.neu.edu) at Northeastern is a center of excellence with a nationally and internationally recognized research faculty in pure and applied mathematics. The Department currently comprises 34 full-time faculty with over $4 million in annual federal funding, about 80 PhD and Masters students, and about 240 undergraduate mathematics majors (including dual majors). At the core of the Department are outstanding mathematical research in a broad range of areas, an excellent graduate program with diverse graduate offerings, a vibrant undergraduate program, and highly-regarded educational outreach programs. Key goals of the department include further enhancement of its research and graduate profile through high-level faculty and graduate student recruitment, and increasing its faculty and graduate representation in applied and interdisciplinary areas. The new Chair has a unique opportunity to significantly shape the Department's future growth and direction.

The required qualifications include a PhD degree in Mathematics or a related field; a record of research, teaching and service appropriate for the academic rank of Full Professor of Mathematics; and demonstrated administrative, leadership, and interpersonal skills.

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Please submit a letter of interest, curriculum vitae, the names and contact information for five references, and a brief description of research. Reference letters are not required at this stage and will be solicited by the Search Committee if needed.

Informal inquiries can be addressed to Dr. Egon Schulte, Chair, Mathematics Chair Search Committee, schulte@neu.edu.

The earliest anticipated start date is **July 1, 2013**. Review of applications will begin in February 1, 2013 and continue until the position is filled.

2012–2013 Individual Membership Form

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