ASSOCIATION FOR WOMEN IN MATHEMATICS

Newsletter

VOLUME 46, NO. 5 • SEPTEMBER–OCTOBER 2016

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

Historic progress. I am late writing my report this month after returning from a much-needed vacation, but the lucky outcome is that I am now inspired after having just watched an *enormous* glass ceiling being shattered in Philadelphia tonight, as Hilary Clinton became the first woman ever to be nominated by one of the two major political parties for President of the United States! May we continue to break many more glass ceilings together, and to experience and appreciate the progress which follows such major milestones.

Grants. Here is some outstanding news of our own: the AWM has been awarded a new NSF grant to support graduate student poster sessions at our AWM Workshops at SIAM and JMM for the next two years. The PIs for this grant are President-Elect **Ami Radunskaya**, Meetings Coordinator **Kathryn Leonard**, and Executive Director **Magnhild Lien**. This grant will support graduate students and organizers to attend the 2016 and 2017 SIAM Annual Meetings and the 2017 and 2018 Joint Math Meetings. We are particularly grateful for this support since it helps young mathematicians at a critical time in their careers, allowing them to form new relationships with more senior women at the AWM workshop and mentoring lunch. Thank you, NSF, and Ami, Kathryn, and Magnhild, for making this support for graduate students possible!

The AWM-NSF Travel Grant renewal has also been approved, and a new cycle of travel grants will be available as soon as the award is funded.

2017 AWM Research Symposium. We are delighted to announce that **Deanna Haunsperger**, President-Elect of MAA, will be the recipient of the 2nd AWM Presidential Award, to be presented at the symposium banquet. This award honors her enduring contribution to advancing the mission of the AWM through her work to establish and run SMP, the Summer Math Program. We hope that the symposium will also serve as a reunion for SMP alumnae.

Also, the T-shirt design for the symposium will be determined through the contest open to AWM Student Chapters. See the contest guidelines in the last issue of the newsletter and don't forget to submit your designs for the 2017 AWM Research Symposium T-shirt by **Friday, October 7, 2016**!

Awards. AWM is pleased to announce that **Lisa Jeffrey** will give the Noether lecture at the Joint Math Meetings in January 2017. Please see the press release on pages 3–4 of this issue. Also, at the prize session at JMM 2017, the Humphreys Award will be presented to **Helen Grundman**, and the Hay Award will be presented to former AWM President **Cathy Kessel**.

AWM Dissertation Prizes. Nominations are due October 1, 2016, for the first round of AWM Dissertation Prizes. Up to three outstanding PhD dissertations

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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.

Circulation: 3500.

PRESIDENT'S REPORT *continued from page 1*

by women in the mathematical sciences will be recognized this year, so please consider nominating outstanding candidates to help make this new program a success.

AWM at SIAM 2016 was a great success. **Lisa Fauci** gave the Sonia Kovalevsky Lecture on "Biofluids of Reproduction: Oscillators, Viscoelastic Networks and Sticky Situations."

The 2016 AWM Workshop, "Dynamical Systems with Applications to Biology and Medicine," was supported by the AWM ADVANCE grant and was organized as a follow-up to the WhAM! Conference by **Laura Ellwein**, **Trachette Jackson**, **Ami Radunskaya**, and **Eva Strawbridge**. See the write-up on pages 4–7 of this issue. Thanks to all organizers and presenters for contributing to the AWM presence at SIAM this year!

Participants in the AWM Workshop at SIAM

Springer Series. The next volume in the AWM Springer Series will be devoted to *Mathematics Education: A Spectrum of Work in Mathematical Sciences Departments*, edited by **Jacqueline Dewar**, **Pao-sheng Hsu**, and **Harriet Pollatsek**. The volume is listed on the website for the series and is scheduled to appear in time for JMM 2017. The AWM receives $1,000 in royalties from Springer for each volume in the series.

Although predating the Springer series, the book *Complexities: Women in Mathematics*, edited by former AWM Meetings Coordinator **Bettye Anne Case** and by Newsletter Editor **Anne Leggett**, also generates royalties for AWM: 60% of the royalties are directed to AWM (with the remainder going to their departments). Princeton University Press has just released the book in paperback and in eBook form (available as an eTextbook at Amazon.com and elsewhere). This book began as the proceedings of the AWM Taussky Todd conference, which forms a chapter in the book, and includes extensive material on how women handle their personal and professional lives as mathematicians.

This is a great model for generating revenue to support and sustain AWM: if you are publishing a book, you might consider donating some portion of the royalties to AWM. Thank you!

Planned giving. Former Executive Committee member **Marie Vitulli** has pointed out a new way to make tax-free donations to the AWM: If you are

70½ years old or older, you can give up to $100,000 from your IRA directly to a qualified charity such as AWM without having to pay income taxes on the money. This type of charitable rollover gift can be used to satisfy all or part of your required minimum distribution for the year. More information on this possibility is available at www.awm-math.org.

As the start of the new membership year approaches, I encourage you to join AWM or to renew your AWM membership. Your support is vital to advancing our mission. And as the U.S. presidential election approaches, I encourage you to vote.

Kristin Lauter

Best wishes,

Kristin Lauter
July 27, 2016
La Jolla, CA

Lisa Jeffrey Named 2017 Noether Lecturer

The Association for Women in Mathematics and the American Mathematical Society are pleased to announce that Lisa Jeffrey will deliver the Noether Lecture at the 2017 Joint Mathematics Meetings. Dr. Jeffrey is Professor of Mathematics at the University of Toronto, Canada. She has been selected as the 2017 Noether Lecturer for her contributions and leadership in symplectic and algebraic geometry, focused on connections with theoretical physics.

Lisa Jeffrey

Jeffrey received an AB degree in physics from Princeton University and an MS degree from Cambridge University (Trinity College). She received her DPhil in mathematics from Oxford University in 1992 under the direction of M. F. Atiyah. The work of her thesis provided mathematically rigorous proofs of conjectured statements about three-manifold invariants connected with quantum field theory. Before coming to the University of Toronto in 1998, Jeffrey was a postdoctoral fellow at the Institute for Advanced Study and a research fellow at Downing College, Cambridge University. She held an assistant professorship at Princeton University, followed by an assistant

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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

See www.awm-math.org for details on free ads, free student memberships, and ad discounts.

Executive Sponsorship Levels

$5000+
$2500–$4999
$1000–$2499

Print Subscriptions and Back Orders—Regular and contributing members living in the US may elect to receive a print version of the *Newsletter.* Libraries, women's studies centers, non-mathematics departments, etc., may purchase a subscription for $65/year. Back orders are $10/issue plus shipping/handling ($5 minimum).

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

Newsletter 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 queries/material for columns to Anne Leggett, amcdona@luc.edu. Send all book review queries/material to Marge Bayer, bayer@math.ku.edu. Send all education column queries/material to Jackie Dewar, jdewar@lmu.edu. Send all media column queries/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.

professorship at McGill University. She has also held numerous visiting positions both in Europe and the US.

Jeffrey is best known for her joint work with Frances Kirwan on localization and moduli spaces. They determined the structure of the cohomology ring of the moduli space of representations of the fundamental group of a surface. This was an application of their earlier work, developed to study the cohomology rings of symplectic quotients. More recently, Jeffrey's work has been focused on the based loop group in K-theory. In joint work with Harada, Holm, and Mare, she showed the connectedness of the level sets of the moment map on the based loop group.

In addition to being an AMS Fellow (2013) and a Fellow of the Royal Society of Canada (2007), Jeffrey is the recipient of an E.W.R. Steacie Memorial Fellowship from the Natural Sciences and Engineering Research Council of Canada (NSERC) (2004) and an Alfred P. Sloan Foundation Fellowship (1997). She was awarded the Coxeter-James Lectureship by the Canadian Mathematical Society (CMS) (2001) and also by the CMS, the Krieger-Nelson Prize (2000), which recognizes outstanding research by a woman mathematician. Her research has been supported by numerous grants including three multi-year NSERC Discovery Grants (2002–2016).

Jeffrey has been an active mentor during her years at the University of Toronto. Eleven students have obtained their PhDs under her guidance, and she is currently supervising six more. She has supported numerous postdoctoral fellows, and she has advised many undergraduates and master's students in thesis and reading projects.

The 2017 Joint Mathematics Meetings will be held January 4–7 in Atlanta, GA. The lecture honors Emmy Noether (1882–1935), one of the great mathematicians of her time. She worked and struggled for what she loved and believed in. Her life and work remain a tremendous inspiration. Recent Noether Lecturers include Susan Montgomery, Barbara Keyfitz, Raman Parimala, Georgia Benkart, Wen-Ching Winnie Li, and Karen E. Smith.

AWM Workshop at the 2016 SIAM Annual Meeting

Magnhild Lien, AWM Executive Director,
with Ami Radunskaya and Maria Emelianenko

The 2016 SIAM Annual Meeting was held July 11–15, 2016 in Boston, MA. The AWM Workshop usually held at these meetings followed a new format this year. The first part took place on Monday with research talks on Dynamical Systems with Applications to Biology and Medicine by Recent PhDs & Invited Speakers, supported by the AWM ADVANCE grant, Career Advancement for Women Through Research Focused Networks. Also on Monday, there was a mentoring session and luncheon for all the workshop participants. On Tuesday afternoon the workshop participants attended a career panel entitled "Addressing the Challenges Facing Female Scientists and Mathematicians" and in the evening the graduate students presented their work in the SIAM conference poster session. The new

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AWM ONLINE

The *AWM Newsletter* is freely available online.

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

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

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AWM DEADLINES

AWM-MAA Falconer Lecturer: September 1, 2016
AWM Alice T. Schafer Prize: October 1, 2016
AWM Dissertation Prize: October 1, 2016
AWM Travel Grants: October 1, 2016 and February 1, 2017
AWM-AMS Noether Lecture: October 15, 2016
AWM-SIAM Sonia Kovalevsky Lecture: November 1, 2016
AWM Workshop at SIAM: November 1, 2016
AWM Michler Prize: November 1, 2016
AWM Essay Contest: January 31, 2017
AWM Mentoring Travel Grants: February 1, 2017
AWM Sadosky Research Prize: February 15, 2017
AWM Microsoft Research Prize: February 15, 2017

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AWM Workshop organizers and speakers. Left to right, front row: Tracy Stepien, Shelby Wilson, Laura Ellwein. Back row: Trachette Jackson, Ami Radunskaya, Erica Graham, Karin Leiderman, Selenne Bañuelos, Amy Buchmann. Not pictured: Hwayeon Ryu

format allowed for more interaction between the workshop participants as well as greater exposure of their work presented either in a poster or a talk. Special thanks goes to the workshop organizers **Laura Ellwein**, Virginia Commonwealth (workshop talks and career panel), **Maria Emelianenko**, George Mason University (career panel), **Trachette Jackson**, University of Michigan (workshop talks), **Fengyan Li**, Rensselaer Polytechnic Institute (poster session), **Hoa Nguyen**, Trinity University (career panel), **Ami Radunskaya**, Pomona College (workshop talks), and **Eva Strawbridge**, James Madison University (workshop talks and poster session) and the poster judging coordinator **Joyati Debnath**, Winona State University. Their dedication and enthusiasm while planning the workshop were instrumental in its success.

The AWM workshop talks focused on Dynamical Systems with Applications to Biology. Two sessions consisting of eight talks by participants in the first WhAM! Workshop entertained and intrigued listeners on Tuesday morning and late Tuesday afternoon. The WhAM! Workshop was hosted at the Institute for Pure and Applied Mathematics in September 2013. A volume dedicated to the nine collaborative research projects initiated at that conference appeared in 2015 as part of the IMA Springer Series, co-branded with the AWM logo. Look for it at your favorite bookstore. **Trachette Jackson** and **Ami Radunskaya**, organizers of the WhAM! Workshop, also organized the AWM Workshop talks at SIAM, with the help of **Laura Ellwein** and **Eva Strawbridge**. It was a terrific line-up! The eight talks featured speakers at various stages in their careers, and all of them were excited to present their latest research.

Since biological processes often have natural rhythms associated with them, it's not surprising that several of the talks concerned circadian rhythms, oscillations and synchrony. **Erica Graham** (Bryn Mawr College) discussed some interesting questions about what happens to metabolic dynamics when our circadian rhythm is disrupted, a question that could have a big impact on the management of diabetes. **Hwayeon Ryu** (St. Olaf's College) addressed issues in kidney function in her talk on how pressure oscillations are synchronized in nephrons through vascular and hemodynamic coupling. **Shelby Wilson** (Morehouse College) moved the discussion up into our brains with her talk on how desynchronization of neurons could be accomplished through delayed feedback. In a related topic, **Selenne Bañuelos** (Cal State Channel Islands) talked about a mathematical model that can help us understand the effects of temperature on our brain waves: Do we have better dreams when it's cold? Do we sleep better when it's warm? Oxygen delivery to the brain is critical in infants, and **Laura Ellwein** (Virginia Commonwealth University) gave us some preliminary results on modeling respiratory dynamics in premature babies. Other medical issues relating to the brain come up when studying neurodegenerative diseases, like mad cow disease. **Karin Leiderman** (Colorado School of Mines) described her work in understanding these diseases, which looks at misfolded proteins, called prions, and how they are transmitted during cell division. Another disease of the brain, glioblastoma multiforme, was modeled by **Tracy Stepien** (Arizona State University). In this very deadly disease, mathematical modeling can be critical in informing when and how to treat the tumor. **Amy Buchmann** (Tulane University) showed us the fascinating behavior of fluid near bacterial carpets (you don't want these in your living room!) and how to model the transport of particles near these structures.

Titles and abstracts of the talks can be found at www.awmadvance.org.

Amy's talk, the final one in the morning session, was a nice introduction to **Lisa Fauci**'s Sonia Kovalevsky address

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Selenne Bañuelos, Pamela Pyzza and Jennifer Kyle at the luncheon

right after lunch. Before her talk, Lisa joined us for the mentoring lunch, a central part of the AWM workshop. At the lunch, all the workshop participants, including graduate students, workshop speakers and organizers and other senior women mathematicians, joined together for a tasty buffet (it was big on salads, which we thoroughly enjoyed). Two graduate students were paired up with two faculty who worked in a closely related field. After the mentoring groups got to know each other, participants were encouraged to move to one of the "topics" tables. The topics were "How to write a successful grant proposal," "How to negotiate the job market" and "How to maintain a healthy work-life balance." The discussions at each table were full of nuggets of wisdom, salty stories, and—most importantly—excellent questions. After a half hour, we all switched tables and started up new discussions. We exchanged email addresses and, by the end of lunch, all of us had added at least a few branches to our professional networks.

The career panel, "Addressing the Challenges Facing Female Scientists and Mathematicians," featured female panelists from diverse backgrounds, from a researcher at a rank-one university (**Lisa J. Fauci**, Tulane University) and a liberal arts college faculty member (**Rachel Levy**, Harvey Mudd College) to industry (**Christine Tobler**, MathWorks) and a government lab employee (**Lynn Apfel**, U.S. Department of Defense). Each panelist had a chance to share the highlights of her career and speak about the challenges she faced, followed by a Q&A session which quickly evolved into an informal, friendly open-ended discussion. It was obvious that the panel touched upon some deep issues which most of the audience members could relate to, so original plans to break into small groups were quickly abandoned, and the conversation moved freely under the gentle guidance of **Laura Ellwein** (VCU), panel moderator.

Karen Wood, Erica Graham and Roseanna Gossmann

So what were the key points brought up by this panel? Participants in different age groups obviously had different concerns, but some of the recurring themes included:

1) the sense of insecurity felt by women in men-dominated fields;
2) the isolation some of the women feel when facing the challenging act of balancing career and family, especially after childbirth;
3) the importance of having mentors, especially among senior colleagues, able to support women at various stages of their careers,
4) the challenge of interviewing for a job with a baby on the way, or with a two-body problem either openly (or secretly) playing a major role in the process.

It turned out that while some of these issues are deeply rooted in the double standards applied to men and women at the workplace, which are still plaguing our society despite tremendous progress in recent decades, others are easier to fix. Many senior women shared an opinion that insecurities, to dealing with both teaching and research, to taking time off to cater to family needs, or to expressing one's opinion freely in public, are easier to overcome with the help of a support group. This could be a group of colleagues, or of real or virtual friends, such as the AWM Mentor Network (https://sites.google.com/site/awmmath/programs/mentor-network), or Facebook groups like MathMamas. The important thing is to know that there are others who went down the same path before, who can lend a helping hand and give you valuable advice—this is in fact one of the main goals pursued by AWM as an organization, so it is no surprise that this message was echoed by AWM panel participants.

There were clearly more questions than answers, and sometimes discussion was overrun by frustration or led to differences in opinion. But one thing was clear, it provided a much needed forum for conversation within the community of people who deeply care about the role of women in STEM fields, their struggles and accomplishments, their past and more importantly their future.

The workshop concluded on Tuesday evening with ten graduate students presenting posters during a well-attended joint poster and dessert reception. There was a steady stream of conference attendees coming by—and not just for the desserts! The graduate students seemed genuinely excited to showcase their work. The poster presenters were:

Panelists Lynn Apfel, Rachel Levy, Lisa Fauci, and Christine Tobler

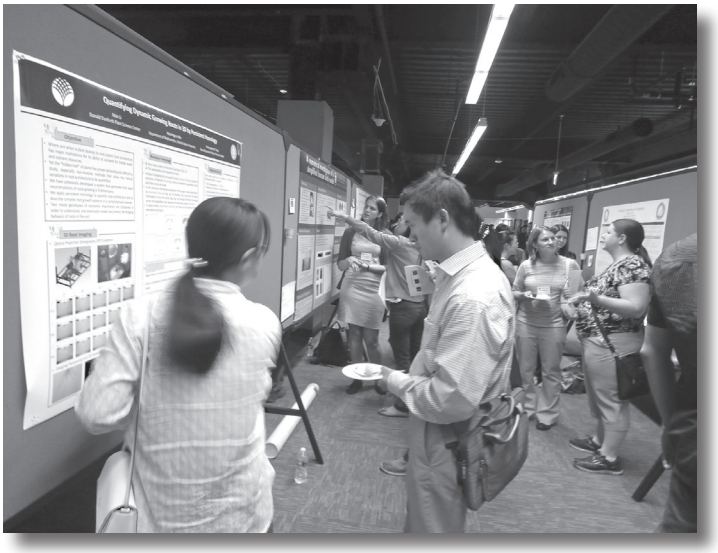
Audience at the panel

Veronica Ciocanel (Brown University), **Karen Cumings** (Rensselaer Polytechnic Institute), **Mao Li** (Florida State University), **Roseanna (Pealatere) Gossmann** (Tulane University), **Jamie Prezioso** (Case Western Reserve University), **Celeste Vallejo** (University of Florida), **Marilyn Yazmin Vazquez** (George Mason University), **Karen Wood** (University of California, Irvine), **Feifei Xu** (Florida State University), and **Yanfang Yang** (Texas A&M University). For titles and abstracts of the posters see http://meetings.siam.org/sess/dsp_programsess.cfm?SESSIONCODE=60237.

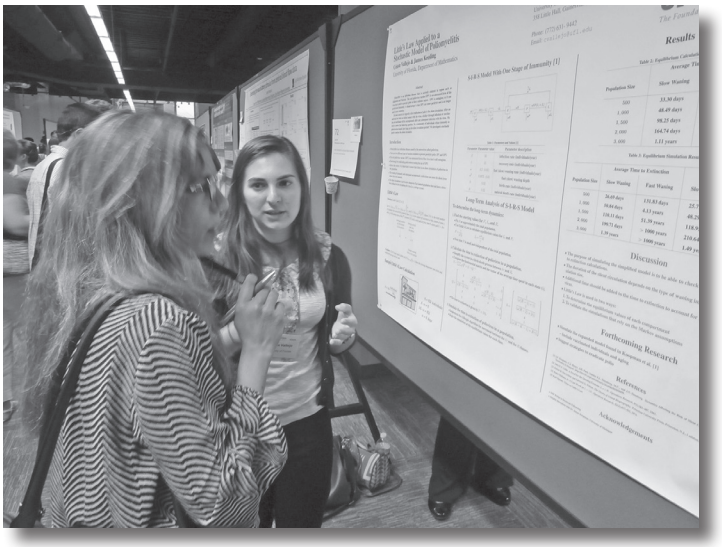
Poster judging, a feature started two years ago, is now a regular part of the workshop. In coordination with the NSF Math Institutes we are able to offer an invitation to participate in a week-long workshop at one of the institutes as a prize for the best poster. The poster judging was skillfully handled by the poster judging coordinator **Joyati Debnath** and sixteen volunteer judges. The winner was **Roseanna (Pealatere) Gossmann** from Tulane University, and **Veronica Ciocanel** from Brown University received honorable mention.

Many thanks to **Joyati Debnath**, Winona State University, the organizer of the poster judging and the volunteer judges **Selenne Bañuelos**, **Chris Bergevin**, **Vrushali A. Bokil**, **Mike Caiola**, **Yanlai Chen**, **Bo Dong**, **Malena Español**, **Kevin Gou**, **Alicia Prieto Langarica**, **Amir Molavi**, **Joseph Rusinko**, **Wanda Strychalski**, **Daniel Tatosian**, **Ashlee Ford Versypt**, **Chong Wang**, and **Ling Xu**. Joyati's tireless effort in organizing this event and the volunteers' eagerness to participate made it all run very smoothly.

This workshop was made possible by funding from the National Science Foundation.



Poster session



Celeste Vallejo by her poster

Interview with Mary Gray

Sarah J. Greenwald, Appalachian State University

Mary Gray is a professor of mathematics and statistics at American University as well as a lawyer. Her areas of research include applications of statistics to human rights, economic equity, legal issues, and education. She was AWM's first president from 1971–1973 and has continued to be involved, e.g., her ongoing work as a part of AWM's Advisory Board. Among other honors, she has earned the Presidential Award for Excellence in Science, Engineering and Mathematics Mentoring and is a fellow of AAAS, AMS, ASA and AWIS.

I met Mary for lunch on August 5, 2015 at MathFest in Washington, D.C. As the MAA was celebrating 100 years, it was a great time to reflect for AWM's 45th anniversary (in 2016). This interview is edited from our conversation. I'm awed and inspired by Mary. Her gumption, strength and willingness to speak up for the rights of others have made a huge difference in many lives. Thanks, Mary, for all that you've given to this organization and the many lives that you've touched.

Mary Gray and Sarah Greenwald

The Beginning Years of AWM

Sarah Greenwald: It's 1971, you're at a MAG meeting and Joanne Darken stands up to ask women to remain and form a caucus. What did you think about her call to action?

Mary Gray: I'm always for action. In fact, that's the reason I was at the MAG meeting. You know that MAG stands for Mathematics Action Group.

SG: Yes, exactly. So had you been involved with MAG before the winter meetings in Atlantic city?

MG: Oh yes.

SG: I read that the male chair at the MAG meeting advised against the women getting together. That seems strange to me since MAG members gathered in support of racial and gender equality (and against the militarization of mathematics). Can you shed any light on this?

MG: Ah … Sarah you're too young. For years I was involved in liberal projects but my moment of awakening to women's right's issues wasn't until the 1968 presidential campaign when I was working for Eugene McCarthy in California. People did lots of different things, but it was the men who did all the interesting things. They had women doing nothing but stuffing envelopes. So one day I said I'd had enough of this and picked it all up and threw it all across the room. That was the last time I had anything to do with left wing politics, for a while anyway.

SG: What happened next in forming AWM?

MG: We talked about what we might do and who was willing to do some of the organizational effort, like sending out lots of letters to people we could find in various kinds of directories. We also wanted to put together a newsletter. Nobody else was eager to volunteer so I said I would do it and get things started.

SG: So then you volunteered to pick up all those tasks and to be Chairman of AWM?

MG: Because I wanted to do something rather than just talk about it.

SG: There's a story about how you democratized AMS Council meetings. Can you tell me about that, and was that at the same conference that AWM was formed?

MG: No, that was at a different conference held at Penn State. By this time we had at least gotten together and talked about things as AWM. We were interested in what AMS was doing about having more women speakers, in particular at the annual meeting. We decided it would be a good idea to go to the council meeting and complain or find out what was going on and see what happens at these meetings. So I decided to go. And when I arrived at the door of the

meeting, Jake Jacobson [Nathan Jacobson], who was the president of the AMS at the time, said to me, "Oh, sorry, but this is for council members only." You probably never knew him, but Jake was about as tall as you, so obviously smaller than me. I said, "No, I read the bylaws and the bylaws say the council meetings are open to all members, and I'm a member." He said, "Well it's by gentleman's agreement." I responded by saying, "I'm no gentleman" and sat down.

SG: I've read that you operated AWM in a file drawer in your study?

MG: It was not really a file drawer. Just stacks of papers on a desk. We set up a card table and the AWM stuff was on the card table beside the desk.

SG: I had the chance to interview Joanne Darken just a few months ago. She said that it was advantageous that you were an associate professor, since some other founding members were grad students.

MG: Well, on the other hand, my theory is that if you are not an activist before you get tenure, then you are never going to be an activist. I find it distressing that people are afraid to open their mouths.

SG: With that in mind, your career is full of examples where you spoke up against discrimination and injustice, even for smaller things like when you saw someone wearing a tie that said male chauvinist pig. How did you find the strength to speak up, especially in those settings?

MG: There was an interesting article just recently about 1000 knife cuts from a younger female scientist who worked in a field that was male dominated. It was about all of the little things, that time after time after time, tended to discourage women from continuing, and made it more difficult for them to go forward. It wouldn't be things like a tie that said male chauvinist pig, but just little ways that women are not included or women are given subsidiary roles. It is always my policy never to be a secretary in an organization because that's what they always ask women to do, so I always

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Mary Gray

CALL FOR NOMINATIONS

The Association for Women in Mathematics Dissertation Prize

In January 2016 the Executive Committee of the Association for Women in Mathematics established the AWM Dissertation Prize, an annual award for up to three outstanding PhD dissertations presented by female mathematical scientists and defended during the 24 months preceding the deliberations for the award. The Prizes will be given for those dissertations deemed most outstanding by the award committee. The award is intended to be based entirely on the dissertation itself, not on other work of the individual.

To be eligible for the award a graduate student must have defended her dissertation within the last two years (October 1, 2014 to September 30, 2016). She must either be a US citizen or have a school address in the US. The Prizes will be presented at the AWM Reception and Awards Presentation at the Joint Mathematics Meetings in Atlanta, GA, January 2017.

The nomination should include: 1) a one to three page letter of nomination highlighting the exceptional mathematical research presented in the dissertation; 2) a curriculum vitae of the candidate not to exceed three pages; 3) a copy of the dissertation and 4) two letters supporting the nomination. Nomination materials should be submitted online at MathPrograms.org. The submission link will be available 45 days prior to the nomination deadline. Nominations must be received by **October 1, 2016**. If you have questions, phone 703-934-0163, email awm@awm-math.org, or visit www.awm-math.org.

want to be the treasurer because I found out that if you are in charge of the money you can get a lot more done. Many things like that keep coming up if you don't keep at it or if you get discouraged.

SG: So was it ever scary for you to speak up in these environments?

MG: Well I know for a fact that because I had a husband [Alfred Gray] who had a job, I was never worried about being out of a job. I don't think it ever occurred to me that I would be fired but I suppose at least subliminally the fact that I wasn't on my own did make a difference.

SG: You basically did everything in those early years of the organization such as typing the early newsletters yourself?

MG: Oh yes.

SG: What was the reaction of the mathematical community to AWM in those beginning years?

MG: Mixed would probably be the best term. There were a lot of women mathematicians more senior than I who had been around a long time, who thought AWM was a bad idea because you shouldn't recognize people for being women mathematicians, and there was no real point for the organization because the mathematical community should recognize merits. They were never openly hostile but were not very supportive. There were senior men who were very supportive and other men who were not. Essentially there were times we heard that a group of men had organized themselves to come and heckle us. We were sort of prepared, but they never opened their mouths. They were apparently intimidated when they arrived. They had never seen so many women mathematicians before, probably.

Then we elicited the aid of Hope Daly. Hope was the meetings organizer for the AMS. She was great about giving us a prominent spot in the exhibitions and arranging rooms for us and doing everything possible that she could for us. So probably she's the most significant person from the establishment, so to speak, that was helping us.

SG: You've mentioned that there were supportive men. Of course that includes Lee Lorch, Chandler Davis, and your husband. What other men were supportive, either behind the scenes or at the forefront?

MG: Bettye Anne Case's husband Jack [Quine] was certainly very helpful. He did a lot of hard work that nobody else wanted to do. Gail Young [Gail S. Young, Jr.] was also extremely helpful. Steve Smale always showed up at everything. He's been supportive of all kinds of causes, including the Black Panthers. Alice Schafer's husband Richard too, although he tried to pretend he wasn't with us. He was very embarrassed because we created a scene or something. And Tom Banchoff. I just saw Tom a half hour ago. John Milnor was another person who was really good. And several of his wives as well. That reminds me of another male mathematician, Neal Koblitz. I'm seeing his wife Ann Koblitz in Seattle, even though she is not a mathematician, because she's written a

CALL FOR NOMINATIONS

The 2018 AWM-Sadosky Research Prize in Analysis

The Executive Committee of the Association for Women in Mathematics has established the AWM-Sadosky Research Prize in Analysis. First presented in 2014, the prize will be awarded every other year. The purpose of the award is to highlight exceptional research in analysis by a woman early in her career. Candidates should be women based at US institutions who are within 10 years of receiving their PhD, or having not yet received tenure, at the nomination deadline.

The AWM-Sadosky Research Prize serves to highlight to the community outstanding contributions by women in the field and to advance the careers of the prize recipients. The award is named for Cora Sadosky, a former president of AWM, and made possible by generous contributions from Cora's husband Daniel J. Goldstein, daughter Cora Sol Goldstein, and friends Judy and Paul S. Green and Concepción Ballester.

The nomination should include: 1) a one to three page letter of nomination highlighting the exceptional contributions of the candidate; 2) a curriculum vitae of the candidate not to exceed three pages and; 3) three letters supporting the nomination (submitted independently). Nomination materials should be submitted online at MathPrograms.org. The submission link will be available 45 days prior to the nomination deadline. Review of candidates will begin in mid-February. For full consideration, nominations should be submitted by **February 15, 2017**. If you have any questions, phone 703-934-0613 or email awm@awm-math.org.

book on Sonia Kovalevskaya. They have a small fund, which gives money for travel and other things to Vietnamese and South American women mathematicians, men too, but in particular women mathematicians.

Impacts of AWM and Why it is Still Needed

SG: Some of those who were vociferous opponents of AWM earlier on eventually attended AWM parties. What were they opposed to, and what was it like when they joined in?

MG: They would show up because that was the only party going on and we had more fun than anybody else and they could come meet people and in the hope of picking up women, obviously. Some of the older men also suddenly discovered that there was a discrimination issue when they had daughters who were ready to start professional careers. We found that in Congress, in lobbying. Those congressmen who had not been helpful at all suddenly became big proponents of most of the legislation that we were pushing when they got to the age when their daughters were graduating from college. Mathematicians were the same. People learn.

SG: Well that's the whole idea of activism. That people can learn and be impacted.

MG: However I will tell you a story which is a myth. People have told it to me and I will repeat it to you with the understanding that it is a myth. Not too long into AWM's career, maybe 10 or 15 years or so, the MAA decided to give an award recognizing the work done for women and the original intention was to give it to me and Alice Schafer. Giving it to me was vetoed by the hierarchy because I was considered too radical. Whereas Alice was safe.

SG: You could take that as a compliment.

MG: That's right. They did give Alice an award.

SG: Have any of the AWM panels been contentious? Are there any recollections that you can share?

MG: Well usually Saunders Mac Lane would show up and make some sort of speech about how, for example, they once hired a woman mathematician at the University of Chicago but her research really wasn't very good and so therefore he couldn't see the point about worrying about women in mathematics. And that story was repeated with variation at more than one AWM meeting.

There were occasionally people who would say you're taking jobs away from husbands who have to support their wives. But you need to remember that when I started out and through a period early on, jobs were easy to get and then when jobs became difficult to get, people were much more protective of themselves. You see the same thing with minorities. A lot of people were supportive as long as African

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CALL FOR NOMINATIONS

The 2018 AWM-Microsoft Research Prize in Algebra and Number Theory

The Executive Committee of the Association for Women in Mathematics has established the AWM-Microsoft Research Prize in Algebra and Number Theory. First presented in 2014, the prize will be awarded every other year. The purpose of the award is to highlight exceptional research in some area of algebra by a woman early in her career. The field will be broadly interpreted to include number theory, cryptography, combinatorics and other applications, as well as more traditional areas of algebra. Candidates should be women, based at US institutions who are within 10 years of receiving their PhD, or having not yet received tenure, at the nomination deadline.

The AWM-Microsoft Research Prize serves to highlight to the community outstanding contributions by women in the field and to advance the careers of the prize recipients. The award is made possible by a generous contribution from Microsoft Research.

The nomination should include: 1) a one to three page letter of nomination highlighting the exceptional contributions of the candidate; 2) a curriculum vitae of the candidate not to exceed three pages and; 3) three letters supporting the nomination (submitted independently). Nomination materials should be submitted online at MathPrograms.org. The submission link will be available 45 days prior to the nomination deadline. Review of candidates will begin in mid-February. For full consideration, nominations should be submitted by **February 15, 2017**. If you have any questions, phone 703-934-0613 or email awm@awm-math.org.

Americans were taking manual labor jobs but not once they wanted to be in academia.

SG: Do you have any regrets about AWM?

MG: The one thing I regret is that we haven't done a better job with minorities. I'm currently on the Advisory Board for AWM. What I urge AWM to try to do is to go in to community colleges, which are a good source for faculty and for students. We ought to be doing more. I've suggested that we should have a visible presence at the regional MAA meetings.

SG: After your presidency, you continued being involved in AWM with activities such as long range planning, legal advisor, and the advisory board. In thinking about almost 45 years of AWM, what has stayed the same and what has changed?

MG: Women are still a minority. When it comes to percentages of PhDs we've gotten that up. But it seems to have hit a plateau. And the only reason it is this high is because we are now counting statistics PhDs in with math PhDs and in statistics the percentage of women is actually in the forties. So we still are not doing as well as we should. With major speakers, the MAA has done very well at getting women in major roles but the AMS doesn't do as well as it should. There is still a long way to go.

The type of discrimination changes. It's not always women. We went through a period where there was a lot of discrimination against gays and lesbians. We now have disability discrimination. I just read an article about two cases at my own university where it's two women who didn't get tenure claiming age discrimination. Neither one of them are mathematicians.

SG: What is your favorite story or anecdote about AWM or its impact?

MG: I like the story about the council meeting, because that's the one that gets repeated the most. More recently if you look at the speakers at any major meeting you see that there are actually women on the program and there are people in leadership positions like Ingrid [Daubechies] as ICM chair. You realize that it is not solely due to AWM, but it's had a huge impact in a time in which jobs and other things were difficult.

SG: In the very first *Newsletter*, in discussing the challenges of being called upon to name great women mathematicians, you wrote: "Young women in mathematics need to be encouraged to think of themselves as potential Fields Medal winners." It took about 43 years after that for Maryam Mirzakhani to be named the first woman to win. This is just one of many barriers that have been broken since AWM's founding. What hopes do you have for AWM, if there is anything you haven't already mentioned to me, or for women in mathematics in general?

MG: Well I'm glad you mentioned the Fields Medal, because one thing, not only have we not done terrifically well with minorities in the United States, we haven't done as much reaching out to developing countries as we might. There is a very healthy mathematical community in Iran involving lots of women other than just one Fields Medal winner, and I'm hoping that when this treaty goes through, and I'm convinced it will, it will help because it will open up things. I've been advised not to go to Iran because of my background with Amnesty. Nonetheless I would love to go to Iran. I think we could do more. Due to our efforts there's a reasonably active woman mathematicians group in England

NSF-AWM Mentoring Travel Grants for Women *(pending funding)*

Mathematics Mentoring Grants. The objective of the NSF-AWM Mathematics Mentoring Travel Grants is to help junior women to develop a long-term working and mentoring relationship with a senior mathematician. This relationship should help the junior mathematician to establish her research program and eventually receive tenure. Each grant funds travel, accommodations, and other required expenses for an untenured woman mathematician to travel to an institute or a department to do research with a specified individual for one month. The applicant's and mentor's research must be in a field which is supported by the Division of Mathematical Sciences of the National Science Foundation.

Selection Procedure. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM. A maximum of $5000 per award will be funded.

Eligibility and Applications. Please see the website (http://www.awm-math.org/travelgrants.html) for details on eligibility and do not hesitate to contact Jennifer Lewis at 703-934-0163, ext. 213 for guidance.

Deadline. There is one award period per year. Applications are due **February 1**.

but not much in other countries, and not much in developing countries. You see this button? This is ¾ of a Euro. And the reason it is ¾ of a Euro is because in the Euro zone women's salaries are three-quarters that of men. So it was given to me by a feminist group in Helsinki in a conference on Émilie du Châtelet where I spoke.

School, Mentoring and Support

SG: I've read that your father challenged you with mental arithmetic when you were young? How old were you and is that how you got interested in math?

MG: Three or four quite probably. He was a high school graduate but no college education, but he was sort of a history buff, so we read together lots of history books, particularly about the Midwest, so I knew more about the history of Nebraska probably than most people who are living there. He got me interested in history and math.

SG: In 2012 you won the COPSS Elizabeth L. Scott Award for mentoring in statistics. Is there someone that mentored you that you would give this award to, if you could?

MG: I went to a very small college as an undergraduate. It was a one, or sometimes a half, person math department. And the first year, when I was a freshman, the guy who was the math department died in the middle of the year and that was very sad. They got me to teach one of the courses even though I was only a freshman. It was what we would now call a remedial course I guess, and then they brought in a new department chair and he was very encouraging. I don't send a lot of money to my undergraduate alma mater, but I always send it in memory of him. He was great.

And then Elizabeth Scott herself. When I switched over and became a statistician after having been a mathematician she was very encouraging. She told me that she had started out being an astronomer and switched over to statistics, and that statistics was really a better field for women than most. And to hang in there.

The statistician who is famous in statistics for mentoring women is the late Ingram Olkin. And Ingram Olkin has certainly helped me along the way by encouraging me to stick with it and work on things that I may not otherwise have worked on.

SG: I've read that derogatory comments spurred you on to work even harder. Some people would have been very discouraged and perhaps given up.

MG: One example is from my first year in graduate school, in my topology class, as I was going out the door. The guy who taught it said, "I don't understand how come

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CALL FOR NOMINATIONS

The 2018 Noether Lecture

AWM established the Emmy Noether Lectures in 1980 to honor women who have made fundamental and sustained contributions to the mathematical sciences. In April 2013 the lecture was renamed the AWM-AMS Noether Lecture and since 2015 has been jointly sponsored by AWM and AMS. This one-hour expository lecture is presented at the Joint Mathematics Meetings each January. Emmy Noether was one of the great mathematicians of her time, someone who worked and struggled for what she loved and believed in. Her life and work remain a tremendous inspiration.

The mathematicians who have given the Noether lectures in the past are: Jessie MacWilliams, Olga Taussky Todd, Julia Robinson, Cathleen Morawetz, Mary Ellen Rudin, Jane Cronin Scanlon, Yvonne Choquet-Bruhat, Joan Birman, Karen Uhlenbeck, Mary Wheeler, Bhama Srinivasan, Alexandra Bellow, Nancy Kopell, Linda Keen, Lesley Sibner, Ol'ga Ladyzhenskaya, Judith Sally, Olga Oleinik, Linda Rothschild, Dusa McDuff, Krystyna Kuperberg, Margaret Wright, Sun-Yung Alice Chang, Lenore Blum, Jean Taylor, Svetlana Katok, Lai-Sang Young, Ingrid Daubechies, Karen Vogtmann, Audrey Terras, Fan Chung Graham, Carolyn Gordon, Susan Montgomery, Barbara Keyfitz, Raman Parimala, Georgia Benkart, Wen-Ching Winnie Li and Karen E. Smith. Lisa Jeffrey will deliver the 2017 lecture.

The letter of nomination should include a one-page outline of the nominee's contribution to mathematics, giving four of her most important papers and other relevant information. Nominations are to be submitted as ONE PDF file via MathPrograms.Org. The submission link will be available 45 days prior to the deadline. Nominations must be submitted by **October 15, 2016** and will be held active for three years. If you have questions, phone 703-934-0163 or email awm@awm-math.org.

you're here with a National Science Foundation Fellowship—you know some men could have this." Well I determined that I was going to get an A in topology, even though I didn't have a very good background. I came from a small college and did very well there, but I didn't have a lot of courses. I got the highest grade in the topology class and did well in all my other subjects, and I think I worked particularly hard because he was such a jerk.

SG: Any other comments about your school experiences?

MG: Only peripherally related to math. But being an activist and getting involved is part of AWM as well. When I was an undergraduate I had a full tuition scholarship but I didn't have a lot of other money, so I had a lot of part time jobs. One of the jobs was essentially as a secretary in the registrar's office. The registrar at this small college was very encouraging and she encouraged me to apply for a Fulbright, even though I came from a not very well known college. She pointed out that since I had taken German one summer in my undergraduate days I had the language skills and not very many people with science backgrounds apply for a Fulbright, and that's still the case, as a matter of fact. So she encouraged me to think that I would have a good chance. So along with applying for the NSF I applied for a Fulbright to go to Germany for a year. I traveled all over Western Europe and a little bit in eastern Europe, and that just made me interested in doing all kinds of things from then on. So that was an important experience as well.

SG: You actually began your activist work years before AWM?

MG: I was involved a bit in civil rights as a graduate student in the early '60s. I was also involved in the anti-war movement from about 1966.

SG: Did you have support from the people around you for AWM? You were associate professor but not yet full professor. So how about your department and your husband?

MG: The department basically let me do what I wanted to do. So I never had a problem until fairly recently when we got a dean who was unappreciative of people who spoke out when they didn't like what deans did. That kept me from getting as big a raise as was possible. That's just one fairly minor thing. I think I was always treated fairly well.

My husband was basically supportive in the sense of helping out when it was needed but also not doing anything to keep me from doing what I wanted to do. For instance, when we reproduced the newsletter he went to the University of Maryland and got them to run it off. They were grateful to him because he had helped them with discrimination on the Maryland campus. It had to do with research assistants who, at the time, were called lab assistants. They were paid more than the research assistants in the math department who were called administrative assistants. This was back in the days when a lot of people had to have typing help and reproducing help. These were the people who supported the research of mathematicians. So he got them reclassified as research assistants and got their salaries raised. They probably would have helped us anyway, but he built up some good will that way.

I do have one story that I tell about my husband's support. I went to Nicaragua the first time the Sandinistas were in power. The university in León had an agreement with Yale and the idea was they could call on Yale faculty to help them. A friend of mine from Yale, who I'd previously worked with on human rights, called me up to ask if I would go to Nicaragua and help on a project. So we went and then on the way back, we were going to stop in Havana at a Cuban math conference and give talks. At that time it was illegal to go to Cuba, so that is a whole different story, but when we were ready to leave Nicaragua for Cuba our flight was cancelled and there wasn't going to be another one for four days. There was a flight that was going to stop in Havana to pick up passengers and go on to Moscow, even though it didn't have any rights to land passengers. So we persuaded the minister of education in Nicaragua to let us get on that flight (with the understanding that we might not be able to get off in Havana). I actually would have been happy to go on to Moscow, because my husband happened to be at a conference there. And I had said to him since I was going to be in Havana anyways why don't I just fly on to Moscow. And he said don't you dare come to Moscow because then everyone is going to talk about mathematics in Cuba and nobody is going to pay attention to differential geometry. So I didn't plan on going but I would have been pleased had I ended up there anyway. That's the only time I can think of when he really was not totally supportive. Well he was supportive of what I did as long as it didn't interfere with what he was doing.

Helping Others—Taking Equal Responsibility

SG: What do you most enjoy about your professional activities?

MG: Finding different ways to help different kinds of people. I'm currently working on a project to survey refugees with an organization called HelpAge that is concerned about the treatment of refugees who are old, namely 50 or more, which is old for a refugee. So we are trying to get some

surveying done in various countries. We got thrown out of Kyrgyzstan. We are working on a project in Jordan and we may be able to work in South Sudan. But if it's not that then it is something else that conceivably is going to have some impact.

SG: You've taken part in a variety of activities throughout your career. What do you consider the most memorable?

MG: I think it was winning against TIAA-CREF.

SG: And I thank you for that!

MG: The pension equity came about when I got a pension statement from TIAA-CREF. If you have so many hundred thousand dollars per year in your account when you retire, your monthly benefit is such and such. And they had two columns, one headed women and one headed men. And the men one was 15% higher than the women one. And this was after Title VII became applicable to college professors. In '64 when it passed, professionals were not covered by Title VII, but in 1972 they became covered. So this was after 1972. So I called up TIAA-CREF and said, "So you have to change your tables now because you can't get away with this anymore." They said "No, you don't understand. This is not on the basis of sex. This is on the basis of longevity and women live longer than men." So I said "So you're going to guarantee me that I'm going to live longer than all of my male colleagues?" They said, "Oh no, you just don't understand statistics." That did not sit well. So then I found out that a very well-known woman attorney who had done a lot of important work in gender discrimination was heading up the Department of Labor's lawsuit against TIAA, with respect to another university but with the same plan. So I worked with her on some of the statistical background, showing, for example, that a lot of the mortality difference between men and women was due to drinking and smoking, not genetics.

We got into a settlement conference. I went to court with Ruth (that was the attorney), who was very small, a much older woman, and there were eleven attorneys for the university and TIAA-CREF. So we were in the settlement conference, and one of the attorneys said "well maybe you understand statistics, but you just don't understand the law." So that's when I decided to go to law school, and then I could write a brief when the case got to the Supreme Court. So that was great. And I'm very glad I did that.

SG: What led you to work on human rights issues? Can you tell us about that?

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CALL FOR NOMINATIONS

The 2017 Kovalevsky Lecture

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

The mathematicians who have given the prize lecture in the past are: Linda R. Petzold, Joyce R. McLaughlin, Ingrid Daubechies, Irene Fonseca, Lai-Sang Young, Dianne P. O'Leary, Andrea Bertozzi, Suzanne Lenhart, Susanne C. Brenner, Barbara Keyfitz, Margaret Cheney, Irene M. Gamba, Linda J.S. Allen, and Lisa Fauci.

The lectureship may be awarded to anyone in the scientific or engineering community whose work highlights the achievements of women in applied or computational mathematics. The nomination must be accompanied by a written justification and a citation of about 100 words that may be read when introducing the speaker. Nominations are to be submitted as ONE PDF file via MathPrograms.Org. The submission link will be available 45 days prior to the deadline. Nominations must be received by **November 1, 2016** and will be kept active for two years.

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

MG: The human rights work arose from work with the AMS because there was a mathematician, José Luis Massera, a Uruguayan mathematician, who had been arrested and thrown in jail when the colonels took over Uruguay. By the time I got involved he had been in prison for ten or twelve years and he was not in good health. The mathematical community, at an ICM, decided to send a delegation to Uruguay, representing the American Mathematical Society, the French mathematical society, the Brazilians and the Mexicans. The president of the AMS refused to get involved with peripheral things like human rights of mathematicians, and so he said, "Since you are vice president, you can go." I was like, "Great!" so that's how I got involved in human rights and it grew from there, and we got him out of prison. We got other mathematicians out of prison too.

SG: What advice do you have for us?

MG: There may be a thousand cuts, like I said earlier, but you just have to keep going. They're unlikely to be fatal if you keep at it. Expanding the message is important too as I don't think we've done as well as we've might. I am in firm belief that we need more women as department chairs. Because ultimately that has a big influence on the students and on the junior faculty, in making clear to the junior faculty what is important. It is important that you go to the meetings. It is important that you start publishing. It is important that you do whatever your school wants you to do, but to me it is the department chair's responsibility to make that clear. Other people think other colleagues can do it and I do a lot of it even when I am not chair. I have been chair on and off many times over the years. Too many women don't want to take on the responsibility. And it's understandable, particularly for people who have small kids. On the other hand, you know you can't demand equal rights if you don't take equal responsibility.

Further Readings:

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Fasanelli, Florence. "Mary Gray." Notable Women in Mathematics: A Biographical Dictionary, edited by Charlene Morrow and Teri Perl. Greenwood Press, 1998, pp. 71–75.

Gray, Mary. "The Association for Women in Mathematics—A Personal View." The Mathematical Intelligencer 13(4), 1991, pp. 6–11.

Gray, Mary. "How Bad Were the 'Good Old Days'?" AWM Newsletter 36(3) May–June 2006, pp. 12–13. http://www.drivehq.com/folder/p8755087/1751134459.aspx

Kenschaft, Patricia Clark. "Reawakening: The Association for Women in Mathematics." Change is Possible: Stories of Women and Minorities in Mathematics. American Mathematical Society, 2005, pp. 131–150.

NSF-AWM Travel Grants for Women *(pending funding)*

Mathematics Travel Grants. The objective of the NSF-AWM Travel Grants is to enable women mathematicians to attend conferences in their fields, which 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.

Selection Procedure. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM. A maximum of $2300 for domestic travel and of $3500 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. Please see the website (http://www.awm-math.org/travelgrants.html) for details on eligibility 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**.

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.

Choices on *Chicago Med*

Sarah J. Greenwald, Appalachian State University

Chicago Med is a hospital drama focused on an emergency room in Chicago. In "Choices" (original airdate 2/9/16) one of the patients, Olivia Gray, is introduced as a mathematics professor. Gray is found unconscious at her desk at work. She wakes up in a full blown manic episode, yelling about needing the numbers that are trying to escape. It turns out that she had been diagnosed with bipolar disorder. They refer to her as Professor Gray, indicating respect for her position, although I don't think I've ever been to a doctor who called me professor before.

The next time we see her, she and Dr. Charles, the staff psychiatrist, are having a jovial conversation:

> Professor Gray: That's why I love fractals. The perfect union of math and art.
>
> Dr. Charles: Well, the Art Institute would certainly agree. Did you see the Mandelbrot exhibit?
>
> Professor Gray: Hello! He's the only reason I studied Brownian motion. Who wants to see another iteration of finite subdivisions?
>
> Dr. Charles: Not me, baby.

This is a minor subplot in an hour-long episode that has a number of plots with other patients and doctors (http://www.nbc.com/chicago-med/video/choices/2979790). If the writers chose mathematician as her career because of the stereotypes of mathematicians and mental illness in popular culture, I wasn't able to tell. I enjoyed the diversity of the character and the mathematical interplay. The way she is written and portrayed, Gray, who is Asian, could have just as easily been from another culture. She could have been written as a male mathematician or even a person with a different career. I like seeing mathematicians on television who just happen to be women.

AMC

Registration is now open for the Mathematical Association of America's American Mathematics Competitions, the country's longest-running and most prestigious mathematics competition!

AMC 8 Competition Date: Tuesday, November 15, 2016
AMC 10/12 Competition Dates: Tuesday, February 7, 2017; Wednesday, February 15, 2017

Teachers who register gain recognition for student progress and mathematical skills from their local communities. Sign up for the MAA's AMC program and receive fun and challenging problems that augment your curriculum and engage your students in a fun competition. Join the thousands of teachers and schools across the country who administer this competition, and sign up today. Register online to receive a $10 discount! To register, visit amc-reg.maa.org. Use code AWMP when signing up.

BOOK REVIEW

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

Unspinning the Spin: The Women's Media Center Guide to Fair and Accurate Language, by Rosalie Maggio. WMC Press, 2015. Print copy available from Women's Media Center, eBook available from online booksellers.

Reviewer: Marge Bayer

The Women's Media Center identifies this as the first publication of the WMC Press. It opens with a Preface by Robin Morgan and Gloria Steinem. It is in part aimed at those who write for various media, but it is of interest to anyone who thinks about how language affects people's attitudes towards gender and, concomitantly, race, ethnicity, religion, disability, etc. After the preface is an Introduction that delves into issues of the effects of language, guidelines for using inclusive language, some problems that arise in special contexts and suggested responses to arguments against "changing the language." The remainder of the book is a long Glossary of entries in alphabetical order.

One comment about format. The book is readily available in electronic formats, and that is how I read it. I wish I had gotten a paper copy (available directly from the Women's Media Center); it would have made it much easier (at least for those of us less electronically inclined) to browse the Glossary.

"The process of looking at our language, discussing it, and debating it increases our awareness of the social inequities and of the truths reflected by our word choices." (from the Introduction) The author points out that even language that does not contain any biased words can be biased. She gives the example of instructions that say, "Anyone can use this fire safety ladder," written without acknowledging those who in fact cannot use a fire safety ladder. Language traps include identifying a person's gender, race, or other group characteristic when it is irrelevant, using labels that people do not choose for themselves (called exonyms), and assuming stereotypical behavior applies to all members of a group. In fact, of course, none of the categories we try to put people in are well-defined with rigid boundaries. I am reminded of the phrase Ta-Nehisi Coates uses in *Between the World and Me*: "people who believe that they are white." We certainly are more conscious now of multiplicity of gender and race. This year, when a University of Kansas debate team placed second in the National Debate Tournament, the university news release described them as "only the second team of two non-males to debate in the final round." On the other hand, when the local television station interviewed them, the host of *The Not So Late Show* addressed them as "Ladies."

There is a distinction between a generic term (such as worker or student) and a "pseudogeneric" term, one that purports to apply to all genders, but is biased towards males. While many argue that the use of "man" or "he" is to be understood as applying to all people, studies show that the image evoked is that of a male. And as young children are learning language, they will not grasp the subtlety of the use of "he," sometimes to mean a male, and sometimes to mean a person of any gender. The cumulative effect of hearing the references to males over our lifetimes leads us to make subconscious associations of professions and other roles with males. This happens even when we consciously fight against it. The Minnesota legislature voted (in 1984!) to remove gender-specific language from state statutes. About 20,000 changes needed to be made, including 301 words specific to females.

The part of the introduction I found most interesting was the last part, with a tongue-in-cheek title, "How to make a fortune with fair and accurate language." It presents arguments against changes in language and responses to those arguments. The author certainly takes the position that language belongs to all of us and that it changes as people adopt new words and constructions, not as the dictionary-writers dictate.

Some argue that those who want inclusive speech are taking away freedom of speech. This is disingenuous, given that all sorts of media and organizations have restrictions on language, based on appropriate context or on avoidance of incitement or harassment.

Some argue that there are much more important things to worry about than language. The author argues convincingly that language affects how we think and act. Before the term "sexual harassment," sexual harassment existed. But legal and social responses to sexual harassment became much easier after the terminology became common. Those working in political campaigns certainly know the value of words, choosing one set to use for their own candidate and another to apply to their opponent. Words matter.

Some people are simply conservatives when it comes to changing language. The author gives a couple of examples of inclusive language that was used long ago, and was later replaced by gender-biased language: firefighter replaced by fireman, chair replaced by chairman. She gives examples of historical terms that people have used to describe themselves that should replace exonyms ("Rom" in place of "Gypsy," "Inuit" in place of "Eskimo").

Some complain that it is too difficult to be careful about their language. The author points out that many who say they cannot remember the terms they should use have no

trouble remembering the esoterica of professional sports or popular music.

When biased language is pointed out to people, they sometimes complain that people are too sensitive. This position is carried to extremes by those who ridicule "political correctness." *The New York Times Magazine* has a column called "First Words." While I was writing this review, the column dealt with political correctness. I wished they had included the Robin Morgan quote that Maggio gives: "P.C. doesn't stand for Political Correctness, it stands for Plain Courtesy."

Here are some guidelines for nonbiased writing from the book.

Active instead of passive constructions. The point here is that women (and people of "minority" backgrounds) are often described as having things happen to them, rather than being active participants. In addition, when mistreatment or abuse of women is described using the passive voice, it downplays the role of the perpetrator.

Be aware of different connotations for mostly synonymous adjectives, as they have been used for different genders or population groups: firm versus obstinate, cautious versus timid.

Letter salutations. Instead of "Dear Sir" or "Dear Madam," use "To the Manager" or "To the Committee Member."

People first rule. A person is a person first; their group membership or disability is secondary. Refer to a "person with diabetes" rather than a "diabetic."

Use of they in the singular. The author endorses this, but recommends alternative constructions to avoid it. A sentence using the pseudogeneric third person singular masculine pronoun can perhaps be rephrased using the second person or the plural, or with the generic "one." This is fine when writing, but in speech, we are more likely to use "they" than to figure out how to reword a sentence to avoid the need for "they."

The author recommends against using "person" to replace "man" in compound nouns, except in the word "personhood." For those of us at colleges and universities, the word "freshman" poses special difficulties. "Freshperson" is certainly stilted. "First-year student" and "frosh" seem to be the preferred replacements. When I was in college in the 1970s we favored the term "freshfolk."

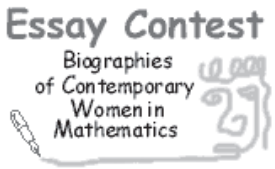
As pointed out by the author, when one thinks carefully about how to write in a nonbiased way, one is likely to be more thoughtful in general about writing and to improve the writing style in general.

Many of the entries in the Glossary are words that explicitly or implicitly carry bias. The entries explain the biased connotation and suggest alternatives. This is what I expected in the Glossary. But many entries have little to do with the use of language, and instead discuss a political issue affecting women. The first example of this is the entry for "abortion." It is a longer discussion of political and legal issues surrounding abortion, with some statistics on incidence and deaths. Even when the entry mentions "partial birth abortion" it does not go into how that language influences the debate. In fact, for some terms in the Glossary (for example, Bangalore) I could find no connection to the subject of the book.

I was curious about the word "human," which contains the word "man," but is often the word of choice for the author. The entry for human in the book says that it comes from the Latin "humanus," meaning "ground." The Online Etymology Dictionary explains that the word was used to distinguish earthlings from the gods. Similarly, the word "person," while including the word "son," does not have a gender-specific origin.

The author has unearthed some wonderful quotes. The Glossary starts each letter section with a couple. I will end the review with one of my favorites from the Introduction.

> Marlo Thomas: "A man has to be Joe McCarthy to be called ruthless. All a woman has to do is to put you on hold."



To increase awareness of women's ongoing contributions to the mathematical sciences, the Association for Women in Mathematics holds an annual essay contest for biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers. AWM is pleased to announce that the 2017 contest is sponsored by Math for America, www.mathforamerica.org.

The essays will be based primarily on an interview with a woman currently working in a mathematical career. The AWM Essay Contest is open to students in the following categories: grades 6–8, grades 9–12, and undergraduate. At least one winning entry will be chosen from each category. Winners will receive a prize, and their essays will be published online at the AWM website. Additionally, a grand prize winner will have his or her entry published in the *AWM Newsletter*. For more information, contact Dr. Heather Lewis (the contest organizer) at hlewis5@naz.edu or see the contest web page: www.awm-math.org/biographies/contest.html. The deadline for electronic receipt of entries is **January 31, 2017**. (To volunteer as an interview subject, contact Heather Lewis at the email address given.)

EDUCATION COLUMN

Education Column Editor: Jackie Dewar, Loyola Marymount University, jdewar@lmu.edu.

Developing a Mathematical Urge and Mind

Pat Kenschaft, Professor Emerita of Mathematics, Montclair State University

I suspect that most AWM readers agree with me that math is not learned primarily from paying attention to teachers and books and then doing endless exercises but from playing with ideas and letting them wander in one's mind. The latter approach requires leisure. Alas, our current culture seems to be trying to deprive children and their parents of free time.

Eleven years ago the book *Last Child in the Woods: Saving Our Children From Nature-Deficit Disorder*[1] expounded on the emotional and intellectual troubles that result if children and others do not have frequent leisurely communion with nature. Two recent films expand on this idea and extend it.

Love Thy Nature[2] advocates a lunch break in nature for all children and praises edible schoolyards. For many, nature is a sacred place that is basic in a child's development. Playing with other children in nature is also important for their socialization. "Kids learn better when they are having fun."

In his 2016 documentary *Where to Invade Next?*[3] Michael Moore travels from one foreign country to another, describing through fascinating interviews how other nations handle some aspect of public policy in a very different way than the United States. At the end he claims that these were all US innovations, but others have taken our ideas and run with them more effectively than we have … yet. He argues that if others can, surely we can too. One of these innovations in our country was free education for all.

This film begins with public education in Finland, whose students score much higher than US students on international tests. Moore is shocked to discover that there is a no-homework policy. He interviews youngsters of various ages. The children all say they are never assigned homework, but the teenagers confess to doing up to ten minutes of "homework" yesterday. Apparently, they enjoy doing some self-assigned school work at home.

Then he talks with adults about the length of the school day in their town. One claims that children in her town have twenty hours of schooling a week. We get the impression more may be required for teenagers, but nothing comparable to the expectations for US youngsters.

Moore interviews a principal who says her primary goal is to make her charges happy.

"Happy!" responds Moore incredulously.

"Yes, because then they will learn much better."

There are no multiple choice tests in Finland except the international PISA tests. He asks students what they put down on test papers if they aren't given choices of answers.

"Just the right answer," responds one boy a bit derisively.

In France, Moore goes to a school lunch program. He is amazed at the quality of the food, which he says is worthy of a fine French restaurant. He is startled to see the children seated around tables, but more startled when they are served a four-course lunch: an appetizer, a cheese course, a main course and a dessert. The children seem to enjoy it and the adults say it develops their social skills and good nutrition helps them learn better.

Back in Finland we see a scene with a woman teaching a class of pre-teen girls and boys. "You will always remember your first sexual experience, so it's important to make it a good experience. Be sure to choose someone you care about and will be kind to." Then she asks them for the contraceptives that they know, and the children are remarkably knowledgeable. She makes sure they all know the answers by the end.

Michael Moore comments afterward how different this is from American customs, and he is told that Finland has a far lower teenage pregnancy rate than the United States. One can wonder if this is appropriate for a review in the *AWM Newsletter*, but avoiding pregnancy until a woman wants a baby is good for mathematical thriving. The film *Where to Invade Next?* has many informative and thought-provoking topics, not just about education. It's funny too, and I highly recommend people see it.

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[1] In this 2005 book published by Algonquin Books, Richard Louv documented decreased exposure of children to nature in American society and how this "nature-deficit disorder" harms children and society. (Source: Wikipedia)

[2] This award-winning documentary film (2014) directed by Sylvie Rokab and narrated by Liam Neeson received a theatrical release in the United States on April 22, 2016 (Earth day). (Source: Wikipedia)

[3] This documentary film written and directed by Michael Moore in the style of a travelogue was released very briefly in December 2015, in New York and Los Angeles, in order to qualify for the 88th Academy Awards. It re-opened more widely on February 12, 2016. (Source: Wikipedia)

Finland has no standardized tests except the international tests. The use of standardized testing is controversial, so I devoted my entire column two years ago to "Why I Oppose Standardized Testing."[4] The international tests are standardized, but the poor US showing suggests that our overemphasis on them does not help our youngsters' performance on them. I believe there are many more valuable goals for our public schools, including imparting knowledge, stimulating creative thought and sociability, and enhancing our children's health and happiness. All of these seem vastly more essential to me for preparing children to participate in a healthy democracy than test preparation and taking—and rigid discipline more generally. Let's let our children go out and play!

[4] *AWM Newsletter*, September–October 2014, Volume 44, Issue 5, pp. 14–16.

Update from the IMU's Committee for Women in Mathematics (CWM)

Marie-Francoise Roy and Caroline Series, CWM Chair and Vice-Chair, June 2016

A similar article first appeared as an editorial in the July edition of the IMU's electronic newsletter IMU-net www.mathunion.org/imu-net. *To sign up to receive these newsletters, go to the web page.*

The Committee for Women in Mathematics (CWM) of the International Mathematical Union (IMU) was created by the IMU Executive Committee in March 2015 and held its first meeting in the beautiful location of Cortona, Italy last September. We have ten committee members, at least one from each continent, and it was very exciting to meet in person and make plans. For the full list of members see our website http://www.mathunion.org/cwm/home/about/

Between now and Rio 2018, CWM aims to help establishing worldwide networks of female mathematicians at the large scale—i.e., continental—level. IMU funding enabled us to launch a call for proposals with these aims, to which we received nearly 50 responses. We chose to fund seven groups whose key focus was to set up multi-national, non-subject-specific, networks. Events are taking place throughout 2016 from Columbia to Kazakhstan and from Bali to Senegal. A full list can be found at http://www.mathunion.org/events/cwm-sponsored-events/

CWM's aim is to complement rather than supplant other organizations for women mathematicians, such as the Association for Women in Mathematics (AWM) in the USA, European Women in Mathematics (EWM) in Europe, and the many other national groups and committees already in existence. The international meetings for women mathematicians which were held immediately before the ICM in both Hyderabad and Seoul were collaboratively organized by local and international committees and were important precursors to CWM.

CWM's call and funding has furthered the formation of organizations in Central Asia, India, Indonesia and East Asia, and Latin America. African Women in Maths Association (AWMA) predates CWM, having been founded in 2013 in South Africa. CWM has helped to fund the AWMA website and meetings in Kenya, Senegal and Tunisia.

Besides lending its support to several Latin American initiatives, CWM is also planning an international meeting $(WM)^2$: World Meeting for Women in Mathematics. This meeting, with a strong Latin American focus, will be held in Rio just before the ICM.

CWM's website http://www.mathunion.org/cwm is central to our work. It lists an impressive number of events in 2015–16 in all parts of the world. In addition, we have currently 24 countries listed with some form of group or activities. For countries without a formal organization, we post basic contact details according to circumstance, providing a means for women in a given region to contact each other and giving them greater visibility. The site has a unique function as the only platform for coordinating so much diverse worldwide activity.

CWM very much appreciates being informed of material suitable for inclusion on the website, which should be sent to info-for-cwm@mathunion.org.

Editors' note: The CWM website is well worth a visit. See, for example, http://www.mathunion.org/people/biographies/, which includes links and a few biographical paragraphs. A sample begins with: Mary Somerville was a renowned Scottish mathematician and scientist. Self taught, her name was established by her translation and commentary on Laplace's Méchanique Céleste. Her scientific contributions were doubly significant: not only was she a woman working within a predominantly male domain, but modern science itself was a fledgling field struggling to claim a place in Victorian culture.…

AWM Thank-yous

AWM is very grateful to those whose donations support its mission of encouraging women and girls to study mathematics and have careers in the mathematical sciences. We extend a special thank you to AWM contributing members and donors. We also thank those who prefer to remain anonymous. (This list reflects individual donations made July 1, 2015 – June 30, 2016.)

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AWM WORKSHOP AT THE 2017 SIAM ANNUAL MEETING

Application deadline for graduate students: November 1, 2016

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. Beginning in 2016 and going forward, the workshop talks will be supported by the AWM ADVANCE grant. The AWM Workshops serve as follow-up workshops to Research Collaboration Conferences for Women, featuring both junior and senior women speakers from one of the Research Networks supported by the ADVANCE grant. An AWM Workshop is scheduled to be held in conjunction with the 2017 SIAM Annual Meeting in Pittsburgh, Pennsylvania, July 10–14, 2017.

FORMAT: The workshop will consist of two research minisymposia focused on Numerical Analysis and Scientific Computing organized by Susanne Brenner, Fengyan Li and Beatrice Riviere, a Poster Session and an informational minisymposium directed at starting a career. Selected junior and senior women from the Research Collaboration Conference for Women (RCCW) WhAM!2 will be invited to give 20-minutes talks in the two research minisymposia on Numerical Analysis and Scientific Computing. The speakers will be supported by the National Science Foundation AWM ADVANCE grant: Career Advancement for Women through Research Focused Networks. The Poster Session will be open to *all* areas of research, and graduate students working in numerical analysis and scientific computing are especially encouraged to apply. The graduate students will be selected through an application process to present posters at the Workshop Poster Session run in conjunction with the SIAM Poster Session. With funding from NSF, AWM will offer partial support for travel and hotel accommodations for the selected graduate students. The workshop will include a luncheon and mentoring session where workshop participants will have the opportunity to meet with other women mathematicians at all stages of their careers. In particular graduate students in numerical analysis and scientific computing will have the opportunity to connect with the Women in Numerical Analysis and Scientific Computing (WINASc) Research Network.

All mathematicians (female and male) are invited to attend the talks, career panel and poster presentations. Departments are urged to help graduate students and junior faculty 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, in particular the graduate students. If you are interested in volunteering, please contact the AWM office at awm@awm-math.org by **February 1, 2017**.

ELIGIBILITY: To be eligible for selection and funding, a graduate student must have made substantial progress towards her thesis. Women with grants or other sources of support are welcome to apply. All non-US citizens must have a current US address.

All applications for the poster session should include:

- a title of the proposed poster
- an abstract (75 words or less) of the proposed poster
- a curriculum vitae
- a letter of recommendation from her thesis advisor.

Applications must be completed electronically by **November 1, 2016**. See http://www.awm-math.org/workshops.html for details.

2016–2017 Rates: Institutions

Institutional Dues Schedule

Category 1 ..... $325
Category 2 ..... $325
Category 3 ..... $200

Categories 1 and 3 now include 15 free student memberships.

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

CALL FOR NOMINATIONS

Alice T. Schafer Mathematics Prize

The Executive Committee of the Association for Women in Mathematics calls for nominations for the Alice T. Schafer Mathematics Prize to be awarded to an undergraduate woman for excellence in mathematics. All members of the mathematical community are invited to submit nominations for the Prize. The nominee may be at any level in her undergraduate career, but must be an undergraduate as of October 1, 2016. She must either be a US citizen or have a school address in the US. The Prize will be awarded at the AWM Reception and Awards Presentation at the January 2017 Joint Mathematics Meetings in Atlanta, GA.

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

With the letter of nomination, please include a copy of transcripts and indicate undergraduate level. Any additional supporting materials (e.g., reports from summer work using math, copies of talks, recommendation letters from professors, colleagues, etc.) should be enclosed with the nomination. All nomination material is to be submitted as ONE PDF file via MathPrograms.org with a copy of transcripts included at the end of the file. The submission link will be available 45 days prior to the deadline. Nominations must be received by **October 1, 2016**. If you have questions, phone 703-934-0163, email awm@awm-math.org, or visit www.awm-math.org.

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ASSISTANT PROFESSOR, MATHEMATICS — AMHERST COLLEGE

Amherst College has a tenure-track position in mathematics at the rank of assistant professor. We seek applicants who can teach and encourage students of diverse backgrounds, including first-generation college students, international students, and students with varying mathematical preparation. Amherst College is an equal opportunity employer and encourages women, persons of color, and persons with disabilities to apply. The college is committed to enriching its educational experience and its culture through the diversity of its faculty, administration, and staff. Responsibilities include teaching two courses per semester and supervising undergraduate theses. Requirements: Ph.D. in mathematics or a related field, strong commitment to research, passion for teaching. Submit cover letter, curriculum vitae, list of publications, research statement, teaching statement, and at least three letters of recommendation, including at least one specifically addressing teaching, to MathJobs.Org. Applications accepted until the position is filled; those received by **December 1, 2016**, will be guaranteed consideration.

BENTLEY UNIVERSITY—A business-oriented university in suburban Boston, has two open-rank, tenure-track positions beginning fall 2017 in applied fields related to our business orientation. The Mathematical Sciences Department offers undergraduate degrees in mathematical sciences and actuarial science and an MS in business analytics, and it is active in the PhD program in Business. We value interdisciplinary research and collaboration with faculty in other disciplines. For further details and application process see http://jobs.bentley.edu/postings/2070.

BRANDEIS UNIVERSITY—Department of Mathematics invites applications for a 3-year postdoctoral position beginning fall 2017. The teaching commitment is three semester courses per year. Candidates must have a Ph.D., demonstrate potential for excellence in research, and display a commitment to undergraduate and graduate teaching. Candidates in all areas of mathematics will be considered. Brandeis recognizes that diversity in its student body, staff and faculty is important to its primary mission of providing a quality education. The search committee is therefore particularly interested in candidates who, through their research, teaching and/or service experiences, will increase Brandeis' reputation for academic excellence and better prepare its students for a pluralistic society. Applications should include an AMS coversheet, a curriculum vitae, and four letters of recommendation, one of which addresses teaching effectiveness. Applications should be submitted through MathJobs.org. First consideration will be given to applications received by December 1, 2016.Brandeis University is an equal opportunity employer, committed to building a culturally diverse intellectual community, and strongly encourages applications from women and minority candidates.

BROWN UNIVERSITY—Mathematics Department—J. D. Tamarkin Assistant Professorships: One or more three-year non-tenured non-renewable appointments, beginning July 1, 2017. The teaching load is one course one semester, and two courses the other semester and consists of courses of more than routine interest. Candidates are required to have received a Ph.D. degree or equivalent by the start of their appointment, and they may have up to three years of prior academic and/or postdoctoral research experience. Applicants should have strong research potential and a commitment to teaching. Field of research should be consonant with the current research interests of the department. For full consideration, applicants must submit a curriculum vitæ, an AMS Standard Cover Sheet and three letters of recommendation by **December 1, 2016**. Applicants are encouraged to identify Brown faculty with similar research interests. Please submit all application materials on line at http://www.mathjobs.org. Email inquiries should be addressed to juniorsearch@math.brown.edu. Brown University is committed to fostering a diverse and inclusive academic global community; as an EEO/AA employer, Brown considers applicants for employment without regard to, and does not discriminate on the basis of, gender, race, protected veteran status, disability, or any other legally protected status.

CARLETON COLLEGE DEPARTMENT OF MATHEMATICS AND STATISTICS—anticipates hiring for a tenure-track position in Statistics at the Assistant Professor level, to begin September 1, 2017. A PhD in Statistics or Applied Probability in hand or its imminent completion is required. Appointment at a higher level may be considered in exceptional cases. Please see the full advertisement and apply through jobs.carleton.edu/postings/2828. Review of application materials will begin December 1, 2016. Preliminary interviews with available candidates will be held at the Joint Statistical Meetings in Chicago. For information about the department, visit the Carleton Mathematics and Statistics website at http://math.carleton.edu. Carleton College does not discriminate on the basis of race, color, creed, ethnicity, religion, sex, national origin, marital status, veteran status, actual or perceived sexual orientation, gender identity and expression, status with regard to public assistance, disability, or age in providing employment or access to its educational facilities and activities. We are committed to developing our faculty to better reflect the diversity of our student body and American society. Women and members of minority groups are strongly encouraged to apply.

CORNELL UNIVERSITY—The Department of Mathematics at Cornell University invites applications for one tenure-track Assistant, Associate or Full Professor position, starting July 1, 2017. While we particularly invite applications in logic, topology and analysis, candidates from all areas will be considered. Diversity and Inclusion are a part of Cornell University's heritage. We're an employer and educator recognized for valuing AA/EEO, Protected Veterans, and Individuals with Disabilities. We actively encourage applications of women, persons of color, and persons with disabilities. Applicants must apply electronically at http://www.mathjobs.org. For information about our positions and application instructions, see: http://www.math.cornell.edu/Positions/positions.html. Applicants will be automatically considered for all eligible positions. Deadline **November 1, 2016**. Early applications will be regarded favorably.

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CORNELL UNIVERSITY—The Department of Mathematics at Cornell University invites applications for at least one H.C. Wang Assistant Professor, non-tenure track, non-renewable, 3-year position beginning July 1, 2017. Successful candidates are expected to pursue independent research at Cornell and teach three courses per year. A Ph.D. in mathematics is required. Diversity and Inclusion are a part of Cornell University's heritage. We're an employer and educator recognized for valuing AA/EEO, Protected Veterans, and Individuals with Disabilities. We actively encourage applications of women, persons of color, and persons with disabilities. Applicants must apply electronically at http://www.mathjobs.org. For information about our positions and application instructions, see: http://www.math.cornell.edu/Positions/positions.html. Applicants will be automatically considered for all eligible positions. Deadline **December 1, 2016**. Early applications will be regarded favorably.

INSTITUTE FOR ADVANCED STUDY—The School of Mathematics at the Institute for Advanced Study has a limited number of memberships with financial support for research during the 2017-18 academic year. The School frequently sponsors special programs. However, these programs comprise no more than one-third of the memberships so that each year a wide range of mathematics is supported. Candidates must give evidence of ability in research comparable at least with that expected for the Ph.D. degree, but otherwise can be at any career stage. Successful candidates will be free to devote themselves full time to research. About half of our members will be postdoctoral researchers within 5 years of their Ph.D. We expect to offer some two-year postdoctoral positions. Up to 8 von Neumann Fellowships will be available for each academic year. To be eligible for the von Neumann Fellowships, applications should be at least 5, but no more than 15 years following the receipt of their Ph.D. The Veblen Research Instructorship is a three-year position in partnership with the department of Mathematics at Princeton University. Three-year instructorships will be offered each year to candidates in pure and applied mathematics who have received their Ph.D. within the last 3 years. Usually the first and third year of the instructorship will be spent at Princeton University and will carry regular teaching responsibilities. The second year is spent at the Institute and dedicated to independent research of the instructor's choice.

Candidates interested in a Veblen instructorship position may apply directly at the IAS website https://application.ias.edu or they may apply through MathJobs. If they apply at MathJobs, they must also complete the application form at https://applications.ias.edu but do not need to submit a second set of reference letters. Questions about the application procedure should be addressed to applications@math.ias.edu. Also, the School of Mathematics is looking for highly qualified applicants in the field of computer assisted formalization of mathematics, univalent foundations and homotopy type theory and is expecting to offer two or more memberships in this area. In addition, there are also two-year postdoctoral positions in computer science and discrete mathematics offered jointly with the following institutions: The Department of Computer Science at Princeton University, http://www.cs.princeton.edu, DIMACS at Rutgers, The State University of New Jersey, http://www.dimacs.rutgers.edu and the Simons Foundation Collaboration on Algorithms and Geometry, https://www.simonsfoundation.org/mathematics-and-physical-science/algorithms-and-geometry-collaboration/ School term dates for 2017-18 academic year are: term I, Monday, September 25 to Friday, December 22, 2017; term II, Monday, January 15, 2018, to Friday, April 13, 2018.

During the 2017-18 year, the School will have a special program on Locally Symmetric Spaces: Analytical and Topological Aspects. Akshay Venkatesh of Stanford University will be the Distinguished Visiting Professor. The topology of locally symmetric spaces interacts richly with number theory via the theory of automorphic forms (Langlands program). Many new phenomena seem to appear in the non-Hermitian case (e.g., torsion cohomology classes, relations with mixed motives and algebraic K-theory, derived nature of deformation rings). One focus of the program will be to try to better understand some of these phenomena. Much of our understanding of this topology comes through analysis ("Hodge" theory). Indeed harmonic analysis on locally symmetric spaces plays a foundational role in the theory of automorphic forms and is of increasing importance in analytic number theory. A great success of such harmonic analysis is the Arthur-Selberg trace formula; on the other hand, the analytic aspects of the trace formula are not fully developed, and variants such as the relative trace formula are not as well understood. Thus analysis on such spaces, interpreted broadly, will be another focus of the program.

INSTITUTE FOR DEFENSE ANALYSES—The Institute for Defense Analyses Center for Communications Research—Princeton (IDA/CCR-P) is looking for individuals in mathematics, computer science, electrical engineering, and related fields to join in exciting research that enhances our nation's security along with our sponsor, the National Security Agency. Individuals that thrive here enjoy solving difficult problems with a wide range of tools, from mathematics, statistics, computational science, and engineering. Rather than recruiting specific specialties, we are looking for smart PhDs who are willing to learn whatever it takes to solve our ever evolving research problems. Some problems require very deep and sophisticated mathematics, others the latest computational and other technologies, and many problems require both. Ours is a superior professional working environment emphasizing cooperative effort. We are located in Princeton, NJ and benefit from the exciting intellectual environment of our immediate area, as well as the benefits of being close to both New York and Philadelphia. U.S. citizenship and a Department of Defense TS//SI clearance (with polygraph) are required. IDA/CCR-P will sponsor this clearance for those selected. IDA/CCR-Princeton is an equal opportunity employer committed to providing a working environment that is free from discrimination on the basis of race, color, religion, sex (including pregnancy and gender identity), sexual orientation, national origin, age, disability, status as a protected veteran, marital status, genetic characteristic or any other legally protected condition or characteristic. Interested individuals should contact Dr. David J. Saltman (Director) at saltman@idaccr.org with a C.V. and a list of references.

THE MATHEMATICAL SCIENCES RESEARCH INSTITUTE—Located in Berkeley, California, solicits applications for membership in its 2017-18 programs: Geometric Functional Analysis and Applications (Fall 2017), Geometric and Topological Combinatorics (Fall 2017), Group Representation Theory and Applications (Spring 2018), Enumerative Geometry Beyond Numbers (Spring 2018). Apply online beginning **August 1, 2016**. Research Professionships (Deadline **10/1/16**), Postdoctoral Fellowships (Deadline **12/1/16**), Research Memberships (Deadline **12/1/16**). www.msri.org. The Institute is committed to the principles of the Equal Opportunity and Affirmative Action. Students, recent PhDs, women, and minorities are particularly encouraged to apply. MSRI has been supported from its origins by the National Science Foundation, now joined by the National Security Agency, by over 100 Academic Sponsor departments, by a range of Foundation, and by generous and foresighted individuals.

THE UNIVERSITY OF OREGON—Department of mathematics seeks applicants for two full-time tenure-related positions, at the rank of Assistant Professor, in any area of pure or applied mathematics. Minimum qualifications are a PhD in mathematics, statistics, or closely related field. An established outstanding research record, and active participation & excellence in teaching at the undergraduate and graduate levels will be the most important criteria for selection. Please see http://hr.uoregon.edu/jobs/ for a full position announcement. Applicants should provide a standard AMS cover page, CV, research statement, three letters of recommendation, and apply online at mathjobs.org. Deadline for applications: **November 1, 2016**. Candidates should have the ability to work effectively with a diverse community. The University of Oregon is an EO/AA/Veterans/Disability institution committed to cultural diversity.

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THE UNIVERSITY OF OREGON—Paul Olum Postdoctoral Scholar (non-tenure related)—Department of mathematics seeks applicants for a postdoctoral scholar. This is a full-time position renewable for up to three years and is not tenure-related. Minimum qualifications for the postdoctoral position are a PhD in mathematics, statistics, or closely related field; strong evidence of research potential in an area of active interest in the department; and evidence of teaching ability. Please see http://hr.uoregon.edu/jobs/ for a full position announcement. Applicants should provide a standard AMS cover page, CV, research statement, and three letters of recommendation and apply online at mathjobs.org. Deadline for applications is **November 15, 2016**. Candidates should have the ability to work effectively with a diverse community. The University of Oregon is an EO/AA/Veterans/Disability institution committed to cultural diversity.

UNIVERSITY OF CALIFORNIA, IRVINE—The Department of Mathematics invites applications from outstanding candidates for multiple positions, including: tenure-track Assistant Professors, Lecturer with Potential Security of Employment (LPSOE) and Visiting Assistant Professors (VAP). Applicants must hold a Ph.D. Tenure-track Assistant Professor position candidates should have demonstrated excellence in research and teaching. The LPSOE series requires, in addition to excellent teaching and service, that the candidate makes outstanding and externally recognized contributions to the development of his or her specific discipline and/or of pedagogy. VAP candidates must show strong promise in research and teaching. Applications are welcome at any time. The review process starts **November 1, 2016** and will continue until positions are filled. Please visit www.mathjobs.org for details on positions and the application process. The University of California, Irvine is an Equal Opportunity/Affirmative Action Employer advancing inclusive excellence. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability, age, protected veteran status, or other protected categories covered by the UC nondiscrimination policy.

UNIVERSITY OF CALIFORNIA, SANTA BARBARA—Tenure Track Assistant Professor in Mathematics—The Department of Mathematics invites applications for a Tenure-Track Assistant Professor position in Analysis with an emphasis in Partial Differential Equations. UC Santa Barbara offers a unique environment where innovative, interdisciplinary, and foundational research is conducted in a collegial atmosphere. We are looking for candidates who have demonstrated exceptional promise through novel research with strong potential to interact with colleagues in applied analysis, the natural sciences or engineering. Candidates must possess a Ph.D. by September 2017. Appointments begin July 1, 2017. Demonstrated research excellence and potential to become an effective teacher are required.

To apply for this position(s), applicants must submit a curriculum vita, statement of research, statement of teaching philosophy, & the American Mathematical Society cover sheet (available online at http://www.ams.org), & arrange for four letters of reference to be sent (at least one of which is directed towards teaching). Materials should be submitted electronically via https://www.mathjobs.org/jobs/jobs/8907. Applications received on or before **November 1, 2016** will be given full consideration. Questions can be emailed to recruitment@math.ucsb.edu. The Mathematics Department is especially interested in candidates who can contribute to the diversity and excellence of the academic community through research, teaching and service. The University of California is an Equal Opportunity/Affirmative Action Employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, protected veteran status, or any other characteristic protected by law.

UNIVERSITY OF CALIFORNIA, SANTA BARBARA—Joint Lecturer in Mathematics and the College of Creative Studies—The Department of Mathematics and the College of Creative Studies (CCS) at the University of California, Santa Barbara seek applications for a full-time career Lecturer with Potential Security of Employment (similar to tenure-track). This is a joint position in both the Department of Mathematics and the College of Creative Studies and is subject to budgetary approval. The effective start date is July 1, 2017. Qualifications: Candidates must possess a Ph.D. in Mathematics or a closely related field. The successful applicant will be a broadly trained mathematician who is dedicated to teaching small numbers of talented undergraduates in an exceptional program at a research university. Duties and Responsibilities: This position will involve teaching a range of courses in the Department of Mathematics, including lower-division and upper-division undergraduate courses, and in CCS, which runs an intensive program for gifted and highly motivated math majors in conjunction with the Mathematics Department. The CCS position requires close mentoring and supervision of approximately thirty math undergraduates throughout their four-year program in consultation with mathematics faculty who also teach and mentor these math majors. Responsibilities in CCS also include student recruitment and teaching an accelerated sequence designed to enable students to proceed more swiftly to advanced courses. Further information about Mathematics at UCSB can be found at http://www.math.ucsb.edu. Candidates are urged to review the unique nature of the CCS program at http://ccs.math.ucsb.edu. To apply for the position, applicants should submit a letter of interest outlining their experience and qualifications including teaching philosophy together with a curriculum vita, and arrange for at least three letters of recommendation to be sent. Materials should be submitted electronically via http//www.mathjobs.org. Applications received on or before **December 31, 2016** will be given full consideration. The College and Mathematics Department are especially interested in candidates who can contribute to the diversity and excellence of the academic community through research, teaching and service. The University of California is an Equal Opportunity/Affirmative Action Employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, protected veteran status, or any other characteristic protected by law.

WILLIAMS COLLEGE DEPARTMENT OF MATHEMATICS AND STATISTICS—The Williams College Department of Mathematics and Statistics invites applications for two tenure-track positions in mathematics, beginning fall 2017, at the rank of assistant professor (in an exceptional case, a more advanced appointment may be considered). We are seeking highly qualified candidates who have demonstrated excellence in teaching and research and who are committed to working with an increasingly diverse student body. The teaching load is four 12-week semester courses per year and a pass-fail Winter Study class every other January. Preference will be given to candidates who will have a PhD in mathematics by September 2017. We welcome applications from members of groups traditionally underrepresented in the field. Applicants can apply electronically at http://mathjobs.org. Evaluations of applications will begin on or after November 15 and will continue until the position is filled. All offers of employment are contingent upon completion of a background check http://dean-faculty.williams.edu/prospective-faculty/background-check-policy. For more information on the Department of Mathematics and Statistics, visit http://math.williams.edu/.

Williams College is a coeducational liberal arts institution located in the Berkshire Hills of western Massachusetts. The college has built its reputation on outstanding teaching and scholarship and on the academic excellence of its approximately 2,000 students. Please visit the Williams College website (http://www.williams.edu). Beyond meeting fully its legal obligations for non-discrimination, Williams College is committed to building a diverse and inclusive community where members from all backgrounds can live, learn, and thrive.

2016–2017 Individual Membership Form

JOIN ONLINE at www.awm-math.org!

ASSOCIATION FOR WOMEN IN MATHEMATICS

11240 Waples Mill Road
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(703) 934-0163
http://www.awm-math.org
awm@awm-math.org

LAST NAME _____ FIRST NAME _____ M.I. _____

ADDRESS _____

CITY _____ STATE/PROVINCE _____

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AWM's membership year is from October 1 to September 30. Please fill in this information and return it along with your DUES to: AWM Membership, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030.

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

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If student, check one:
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DEGREES EARNED:

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

Individual Dues Schedule

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

☐	REGULAR INDIVIDUAL MEMBERSHIP (New Members ONLY)	$ 30
☐	REGULAR INDIVIDUAL MEMBERSHIP	$ 65
☐	2ND FAMILY MEMBERSHIP	$ 30
	Please indicate regular family member: _____	
☐	CONTRIBUTING MEMBERSHIP (includes designation of a free student membership)	$150
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☐	STUDENT or UNEMPLOYED MEMBERSHIP *(circle one)*	$ 20
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Volume 46, Number 5, September–October 2016

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