AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

Newsletter

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The purpose of the Association for Women in Mathematics is

- to encourage women and girls to study and to have active careers in the mathematical sciences, and
- to promote equal opportunity and the equal treatment of women and girls in the mathematical sciences.

IN THIS ISSUE

PRESIDENT'S REPORT

AWM at the Joint Mathematics Meetings (JMM). In the next six weeks, AWM staff and volunteers are preparing for a variety of events at the JMM in San Diego, January 9–12, 2013.

On Wednesday the 9th, the AWM Executive Committee holds its annual in-person meeting. Later that day, the AWM holds its business meeting, open to the public. At the business meeting, **Ruth Charney**, Brandeis University, will be recognized as the incoming President of AWM for a two-year term starting on February 1, 2013. In the hour prior to the business meeting, you are invited to join us for an AWM panel discussion on "The Retention of Women in Mathematics," organized by **Ami Radunskaya**, Pomona College, and **Christina Sormani**, City University of New York. This panel is being organized in response to an article in *Science* entitled "Survival Analysis of Faculty Retention in Science and Engineering by Gender." Following the Gibbs Lecture, AWM will host an evening reception. Refreshments, a cash bar, fun, and some special announcements are planned.

On Thursday morning, January 10, the thirty-fourth annual Noether Lecture will be given by **Raman Parimala**, the Arts and Sciences Distinguished Professor of Mathematics at Emory University. She was selected for this honor for her fundamental work in algebra and algebraic geometry with significant contributions to the study of quadratic forms, hermitian forms, linear algebraic groups and Galois cohomology. At the Joint Prize Session on Thursday afternoon, AWM will award three prizes. **Amy Cohen**, Professor of Mathematics at Rutgers University, will receive the 2013 Louise Hay Award in recognition of her contributions to mathematics education. **Jim Morrow**, University of Washington, will be the third recipient of the Humphreys Prize in recognition of his extraordinary contributions to the mentoring of undergraduate women in mathematics. **MurphyKate Montee**, a senior honors mathematics major and music double major at the University of Notre Dame, will receive the 2013 Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman. I would like to thank the volunteers staffing these selection committees for their hard work helping AWM to support and honor women in the profession. While the work of each of these committees is difficult, the Schafer Prize Committee has the especially agonizing task of choosing just one undergraduate woman to honor for her achievements. The committee also chooses a Runner Up and several Honorable Mentions: these very talented and accomplished women will be introduced at the AWM Reception at JMM 2013 and will be profiled in the March/April newsletter.

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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*

The AWM graduate student poster session and public reception on Friday evening marks the beginning of the National Security Agency funded AWM-JMM workshop activities. **Kathryn Leonard** is organizing this session. The JMM workshop on number theory, organized by **Kristin Lauter** (MSR) and **Bianca Viray** (Brown University), has both a morning and afternoon session on Saturday the 12th. All are welcome to attend the short talks.

AWM Research Conferences and collaboration networks. Academic mathematics research is an increasingly collaborative enterprise. The percentage of single authored publications is rapidly declining, and the mean number of authors per publication has risen significantly in just the last decade. Evidence shows that collaboration also increases the number of publications per individual and thus can be an important factor in professional advancement. Typically, such collaborations and interactions take place at conferences, in environments conducive to informal interaction. The opportunity to participate regularly in such conferences is a critical, and potentially elusive, goal for members of underrepresented groups. To address these issues, AWM envisions incorporating the JMM workshops into a series of interconnected research conferences that bring together junior and senior women in a specific field for talks and collaborative interactions. The research conferences will be modeled on the Women in Numbers (WIN) and Algebraic Combinatorixx (ACxx) workshops, both of which have had demonstrated success in forming collaborative networks, as well as glowing testimonials from participants. This fall, AWM submitted an ADVANCE PAID grant proposal to fund this interconnected conference series and to evaluate its impact on the careers of the participating women. We envision that in each calendar year, a different area of mathematics would be featured at the research conferences, and a follow-up workshop at JMM would showcase research outcomes by some of the early career female participants. In fact, this is the model we have been working toward for the calendar year 2013. In July 2013, the Institute for Pure and Applied Mathematics (IPAM) hosts the research conference "Women in Shape: Modeling Boundaries of Objects in 2 and 3 Dimensions," organized by **Kathryn Leonard**, CSU Channel Islands, and **Luminita Vese**, UCLA. The conference is held in cooperation with AWM and will be followed by a 2014 JMM focused workshop on shape modeling. We gratefully acknowledge the support of IPAM, and of other sponsors including MSR and NSF, for this workshop. Indeed, the NSF Mathematics Institutes are strong supporters of AWM: they have contributed staff and financial support for AWM research conferences and they coordinate additional significant contributions to diversity and equal opportunity in many ways.

Update on AWM Research Symposium 2013. The conference is scheduled for March 16 and 17 at Santa Clara University. The NSF institutes AIM and MSRI are co-sponsors of the conference, and MSRI has been maintaining the web page for the event: http://www.msri.org/web/msri/scientific/workshops/show/-/event/Wm9752. I am happy to report that some financial support for this conference will be provided by the National Security Agency through a grant to AWM. Additional support for this event is pending.

Inaugural Fellows of the American Mathematical Society. The inaugural class of AMS Fellows was announced in November 2012, and about ten percent of the Fellows were women. The selection criteria included membership in

AMS and having given an invited AMS, ICM, or ICIAM address or having been awarded an AMS research prize. An additional fifty members were selected who were judged to have made excellent contributions to the profession yet did not fulfill these criteria. AWM encourages the creation of new avenues for recognizing leadership and excellent contributions to the profession. The relatively small percentage of women in this inaugural class is probably due to the underrepresentation by women in the profession overall and to the residual effects of many years of a societal failure to encourage women in mathematics. In 1971, the year that AWM was founded, there were no women invited speakers at the JMM. This year, the AMS web page features three women among the six highlighted speakers.

AWM at SIAM annual. Preparations are also underway for AWM panels and workshops (minisymposia) at the SIAM Annual Meeting in San Diego in July 2013. Many thanks to our volunteers: **Elebeoba (Chi-Chi) May**, University of Houston, and **Sigal Gottlieb**, UMass Dartmouth, are coordinating the workshops, and **Maria Emelianenko** and **Beatrice Riviere** are the organizers for the general minisymposium and poster session respectively.

AWM K–12 activities and programs. AWM has been involved in several major activities aimed at encouraging the mathematical interests and participation of middle and high school girls: the Sonia Kovalevsky Days, the Essay Contest sponsored by Math for America, and the USA Science and Engineering Festivals. We are presently working to ensure continued sponsorship and funding for these rewarding and important activities.

Opportunities at NSF Mathematics Institutes. The upcoming summer workshop at IPAM and AWM Research Symposium 2013 co-sponsored by AIM and MSRI are just two examples of the many opportunities of interest to AWM members provided by the Mathematics Institutes. There are eight NSF Mathematics Institutes across the US offering a variety of programs, workshops, summer schools, postdoctoral and graduate student support, undergraduate research opportunities, and special events. I encourage AWM members to look for opportunities to participate in institute events: more information can be found at http://www.mathinstitutes.org/.

Jill Pipher
Providence, RI
November 26, 2012

Jill Pipher

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

Institutional Membership Levels
Category 1: $325
Category 2: $325
Category 3: $200
Category 4: $175
See www.awm-math.org for details on free ads, free student memberships, and ad discounts.

Sponsorship Levels
α **Circle:** $5000+
β **Circle:** $2500–$4999
γ **Circle:** $1000–$2499

See the AWM website for details.

Subscriptions and Back Orders—All members receive a subscription to the newsletter as a privilege of membership. Libraries, women's studies centers, non-mathematics departments, etc., may purchase a subscription for $65/year ($75 foreign). Back orders are $10/issue plus S&H ($5 minimum).

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

Newsletter Ads—AWM will accept ads for the *Newsletter* for positions available, programs in any of the mathematical sciences, professional activities and opportunities of interest to the AWM membership and other appropriate subjects. The Managing Director, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the* Newsletter *must be Affirmative Action/Equal Opportunity designated.* Institutional members receive discounts on ads; see the AWM website for details. For non-members, the rate is $116 for a basic four-line ad. Additional lines are $14 each. See the AWM website for *Newsletter* display ad rates.

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

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

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.

Blog Roll

Michelle Manes, Mathematics Department, University of Hawai`i, Honolulu, HI 96822, mmanes@math.hawaii.edu

In recent years, the number of mathematical and scientific blogs (along with blogs of all kinds) has exploded. These include:

- blogs run by and for graduate students or young faculty,[1]
- blogs run by faculty in academic mathematics departments,[2]
- blogs run by professional societies,[3]
- blogs run by scientific journals,[4]
- personal blogs of well-known professional mathematicians,[5] and even
- blogs where hundreds of mathematicians collaborate on open problems.[6]

With all of the other demands on our time as mathematicians, none of us can (or probably should) read more than a few of these blogs on a regular basis. I don't actually read any of the blogs above with any regularity. (Sorry, bloggers!)

Instead, I follow a handful of personal blogs written by female scientists and mathematicians. In an era when even my mom wants to start a blog, what keeps me coming back to the same few bloggers every week? What I find in these blogs is a bit hard to define: thoughtful analysis of topics I care about? humor and insight? community and the sense that I'm not the only one with these experiences and frustrations? I find all of this and more.

In this note, I'd like to introduce you to three of my favorite bloggers (bloghers?). This is by no means a comprehensive list; it just describes the blogs that I actually make time for, usually in the morning while drinking coffee and slowly joining the world of the conscious.

Mathbabe (http://mathbabe.org/). Cathy O'Neil is a PhD mathematician who worked in academia but didn't feel the career was a good fit for her personality. She started her blog in 2011, after leaving a job in finance. Frustrated with the corruption of that industry, she wanted to expose the methods used in finance so that people could better understand it. Cathy describes her audience as "mathematicians who don't know how finance works" as well as the college-educated public who perhaps don't know mathematics as well.

Cathy won me over with her very first post, "What's it take to be a woman in math?"[7] Since then I've become a follower of her blog, reading several posts each week on a variety of topics, including:

- things I know and care about (women in mathematics, working in academia, math education);

- things I don't know much about but enjoy learning about (data science, the Occupy Wall Street movement);
- things that I should know more about as an adviser to undergraduate and graduate students in mathematics (the explosion of job opportunities for mathematicians outside of academia); and
- things that I should know more about as a citizen (the financial industry and politics).

Here are a few of my favorite posts—the ones I thought about, talked about, and forwarded to my friends and family.

Should short selling be banned?[8] I never understood what it meant to "short-sell" a stock; I just had this vague notion that it was bad and illegal. Cathy set me straight! Banning short selling is a purely political move. In her typical pull-no-punches style, Cathy describes it as "a way of avoiding knowing the truth."

The value-added model of teacher evaluation.[9] I can't begin to describe my gratitude that smart people like Cathy are publicly calling the value-added model into question. As a former high school teacher and someone who continues to work closely with K–12 teachers and schools, this issue is very close to my heart. Cathy wants people to understand how mathematics has been used and abused by politicians and others in this context, in the financial industry, and everywhere else. She describes the pervasive use of arguments like, "You wouldn't understand this because it's math …" and "This must be right because it's math …" as "weapons of math destruction."

Math in business.[10] Thanks to Cathy, I know a lot more about non-academic careers, which can only benefit my current and future students. Beyond that, I find her writing on the subject inspirational and uplifting, and who wouldn't want to start the day feeling inspired and uplifted?

Cathy also writes many personal posts about her experiences as a "math nerd" growing up and the work she does now to encourage math nerd kids everywhere. I'll leave it to you to ferret out those posts if you're interested enough to poke around her blog archives for a bit.

The Accidental Mathematician (http://ilaba.wordpress.com/). Izabella Laba is a Professor in the Department of Mathematics at the University of British Columbia. She blogs beautifully if too infrequently on a variety of topics, mathematical and otherwise. I wish her blog were more widely read than it seems to be, because she writes with tremendous wit and unflinching honestly about topics like:

- sexism and gender bias, including her own experiences;
- underrepresentation of women in academia and in online communities; and
- math and science in the news and popular culture.

She also blogs about cats and posts beautiful nature photographs, but that's just a bonus. Again, here are a few of my favorite posts over the years.

Working as a woman in academia.[11] One of the first posts I read on Izabella's blog told her story of being hired at UBC under the University Faculty Awards program, which is directed to women and Aboriginal peoples. It took a real effort for her to establish a productive research program because she was so isolated (research-wise) in her department. I identified with that struggle as well as with her frustration at the simple-minded "hire more women!" approach to tackling difficult issues of underrepresentation. Also, the advice she passes along on dealing with (perhaps) well-meaning "Senior Male Scientists" has proven invaluable.

Gender bias.[12] Honestly, anything I write about these posts won't do them justice. If you have any interest in understanding gender bias in academic science and working towards equality, I encourage you to just go read them yourself. They're brilliant.

Underrepresentation of women online.[13] Long before Facebook, blogs, and MathOverflow, I read and posted to Usenet newsgroups. I learned very quickly—through sexist rants and personal contact that bordered on harassment—that my online handle should be gender-neutral. I still probably spend more time in nerd-centric online communities than most people, let alone most women. And yes, I still usually hide my gender, whether out of habit or lingering fear. Perhaps one thing I find refreshing about blogs run by female mathematicians is not feeling the need to hide behind a pseudonym. In any case, Izabella articulates some of the reasons women are underrepresented (or appear to be) in these communities; judging by the comments she definitely struck a nerve.

Responding to the media.[14] When the *New York Times* publishes drivel like Andrew Hacker's opinion piece titled "Is algebra necessary?" I rant to family, friends, and anyone who will listen. I wish that I could, instead, write a clearly reasoned and articulate counter-argument. Fortunately, I don't need to because bloggers like Izabella are able to keep a cool head and write what I'm thinking, probably better than I ever could.

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PhD+epsilon (http://blogs.ams.org/phdplus/). Adriana Salerno is an Assistant Professor in the Mathematics Department at Bates College in Lewiston, ME. In the summer of 2007, she was the AMS-AAAS Mass Media Fellow, which led to her annual gig blogging the Joint Mathematics Meetings and later to her blog about experiences as a young faculty member just a few years out of her PhD.

Adriana writes about teaching, research, conferences, and the experiences and challenges of being an early career mathematician. Because Adriana and I are at similar career stages, I enjoy reading her blog and (electronically) commiserating about things like

- publication, reviews, and tenure worries;[15]
- complicated questions about running into students in social situations and what "being a role model" really means;[16] and
- creative ways to teach (and test) well.[17]

Perhaps because Adriana's blog is officially hosted by the AMS, she shies away from some of the more controversial or personal topics discussed by Cathy and Izabella in their blogs, but I love the mix of research, teaching, and navigating the world of academia that she discusses. Adriana's experiences as an early-career female mathematician are often similar to mine; yet they are also, sometimes, very different. Reading her blog is the next best thing to actually having a colleague in my department with whom I can share challenges, successes, and funny stories.

Mathematicians in the public sphere. I truly believe that we need greater numbers of mathematicians and scientists participating in public discourse—questioning the models that more and more govern our lives, responding to attacks on education and science, and influencing the public's perception of mathematics, science, and the people who do them (I hope for the better). I wish newspapers would report on the issues half as intelligently as these bloggers do. For now, I'll just keep following their blogs. As a consequence, I'll feel occasionally outraged, sometimes inspired, and always less isolated in my career.

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1 http://sbseminar.wordpress.com/, http://youngmathematiciansnetwork.wordpress.com/
2 http://math.hawaii.edu/wordpress/, http://blogs.cofc.edu/owensks/
3 http://blogs.ams.org/, http://www.maa.org/aboutmaa/social.html

AWM Research Symposium 2013 – Poster Sessions and Contributed Paper Sessions

AWM invites early-career women to give poster presentations and women to present contributed papers at AWM Research Symposium 2013 at Santa Clara University, March 16–17, 2013. This meeting will also feature 3 plenary talks, 11 special sessions on a wide range of topics in pure and applied mathematics, a banquet, and opportunities for discussion and networking.

20–25 women will be selected to present posters. AWM has applied for funding and hopes to be able to offer partial support for expenses for poster presenters. Applications are welcome from women who have received their PhDs within approximately the last three years and from graduate students who have made substantial progress on their doctoral thesis. All such applications should include a cover letter, a title and brief abstract (no more than 1 or 2 paragraphs) of the proposed poster, a curriculum vitae, and a *brief* letter of recommendation from a faculty member or research mathematician who knows the applicant's research. In particular, graduate students should have a letter of recommendation from their thesis adviser. Applications should be submitted at https://www.mathprograms.org/db/programs/175 by **January 15, 2013**. Late applications and/or recommendation letters cannot be accepted. Decisions on applications are expected to be made no later than January 31, 2013.

Participants interested in giving contributed talks should submit the title of the talk, the speaker's name and affiliation, and a brief abstract (at most 1 or 2 paragraphs) via https://www.mathprograms.org/db/programs/183 by **January 20, 2013**. Decisions on applications are expected to be made no later than February 1, 2013.

4 http://blogs.sciencemag.org/, http://blogs.discovermagazine.com/

5 http://terrytao.wordpress.com/, http://gowers.wordpress.com/

6 http://polymathprojects.org/

7 http://mathbabe.org/2011/06/11/whats-it-take-to-be-a-woman-in-math/

8 http://mathbabe.org/2011/08/26/should-short-selling-be-banned/

9 http://mathbabe.org/2011/08/20/how-the-value-added-model-sucks/, http://mathbabe.org/2012/03/06/the-value-added-teacher-model-sucks/, http://mathbabe.org/2012/09/14/why-are-the-chicago-public-school-teachers-on-strike/

10 http://mathbabe.org/2011/10/22/math-in-business/, http://mathbabe.org/2011/06/22/inspirational-speech-for-women-in-math/

11 http://ilaba.wordpress.com/2007/12/11/women-in-math-or-sisters-are-doing-it-for-themselves/, http://ilaba.wordpress.com/2009/11/17/right-back-at-ya/

12 http://ilaba.wordpress.com/2010/06/17/an-entirely-positive-approach-or-something/, http://ilaba.wordpress.com/2012/10/02/the-perils-of-changing-the-subject/

13 http://ilaba.wordpress.com/2011/03/28/why-im-not-on-mathoverflow/, http://ilaba.wordpress.com/2008/02/22/its-my-party-and-i-blog-if-i-want-to/

14 http://ilaba.wordpress.com/2012/07/29/too-innumerate/, http://ilaba.wordpress.com/2010/06/04/more-on-mathematics-and-madness/

15 http://blogs.ams.org/phdplus/category/submitting-a-paper-for-publication/, http://blogs.ams.org/phdplus/category/pre-tenure-reviews/, http://blogs.ams.org/phdplus/2011/12/12/review-rinse-repeat/

16 http://blogs.ams.org/phdplus/2011/05/11/asymptotic-behavior/

17 http://blogs.ams.org/phdplus/2011/03/31/test-making-anxiety/, http://blogs.ams.org/phdplus/2011/10/28/the-skype-is-the-limit/, http://blogs.ams.org/phdplus/2012/06/11/the-case-of-the-kidnapped-professor/, http://blogs.ams.org/phdplus/2011/10/19/the-clicker-clique/

CALL FOR NOMINATIONS

2014 M. Gweneth Humphreys Award

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

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

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

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

EDUCATION COLUMN

Introduction by Patricia Hale, Department of Mathematics and Statistics, California State Polytechnic University, Pomona

At this time, one of the most significant topics in mathematics education is the current events surrounding Jo Boaler's work. A better person than myself to discuss these events, and their impact on mathematics education, is my daughter Jessica Hale. Ms. Hale's qualifications for this are: she was a student, and is a protégé, of Dr. Boaler's; she was known as the math educator in the mathematics program where she received her Master's Degree in August (University of West Georgia); she is often referred to as the mathematician in the mathematics education doctoral program she is in (Georgia State University); her research interests include looking at why the practices of mathematics teachers and mathematics teacher educators often do not reflect the practices recommended by mathematics education research.

Practicing What We Preach

Jessica James Hale, Department of Middle, Secondary Education and Instructional Technology, Georgia State University

In October of this year Jo Boaler (Stanford University), one of the most highly esteemed researchers in the field of mathematics education, released a statement alleging a decade of harassment she has endured from those who oppose the findings of her work; she discussed in detail the actions of two men, Wayne Bishop and James Milgram. The harassment Boaler describes goes well beyond the bounds of academic discourse and disagreement. Boaler alleges these men encouraged her not to publicize her work, described her as "the worst possible scenario—a researcher in a top university with data," made claims of scientific misconduct (which were investigated and determined to be unfounded), and went to extremes to try and reveal the identities of the students, teachers and schools used in Boaler's research. Milgram and Bishop posted an unpublished paper to Milgram's Stanford webpage stating multiple accusations, including an accusation that Boaler falsified data in her research (Boaler, 2012; Bishop, Clopton, Milgram, n.d). Throughout this time, Boaler was encouraged to ignore these attacks and, in the name of protecting academic freedom, no action was taken against Milgram or Bishop (Jaschik, 2012). Boaler eventually left Stanford and returned to the UK (Boaler, 2012; Jaschik, 2012). To the delight of many U.S. mathematics education researchers, she has returned to Stanford and is no longer heeding the advice she was previously given. She is sharing her story. Her public statement and her keynote speech at this year's annual conference of the North American Chapter of the International Group for the Psychology of Mathematics Education led to Jeremy Kilpatrick (University of Georgia, Athens) initiating a petition requesting that Stanford take action, including the removal of the unpublished paper from Milgram's Stanford webpage (Kilpatrick, n.d).

Like many members of the mathematics community, I was shocked by the extent of the harassment that Boaler endured. As a Stanford alumnus, I was outraged at the lack of support my alma mater had provided for such an esteemed professor. These events were more than an attack on a colleague; they were an attack on the field of mathematics education. As a mathematics education researcher, and as a mathematician, Boaler's experiences forced me to look at my professional environment. I have found myself asking difficult questions about my field. Questions that I feel many of us should be asking, even if we don't have the answers yet. Questions such as: Would attacks such as these have been allowed to carry on if it were a mathematics educator making them against a mathematician? Would these events have occurred if Boaler were a man? What is it about Boaler's work that induces such fear (I am assuming that fear is the root of the behavior) that these men felt these attacks necessary? Perhaps the time has come, or is long overdue, for us to critically look at the status and power dynamics in the field of mathematics education.

The dynamic of mathematicians being critical or dismissive of math education research is nothing new. But criticism reaching the level of harassment against a researcher of Boaler's caliber is certainly extreme. Considering this, we could discuss the role of mathematicians' perceptions in acceptance of mathematics education research, or the role these perceptions may (or may not) play in oppressing the body of work. That is a conversation that needs to happen, but rather than focusing on those in other fields, perhaps it would be more productive for math educators to look at their own community and how we support, and hinder, one another's work.

The lack of data, either quantitative or qualitative, that examines those participating in the field of mathematics education is a dangerous problem. Although there is data on the demographics of new PhDs in education (all areas) and mathematics (all areas), I was unable to find tracked data about those earning doctorates in, or who are working in, the field of mathematics education ("Characteristics of Recipients of Earned Doctorates, 2007"; "2007 Annual Survey of Sex, Race/Ethnicity & Citizenship of New Doctoral Recipients").

Of course, part of this is because individuals in this field hold PhDs and EdDs, in mathematics, curriculum and instruction, teaching and learning, and numerous other fields, but with a specialization in mathematics education. Further, many who work in this field do not work in mathematics education departments. Some researchers work in mathematics departments, others in STEM education centers, others in departments of middle and secondary education or of urban education. Mathematics education is a field that is still finding its academic identity, and with that comes a "messiness" in tracking basic information about the work we do and the people who do it. However, this indicates the need for the mathematics education community to organize the messiness, to collect data so that we can self-evaluate, and to join together when our work is marginalized or attacked. Particularly, collecting data and reporting concerns to those in other fields would have more validity if we were first expert at examining and improving our own professional environment. Further, this is especially important for the example math teacher educators should be setting for our future teachers and educators.

As mathematics teacher educators, we charge our students with being advocates for change in their classrooms, schools, and the communities they work in. We task these future educators to be advocates for their students, to create high but attainable expectations, and to strive for equitable classrooms. We ask them to challenge the education status quo and to demand better. Yet do we model these things in our own practice? Are we advocates for our students (the future teachers and researchers)? Do we strive for equitable classrooms at the universities where we work? Do we challenge the status of mathematics education research and demand universities do better?

As education researchers we know the best way to shape a teacher's pedagogical practice is to model effective pedagogy in all teacher preparation courses. Perhaps it is time to apply this same model to the social justice work we ask our future teachers to participate in. Certainly, at a minimum, we need to be diligent in recognizing implicit bias in our own departments and universities. Just as we suggest that our

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NSF-AWM Mentoring Travel Grants for Women

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.

Mathematics Education Mentoring Grants. Women mathematicians who wish to collaborate with an educational researcher or to learn about educational research may use the mentoring grants to travel to collaborate with or be mentored by a mathematics education researcher. In order to be considered for one of the travel grants, a mathematics applicant must hold a doctorate in mathematics. A mentor should hold a doctorate in mathematics education or in a related field such as psychology or curriculum and instruction. The applicant's research must be in a field which is supported by the Division of Mathematical Sciences of the National Science Foundation.

Selection Procedure. AWM expects to award up to seven grants, in amounts up to $5,000 each. Awardees may request to use any unexpended funds for further travel to work with the same individual during the following year. In such cases, a formal request must be submitted by the following February 1 to the selection committee or funds will be released for re-allocation. (Applicants for mentoring travel grants may in exceptional cases receive up to two such grants throughout their careers, possibly in successive years; each such grant would require a new proposal and would go through the usual competition.) For foreign travel, U.S. air carriers must be used (exceptions only per federal grant regulations; prior AWM approval required).

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

Deadline. There is one award period per year. Applications are due **February 1, 2013**.

EDUCATION COLUMN *continued from page 9*

students do in their future professional settings, we should share our work with colleagues whose teaching choices may be hindering access to mathematics. More importantly, we should then share that experience (whether it be good or bad) with others in the math education community—so that we can all learn how to facilitate change. We need to stop accepting common practices in our teacher preparation programs because we have been told that they are what we "have to do." And let us no longer sit idle while the research we do and the scientists who do this research are attacked.

When we are not acting as advocates ourselves, expecting the future educators that we work with everyday to be able to be advocates of change in their schools, is just as effective as lecturing about group work. We must begin: sharing our successes and struggles with advocating for change, removing the policies we know hinder the future educators we work with, monitoring our profession to ensure it exists in an equitable environment, and demanding that our profession be recognized for its merit. We have no right to ask the future educators we work with to do the same until we are doing it ourselves. As educators of educators we need to start practicing what we preach.

References

2007 Annual Survey of Sex, Race/Ethnicity & Citizenship of New Doctoral Recipients. *Notices of the AMS*. Retrieved from http://www.ams.org/profession/data/annual-survey/2007Survey-SREC.pdf

Bishop, W., P. Clopton, & J. Milgram. (n.d.). A Close Examination of Jo Boaler's Railside Report. Retrieved from ftp://math.stanford.edu/pub/papers/milgram/combined-evaluations-version3.pdf

Boaler, J. (2012, October). When Academic Disagreement Becomes Harassment and Persecution. Stanford University. Retrieved from http://www.stanford.edu/~joboaler/

Characteristics of Recipients of Earned Doctorates, 2007. *The Chronicle of Higher Education.* Retrieved from http://chronicle.com/article/Characteristics-of-Recipients/48037/

Cohen, E. G. (1986). *Designing groupwork: Strategies for the heterogeneous classroom.* New York: Teachers College Press.

Jaschik, S. (2012, October 15). Casualty of the Math Wars: Stanford Professor Goes Public on Attacks over Her Math Education Research, *Inside Higher Ed.* Retrieved from http://www.insidehighered.com/news/2012/10/15/stanford-professor-goes-public-attacks-over-her-math-education-research

Kilpatrick, J. (n.d.). The community of mathematics educators: Join in defending fundamental values. Retrieved from http://www.change.org/petitions/the-community-of-mathematics-educators-join-in-defending-fundamental-values

Women as Academic Authors, 1665–2010. (n.d.). *The Chronicle of Higher Education.* Retrieved from http://chronicle.com/article/Women-as-Academic-Authors/135192/

CALL FOR NOMINATIONS

The 2014 AWM Research Prizes

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

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

Nominations 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) two letters supporting the nomination (submitted independently). Nomination materials should be submitted online at MathPrograms.org. The submission links 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, 2013**. If you have any questions, phone 703-934-0613 or email awm@awm-math.org.

BOOK REVIEW

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

Crafting by Concepts: Fiber Arts and Mathematics, edited by sarah-marie belcastro and Carolyn Yackel. AK Peters/CRC Press, 2011, ISBN-13: 978-1568814353

Reviewer: *Heidi Burgiel, Department of Mathematics, Bridgewater State University*

Crafting by Concepts presents crafting projects firmly grounded in theoretical mathematics to a wide range of readers. Whether you're a student, a teacher, a researcher or a designer, there's something in it for you.

The book is lavishly illustrated and well edited. Each pattern in it was tested by a non-mathematician before publication. The material is loosely organized to flow from projects founded on analysis at the front, through patterns based on discrete mathematics, to symmetry based projects at the end. Naturally, all the material is geometric in some way.

Because each chapter was contributed by a different author, each has its own character. The early chapters—on knitting surfaces of revolution and helix striping—will appeal to skilled knitters and designers; these suggest a wide range of possibilities without dwelling on the minutae of style of decrease or short row. In contrast, the instructions for crocheting squared rectangles and sewing semiregular quilts are lovingly precise and detailed.

Like the pattern difficulty, the mathematical content and rigor varies from chapter to chapter; three different notations describing symmetry groups are used in this book! The chapter on Sierpinski triangles (Fashioning Fine Fabrics From Fiber) explores concepts from discrete mathematics and has the most accessible description of fractal dimension this reviewer has ever encountered, while Knit Knit Revolution is firmly rooted in analysis. Despite the differences between chapters, the level of rigor is consistently appropriate to a well-educated general audience.

Each full chapter includes a Teaching Ideas section, ranging in difficulty from practicing measurement (the Sierpinski triangle chapter includes a custom ruler) to computer algebra exercises (Knit Knit Revolution) and spherical geometry (Spherical Symmetries of Temari). There is something in this book for almost any math class, although careful selection and tailoring is required.

Perusing these diverse articles in a single book, one becomes keenly aware of the need for a broader overview highlighting and utilizing the connections between projects. A survey paper might address broader questions such as "given a mathematical concept, what crafts are most appropriate for representing that concept?" A designer's handbook might include step by step, detailed instructions together with suggestions for creating one's own designs. A student workbook could bring the tools of one chapter to bear on the projects of another, including Sierpinski triangles cross stitched on plastic canvas or a two-color tatted 3.3.3.3.3.3 tessellation.

CALL FOR NOMINATIONS

2014 Louise Hay Award

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

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

Accomplishments

American Academy of Arts and Sciences Inducts 232nd Class of Fellows

American Academy of Arts and Sciences, October 2012 and Barnard College, April 2012

Joan S. Lyttle Birman, Research Professor and Professor Emerita of Mathematics, Barnard College, Columbia University, signs the American Academy of Arts and Sciences' Book of Members, a tradition that dates back to 1780.

Joan S. Lyttle Birman was among one hundred-eighty influential artists, scientists, scholars, authors, and institutional leaders who were inducted into the American Academy of Arts and Sciences at a ceremony in Cambridge, MA, in October 2012. A highly accomplished mathematician, Birman's research focuses on knots, braids, 3-manifolds, and mapping class groups of surfaces as well as related topics in geometric group theory, algorithms, contact geometry, and dynamical systems.

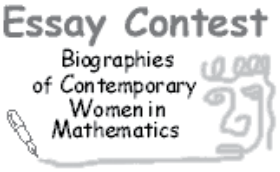
Founded in 1780, the American Academy is one of the nation's oldest and most prestigious learned societies and an independent research center that draws from its members' expertise to conduct studies in science and technology policy, global security, the humanities and culture, social policy, and education.

"Induction recognizes the achievement and vitality of today's most accomplished individuals who together with the Academy will work to advance the greater good," said Academy President Leslie Berlowitz. "These distinguished men and women are making significant strides in their quest to find solutions to the most pressing scientific, humanistic, and policy challenges of the day."

Participants in the ceremony included: Yale University historian David Blight, actor Daniel Day-Lewis, American baritone Thomas Hampson, Supreme Court advocate Maureen Mahoney, University of Wisconsin biologist Margaret McFall-Ngai, business leader and philanthropist Penny Pritzker, and Cornell University mathematician Steven Strogatz.

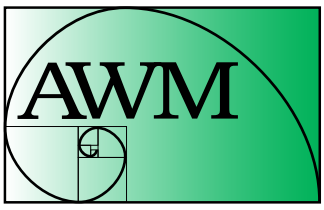
An alphabetical list of the new Academy members is located at: http://www.amacad.org/news/alphalist2012.pdf. The new class listed by discipline is located at: http://www.amacad.org/news/classlist2012.pdf.

Since its founding by John Adams, James Bowdoin, John Hancock, and other scholar-patriots, the American Academy has elected leading "thinkers and doers" from each generation. The current membership includes more than 300 Nobel laureates, some 100 Pulitzer Prize winners, and many of the world's most celebrated artists and performers.



To increase awareness of women's ongoing contributions to the mathematical sciences, the Association for Women in Mathematics holds an essay contest for biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers. AWM is pleased to announce that the 2013 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 hlweis5@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, 2013**. (To volunteer as an interview subject, contact Heather Lewis at the email address given.)



ASSOCIATION FOR WOMEN IN MATHEMATICS

AAAS Welcomes "Mathematics of Planet Earth" for 2013 Program

Edward Aboufadel, Secretary of Section A of the AAAS, aboufade@gvsu.edu

The American Association for the Advancement of Science (AAAS), founded in 1848, is the world's largest general scientific society, with over 120,000 individual and institutional members. The AAAS is divided into 24 disciplinary-based sections, including Section A (Mathematics). The 2013 annual meeting of the AAAS will be held in Boston on February 14–28. The theme of this year's meeting is "The Beauty and Benefits of Science," and this year's meeting features sessions that are part of Mathematics of Planet Earth 2013 (mpe2013.org).

The AAAS Annual Meeting is organized into symposia which have three or more speakers and often a discussant who reflects on the talks that are given. Section A is sponsoring four symposia this year, featuring outstanding expository talks by prominent mathematicians and scientists. The four symposia sponsored by Section A this year are:

- Mathematics of Tipping Points: Framework, Applications, and Prediction, organized by Mary Lou Zeeman, Bowdoin College. (MPE 2013 symposium; scheduled speakers: Mary Silber, Sebastian Wieczorek, and Marten Scheffer.)
- Understanding and Communicating Uncertainty in Climate Change Science, organized by Richard L. Smith, University of North Carolina. (MPE 2013 symposium;

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NSF-AWM Travel Grants for Women

Mathematics Travel Grants. Enabling women mathematicians to attend conferences in their fields provides them a valuable opportunity to advance their research activities and their visibility in the research community. Having more women attend such meetings also increases the size of the pool from which speakers at subsequent meetings may be drawn and thus addresses the persistent problem of the absence of women speakers at some research conferences. The Mathematics Travel Grants provide full or partial support for travel and subsistence for a meeting or conference in the applicant's field of specialization.

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

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

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

Eligibility and Applications. These travel funds are provided by the Division of Mathematical Sciences (DMS) of the National Science Foundation. The conference or the applicant's research must be in an area supported by DMS. Applicants must be women holding a doctorate (or equivalent) and with a work address in the USA (or home address, in the case of unemployed applicants). Please see the website (http://www.awm-math.org/travelgrants.html) for further details and do not hesitate to contact Jennifer Lewis at 703-934-0163, ext. 213 for guidance.

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

scheduled speakers: Murali Haran, Leonard Smith, and Mark Berliner.)

- Compressive Sensing: Sensing Sparse Phenomena in Theory and Practice, organized by Mark Davenport, Stanford University. (Scheduled speakers: Mark Davenport, Justin Romberg, Dave Brady, Anna Gilbert, and Rachel Ward.)
- Multi-scale Study of Cancer, organized by Mark Alber, University of Notre Dame and Jill Mesirov, the Broad Institute of Harvard and MIT. (Scheduled speakers: Martin Nowak, Kathleen Wilkie, and Philip Maini.)

Among other symposia that will be of interest to the mathematical community are:

- Is Beauty Truth? Mathematics in Physics from Dirac to the Higgs Boson and Beyond
- Predictability: From Physical to Data Sciences
- The Science of Uncertainty in Genomic Medicine
- Predictive Model of the Internal Combustion Engine
- Computation, Computational Efficiency, and Cognitive Science
- How Fundamental Computing Research Touches Everyday Lives
- Smart Phones, Smart Devices, Social Networks, and Smart Health Care
- Visualizing Chemistry: Seeing Another Dimension of Plants and Animals
- The 25th Anniversary of the First Collection in the History of Women in Science

The above symposia are only a few of the more than 150 AAAS symposia this year in the physical, life, social, and biological sciences. For further information, including the schedule of talks, go to www.aaas.org/meetings. Section A acknowledges the generous contributions of the American Mathematical Society for travel support for speakers this year.

The AAAS Annual Meeting is the showcase of American science, and the AAAS seeks active participation by mathematicians and mathematics educators. Looking ahead, the AAAS Program Committee is genuinely interested in offering symposia each year on topics in pure and applied mathematics. For example, in recent years there have been symposia on subjects such as the collective behavior of animals and people, the mathematics of medical imaging, quantum computing, and the changing nature of mathematical proof.

The 2014 meeting will be February 13–17, 2014 in Chicago, and the Steering Committee for Section A seeks organizers and speakers who can present substantial new material in an accessible manner to a large scientific audience. All are invited to attend the Section A Committee business meeting in Boston on Friday, February 15, 2013, at 7:00 PM, where we will brainstorm ideas for symposia. In addition, I invite you to send me, and encourage your colleagues to send me, ideas for future AAAS annual meeting symposia.

The following are the members of the Steering Committee for Section A from February 2012 to February 2013:

Chair: Jill Mesirov (Broad Institute of MIT and Harvard)
Chair-Elect: Juan Meza (University of California, Merced)
Retiring Chair: John H. Ewing (Math for America)
Secretary: Edward Aboufadel (Grand Valley State University)
Members at Large:
Tony Chan (Hong Kong University of Science and Technology)
Mary Ellen Bock (Purdue University)
Joceline Lega (University of Arizona)
Sheldon Katz (University of Illinois, Urbana-Champaign)

IISSAM 2013

Jackie Dewar, Professor of Mathematics, Loyola Marymount University

"The purpose of a storyteller is not to tell you how to think, but to give you questions to think upon."

Brandon Swanson, *The Way of Kings*

The scholarship of teaching and learning (SoTL) movement (Boyer, 1990) invites faculty to view their classrooms as sites for inquiry. Questions about teaching or problems with students' learning become invitations for faculty to investigate these in a scholarly way. The Carnegie Foundation for the Advancement in Teaching was a leading proponent and supporter of SoTL from 1998–2009, with separate programs aimed at mentoring individual SoTL scholars and garnering support from professional societies (including the MAA) and institutions of higher education. An overview of this work, "Scholarship of Teaching and Learning: What? Why Now?" containing examples and resources for carrying out SoTL in mathematics appeared in the November–December 2007 issue of this newsletter (Dewar, 2007). Recent

contributed paper sessions addressing SoTL and Project NExT panels discussing the topic at the Joint Math Meetings indicate strong interest in SoTL among mathematics faculty.

The International Institute for SoTL Scholars and Mentors (IISSAM) offers a SoTL mentoring experience modeled after the one developed by Carnegie. The heart of the Institute is a process of mentoring work-in-progress by providing feedback and support to small groups of scholars with an assigned mentor. The next IISSAM will be held May 30 – June 2, 2013 at Loyola Marymount University in Los Angeles, CA. This year's theme, Storytelling, invites participants from all disciplines to explore how stories can convey meanings and enhance abstract concepts, how courses tell a story and can be constructed like a story, how SoTL research projects unfold like stories, and much more.

Individuals or teams may propose a project to be mentored, they may present a poster on a project, or they may attend to learn about SoTL and/or to share ideas and suggestions with other SoTL scholars at IISSAM 2013. Visit the IISSAM website (http://www.iissam.org) for the latest details about the Institute and the submission process. Deadline for scholar proposals is **February 1, 2013**, for poster submission is **April 19, 2013**, and for registration is **May 10, 2013**.

Boyer, E. L. (1990). *Scholarship reconsidered: Priorities of the professoriate*. San Francisco, CA: Jossey-Bass.

Dewar, J. (2007, November–December). Scholarship of teaching and learning: What? Why now? *AWM Newsletter* (36) 6, 26–28.

An Imaginary Interview with Dame Kathleen Ollerenshaw

Evelyn Lamb

Note: Portions of this article appeared in a different form on the Scientific American *website. The Ollerenshaw portions of the article are reprinted from* To Talk of Many Things *by Kathleen Ollerenshaw, ©2004, by permission of the publisher, Manchester University Press.*

Dame Kathleen Ollerenshaw turned 100 on October 1, 2012. Born in Manchester, England, she earned her doctorate in mathematics at Oxford during World War II after her husband went off to serve. She worked as a mathematics instructor part time while raising her children and eventually moved into politics. She started in a local education committee and worked her way up to a position in Margaret Thatcher's administration.

Although she did not have a typical research career by today's standards, mathematics is ever-present in Ollerenshaw's life. She clearly has an extremely gifted mathematical mind, but mathematics does not define her. Her friend Terry Edwards wrote to me in an email, "This seems to mark out many of her generation, the ability to turn their hands to many tasks and take on numerous roles. I do not think that Dame Kathleen would have been suited to become an industrial mathematician or hold a university post. Had she been born much later, I think her life might have been channeled down a narrow route—like the rest of us." Edwards says that Ollerenshaw is still very active for her age, participating in social and cultural events and doing mathematics in her spare time.

Ollerenshaw's strength, energy, and perseverance touched me deeply while I was working on an article about her for Scientific American *last summer, and I hoped to share her story in her own words. Unfortunately, her vision and hearing limitations and location on the opposite side of an ocean from me meant that I could not speak with her directly. Instead, I offer this imaginary interview using quotes from her 2004 autobiography* To Talk of Many Things. *No words have been altered, but in some "responses" I have combined non-consecutive statements without using ellipses.*

EL: At age eight, after a chilly summer vacation, you caught a severe cold and lost your hearing. How did that influence your study of mathematics?

KO: I was probably somewhat deaf before that disastrous holiday. This may have accounted for my early preference for playing with numbers instead of words, which I may never have heard accurately. What is certain is that mathematics and the passion for numbers came into its own and intensified as I progressed through school, partly because I could not hear properly. This was the one subject in which I was at no disadvantage. Mathematics became my life-line as well as an ever-increasing source of joy.

EL: You faced some discrimination on account of being deaf.

KO: [In boarding school] it was pointed out that there was no future employment for a girl in mathematics other than in teaching and, as being deaf ruled out teaching,

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I should choose some other subject. I went berserk. I heard myself saying that it was mathematics and only mathematics that I wanted to do, that if mathematics was barred then I would write to my parents and demand to be allowed to leave school immediately. A compromise was reached: I was allowed to join the mathematics sixth form "for the first half of the term." Nothing more was ever heard again about my not specializing in mathematics. The strength of my emotion had surprised everyone—even me.

At the interview [to gain admittance to] Cambridge, I came unstuck. No one knew I was deaf. I was not able to lip-read my key interviewer and made the fatal mistake when leaving the room of telling someone that I had not heard a word that had been said. An exhibition [a lower honor than a scholarship] was offered me at Newnham reluctantly, because it was considered that deafness would be too much of a handicap to overcome. At Oxford a few days later there was better luck. I was more careful and cunning, and they never found out about the deafness until I came back six months later in October [after being awarded a scholarship].

The prejudice against the deaf was considerable. There is more understanding nowadays and help for all handicaps. Then, the deaf were classed as either stupid or inattentive or even just rude when we did not respond politely to (unheard) greetings or questions.

EL: While you were at boarding school, you developed a technique you call "subliminal learning" that seems to have saved you a lot of time!

KO: I would make certain to sort out in my head, as late as possible, what problems needed to be solved the next day and what might be usefully committed to memory. Before falling asleep, I "drew" with my finger any relevant geometrical figure or algebraic equation on the partitioning of the dormitory cubicle that formed a bedside wall. The result would be miraculous. Without fail, on waking in the morning, the details, the logical argument required or the facts that I needed to recall were clearly imprinted in my mind and, because of the clarity, any required solution would often be clearly "written" on the partition. This became honed to a fine art, without my ever telling anyone, and I have used the technique deliberately ever since. It works equally well in a train sleeper, in aircraft or on any long journey.

EL: How did you meet your husband?

KO: Robert, my husband to be and the elder of two brothers, was born four months before me and lived in a house about half-way between our house and the school. My route to school took me past his house and we walked there together. I have a snapshot taken on 17 June 1919 at his 7th birthday party. He has his arm around my shoulder as if I was the only girl in the world.

In my first term [at Oxford] Robert invited me to go with him to a dance at St. Hilda's College. I think we both knew this would be the occasion when he would "pop the question." And he did. On Saturday evening, 14 November 1931, in bright moonlight among the cabbages of St. Hilda's kitchen garden, Robert asked me to marry him. The reply was a firm "Yes" and we had our first real kiss, despite having been devoted friends since we were both aged six. Throughout the years that followed, until Robert died in 1986 aged 74, we always celebrated this special day, 14 November, rather than our actual wedding day of 6 September 1939 in the first week of the war.

EL: When World War II started, you were on vacation in Austria with your father-in-law, as you had done for several years. How did you get back and end up getting married so quickly?

KO: These were August holidays, when we did our best to keep free from political anxieties and evidence of the developing power of Adolf Hitler. We hoped against hope that things would not come to the ultimate crisis. [Robert's father] refused to give up the idea of holidaying in St. Gilgen [their customary destination]. Our Viennese friends remained in Vienna and warned us not to come to Austria, but we went just the same. Hitler had moved into Czechoslovakia and the threat to peace became increasingly plain. We must have been mad to go there.

By the middle of August Robert, in Manchester, was going berserk. He had already been called up and knew war was imminent. He started sending urgent telegrams to us in St. Gilgen, none of which we received. It was the owner of the boatyard in St. Gilgen who told us to leave the next day if we didn't want to risk being interned. We left that night, stopped at Innsbruck and pressed on via Zürich to France. We were obliged to leave the Buick and our luggage behind and take a passenger ferry across to Southampton. During the crossing an aeroplane came down in the sea near us and we stopped to rescue the pilot—our first taste of the war.

If I had expected a warm welcome on arriving home from St Gilgen on 3 September 1939, I was much mistaken. A furious Robert was on the station platform. Why the dickens hadn't we reacted to his telegrams and come home as fast as we could a fortnight before? My parents were in an equal rage. My only thought was getting to St. James's Church in Didsbury and being married. I took it for granted that Robert would be posted abroad immediately—and be slaughtered in northern France as had happened to so

many soldiers. I dreaded being left unmarried after so long betrothed.

Although Robert had several embarkation leaves, he remained in England for over three years. Robert's sixth embarkation leave was "for real." After about three weeks knowing nothing, I received a delayed letter from him headed "At sea." He was writing from mid-Atlantic on a circuitous voyage with his field ambulance on his way to the Mediterranean and North Africa. The shock on receiving this letter was so great that I promptly had a miscarriage. I cried non-stop for three days and then picked myself up and took the tramcar to the University to see how I could best use my mathematics (notwithstanding being deaf) to help in the war effort.

EL: You continued to teach mathematics part-time following the war while raising your children. Shortly after you got your first hearing aid, you entered politics.

KO: In May 1954 a Conservative co-opted member of the Manchester education committee died. I was asked if I was prepared to be nominated to fill this vacancy on the education committee. I was astonished and delighted and accepted without hesitation. To serve on the Manchester education committee seemed an ideal way of giving the public service that I had been brought up to believe should be a main objective for those not obliged to earn their own living. I had no other positive plans, the deafness until so recently having ruled out most possibilities.

Robert's attitude, at least in the first years when I was on the city council, was a tolerant acceptance, glad that I was happily occupied and making few demands on him. When I became the chairman of the education committee and sometimes, inevitably, became the object of media flak, he did not like this one bit, and certainly gave no sympathy. "If you will get involved in politics, then that is your fault." His attitude changed substantially for the better when a senior army officer, visiting his Field Ambulance, asked him if his wife was Kathleen Ollerenshaw, the Manchester educationist.

EL: You were eventually made a Dame, but the announcement was tinged with grief.

KO: In June 1970, our daughter Florence, by now a teacher at a school in London, had an emergency operation for appendicitis. I went to London to be near her, waiting with increasing anxiety when she was far longer than anticipated in the operating theatre. They had found cancer. This devastating news was confirmed after tests and conveyed to us a few days later—coinciding exactly with a confidential letter telling me that I was to be awarded a Dame Commander of the British Empire "for services to education." Two further major surgical operations followed over the next eighteen months. Each operation gave Florence hope and bolstered her morale, but Robert and I both knew what was to come. She died at home at the end of October 1972, aged 26.

EL: How did you get through that time?

KO: Robert and I had a wonderful married life. Being together was the greatest help to us both after Florence had died. If he had a fit of depression, I prepared a special treat meal so that he could recover. If it was I who became distressed, he became deliberately tough and forced me to get back on track. We missed our 50th wedding anniversary by only three years, but we had been blessed with over seventy years, almost always together, apart from his service in the war.

EL: After Robert's death, you dived into astronomy with fervor, even traveling across the world to view a total solar eclipse when you were almost 80.

KO: I arranged to go to Hawaii in July 1991 for the "Big One" that had the almost maximum duration of nearly eight minutes. We were allocated the eastern side [of the "Big Island"] and drove in rather rickety yellow American school buses up toward the telescopes on the top of Mauna Kea, an extinct volcano with a height of 14,000 ft. It was raining solidly. To our annoyance we were stopped for undisclosed reasons at a barrier at a mere 3,000 ft. As the time of the first phase of the eclipse approached, our buses parked along the road, I had a fixation that I must get as high as possible. I grabbed my tripod and camera and clambered up a steep bracken-covered slope until at last I came to a level spot and set up my gear. I watched with growing gloom as a watery and sometimes almost non-existent sun revealed its presence dimly through what had turned from heavy rain to thick drizzle. Then, lo, there appeared a patch of pale blue sky. There was a great shout. At the crucial moment of the onset of totality the clear patch coincided with the sun and moon. The few of us on the hillside witnessed it all.

EL: What are magic squares, and how did you start working on them?

KO: A magic square is an array of whole numbers in which the numbers in each row, in each column and in the two principal diagonals add to the same total, called the "magic constant." A 4x4 square is said to be "of order 4," a 5x5 square, "of order 5," and so on. The interest is when the numbers are consecutive: the square is then called "normal." In a normal square of order 4 the numbers can be taken as 1 to 16 with the magic constant then 34, or sometimes more conveniently as 0 to 15 with the magic constant then 30. Over 300 years ago, a French civil servant and amateur

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mathematician, Bernard Frénicle de Bessey (1602–76) established that there are 880 and only 880 "essentially different" normal 4x4 magic squares. I was curious about this total of 880. A better guess might have been 864 which is 32x27 or 2^5x3^3 and so can be tidily expressed in powers of 2 and 3. Where did the "extra" 16 squares come from to give a total of 880? I was doodling with this during some meeting, as was my habit when a meeting became boring or when I couldn't hear properly what was being said. My scribbles caught the attention of Sir Hermann Bondi who was sitting next to me. The outcome was that we collaborated in devising the first (and still the only) analytical proof of Frénicle's counting, which he had arrived at by considering all possibilities, a method known as "exhaustion," not by logic alone.

About a year later, Sir Hermann received a letter from an electrical engineer. He wrote from hospital and he died before any of the consequences of his letter had materialised. In essence, he had found that he could use a certain type of magic square called pandiagonal [the "broken" diagonals of the square, which wrap around from one edge to the opposite edge, also add up to the magic constant] of order 8 in a process known as dither printing sometimes used for fast production of pictures in newspapers. He wanted to know how to construct pandiagonal magic squares of order 16 as this would then give a finer mesh for the dither process and better results. He sought our help. This was a challenge I could not resist. I worked out not only how to construct [magic squares of a type called most-perfect] but how to enumerate the totals that could be constructed, firstly for when they are of a size that is any power of 2, namely 4, 8, 16, 32 … to infinity, finally, a formula for the total number of all most-perfect magic squares of any order which is a multiple of four. This was the first time in all the thousands of years during which magic squares have fascinated mathematicians and laymen alike, that a method of construction had been found for a whole class.

EL: Do you have any advice for mathematicians who are just starting out?

KO: New problems tend to "turn up," often by chance. We notice some phenomenon and this triggers the question—why?

How are problems solved? Sometimes directly, but usually by having "bright ideas" and experimenting to see if they fill the bill. We rarely work smoothly through to the end, but tend to jump about. We establish an hypothesis, a tentative objective or guessed answer, often working backwards for a certain distance: "if that is so, then what would have been the immediate preceding stage in the proof that led up to it?" This narrows the gap between what we have deduced from the data and what we have conjectured. Intuition and experience sometimes then cause the spark that fills the gap and clinches the proof. In original research there is often the difficulty that one does not know if there is an answer, let alone what it may be. Genius lies in perceiving and correctly annunciating the conjecture in the first place. This has to be supported by proof, that may again require genius, perhaps also the invention of new methods and, then, new notations with which to convey the methods to others.

An interesting feature of much mathematical research is that the moment when the critical idea that leads to a solution flashes into the consciousness is almost always absolutely specific and can be recalled at will. We carry some problems in our heads all the time—sometimes even for months or years while dealing with other problems or coping with the daily grind. There is no predicting when (or if) this critical moment may occur. Once it happened to me disconcertingly when stepping onto a bus. On another occasion, after spending two days at a boring conference and making an equally boring long drive home alone, I was turning the key to our front door when the answer to a problem I had been pondering suddenly appeared. I ran into the house, saying to Robert, "Sorry, darling, I'm on heat with an idea. Please get something to eat yourself. I must go and write it down before it slips away."

EL: Mathematics has been much more to you than a profession. You describe it as a refuge and a joy in your life.

KO: One secret of finding a happy life, I would aver, is that talent shown when young, however esoteric, should be nurtured and never wholly neglected. If we live beyond the average life expectancy, we lose some of the friends and relatives we treasure most. In times of trouble we need all the resources we can muster to fall back on. My great good fortune was that I had this mathematics. With no high aspirations or ambition, I have been able to turn to it repeatedly when events have gone against me. Everything else has seemed, in retrospect, to have been ephemeral in comparison. When I have needed solace and I have had to depend on my own resources, the mathematics has been there. I am grateful.

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THE UNIVERSITY OF OKLAHOMA — Department of Mathematics — Applications are invited for one full-time, tenure-track position at the assistant professor level in mathematics beginning 16 August 2013. Normal duties consist of teaching two courses per semester, conducting research, and rendering service to the Department, University, and profession at a level appropriate to the faculty member's experience. The position requires an earned doctorate and research interests that are compatible with those of the existing faculty; preference will be given to applicants with potential or demonstrated excellence in research and prior successful undergraduate teaching experience. Salary and benefits are competitive. For full consideration, applicants should send a completed AMS cover sheet, curriculum vitae, a description of current and planned research, and have three letters of recommendation (at least one of which must address the applicant's teaching experience and proficiency) sent to: Search Committee, Department of Mathematics, The University of Oklahoma, 601 Elm, PHSC 423, Norman, OK 73019-0315, Phone: 405-325-6711, FAX: 405-325-7484, E-mail: mathsearch@math.ou.edu. *Applications may also be submitted online through https://www.mathjobs.org/jobs/jobs/4157. Screening of applications will begin on **November 15, 2012** and will continue until the position is filled. **The University of Oklahoma is an Equal Opportunity/Affirmative Action Employer. Women and Minorities are Encouraged to Apply.**

THE UNIVERSITY OF OKLAHOMA — Department of Mathematics — Applications are invited for one full-time, tenure-track assistant professor position in Mathematics Education beginning August 16, 2013. Normal duties consist of teaching two courses per semester, conducting research, and rendering service to the Department, University, and profession at a level appropriate to the faculty member's experience. The position requires an earned doctorate in Mathematics or in Education with a Mathematics specialization. A strong background in Mathematics beyond the Master's level is also required. The Mathematics Department at the University of Oklahoma offers a Doctoral Degree in Research in Undergraduate Mathematics Education. Candidates should be capable of directing doctoral students and contributing leadership to this program. Responsibilities will include involvement with undergraduate Mathematics courses and with both undergraduate and graduate courses in Mathematics Education. Preference will be given to those whose research interests are compatible with those of existing faculty. Salary and benefits are competitive. For full consideration, applicants should send a completed AMS cover sheet, curriculum vitae, a description of current and planned research, and have three letters of recommendation (at least one of which must address the applicant's teaching experience and proficiency) sent to: Search Committee, Department of Mathematics, The University of Oklahoma, 601 Elm Avenue, PHSC 423, Norman, OK 73019-0315, Phone: 405-325-6711, FAX: 405-325-7484, E-mail: search@math.ou.edu. *Applications may also be submitted online through https://www.mathjobs.org/jobs/jobs/4156 Screening of applications will begin on **November 15, 2012** and will continue until the position is filled. **The University of Oklahoma is an Equal Opportunity/Affirmative Action Employer. Women and Minorities are Encouraged to Apply.**

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