ASSOCIATION FOR WOMEN IN MATHEMATICS

# Newsletter

VOLUME 43, NO. 6 • NOVEMBER–DECEMBER 2013

**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

As usual, summer flew by all too quickly. Fall term is now in full swing, and AWM is buzzing with activity.

**Advisory Board.** The big news this fall is the initiation of an AWM Advisory Board. The Advisory Board, first envisioned under Georgia Benkart's presidency, consists of a diverse group of individuals in mathematics and related disciplines with distinguished careers in academia, industry, or government. Through their insights, breadth of experience, and connections with broad segments of the mathematical community, the Board will seek to increase the effectiveness of AWM, help with fundraising, and contribute to a forward-looking vision for the organization.

Members of the Board were selected to represent a broad spectrum of academia and industry. Some have a long history with AWM, and others are new to the organization; all are committed to forwarding our goals. We are pleased to welcome the following Board members:

Mary Gray, Chair (American University)
Jennifer Chayes (Microsoft Research)
Nancy Koppel (Boston University)
Irwin Kra (Stony Brook University)
Joan Leitzel (University of New Hampshire, Ohio State University)
Jill Mesirov (Broad Institute)
Linda Ness (Applied Communication Sciences)
Richard Schaar (Texas Instruments)
Mary Spilker (Pfizer)
Jessica Staddon (Google)

In addition, the President, Past President (or President Elect) and Executive Director of AWM are also members of the Board. Short biographies of the board members are available on our website. I look forward to working with this outstanding group.

**Meetings.** After a full program of events at the SIAM meeting in July, AWM concluded its summer activities in August with a lecture and panel at **MathFest 2013**. The AWM-MAA Etta Z. Falconer Lecture was presented by Patricia Kenschaft, Professor Emerita at Montclair State University. Kenschaft's talk, entitled "Improving Equity and Education: Why and How," was a highly entertaining and thought-provoking look at her efforts to improve mathematics education at the

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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*

elementary school level. The AWM panel, "Successful Career Transitions," included five panelists, Lynette Boos (Providence College), Eileen Lee (Math for America), Connie Leidy (Wesleyan University), Karen Ricciardi (University of Massachusetts Boston), and Milena Tzigantcheva (State Street Corporation). Each panelist discussed a key transition point in her career, ranging from starting a tenure-track job, to becoming a mother, to moving from academia to a career in industry or the non-profit sector. All offered useful insights into navigating these transitions.

Plans are well under way for a full program of AWM events at the **Joint Mathematics Meetings** in Baltimore, January 15–18. Activities planned for the JMM include the opening reception, the AWM Noether Lecture, a career panel, a research workshop and a poster session. Of particular interest this year is the annual AWM Reception, which takes place Wednesday evening following the Gibbs Lecture. In addition to the usual opportunity to eat, drink, and network, this year's reception will feature a presentation of two new AWM research prizes. The AWM Sadosky Prize in Analysis will be awarded to Svitlana Mayboroda (University of Minnesota) and the AWM Microsoft Prize in Algebra and Number Theory will be awarded to Sophie Morel (Princeton University). In addition, we will present the 2014 AWM Service Awards and introduce the winner, runner-up and honorable mentions for the Alice T. Schafer Prize for excellence in mathematics by an undergraduate woman. *If you are attending the JMM this year, be sure to join us at the reception to honor these outstanding prize recipients.*

The panel discussion on Wednesday afternoon, organized by Bettye Anne Case (Florida State University) and Christina Sormani (City University of New York), will focus on "Building a Research Career in Mathematics." Panelists from a wide range of institutions will provide insight into building a research career in a variety of environments. The discussion should be useful to department chairs interested in helping their junior faculty to succeed, as well as to the junior faculty themselves.

Thursday morning, the annual Noether Lecture will be given by Georgia Benkart (University of Wisconsin-Madison). The Noether Lectureship was created to honor women who have made fundamental and sustained contributions to the mathematical sciences. In addition to serving as AWM President from 2009–11, Benkart has had a distinguished research career in algebraic combinatorics. Her talk is entitled "Walking on graphs the representation theory way." (See the press release later in this newsletter for more details.) A joint AMS-AWM special session on Geometric Applications of Algebraic Combinatorics is planned in connection with the Noether Lecture.

The AWM-JMM workshop for early career mathematicians, funded by the National Science Foundation, is organized this year by Maria Basterra (University of New Hampshire), Erin Chambers (Saint Louis University), and Kathryn Leonard (California State University Channel Islands). The workshop will begin with a poster session and reception on Friday evening and continue all day Saturday with a series of talks focused on image analysis, computational geometry, and computer vision.

We hope to see many of you in Baltimore in January. If there are breaks in your JMM schedule, we would appreciate volunteers to help staff the AWM booth in the exhibit hall. Please contact Magnhild Lien at mlien@awm-math.org to sign up. For the schedule of AWM events at JMM, see http://jointmathematicsmeetings.org/meetings/national/jmm2014/2160_otherorg.

**Other news.** The list of invited speakers for the next **International Congress of Mathematics**, ICM 2014, is now available. The plenary speakers include two women, Maryam Mirzakhani (Stanford) and Vera Serganova (University of California, Berkeley). Mirzakhani was one of the plenary speakers at the AWM Research Symposium 2013 in Santa Clara last March. In addition, close to 15% of the sectional speakers are women, including our own Past President, Jill Pipher. Congratulations to Maryam, Vera, Jill, and all of the invited speakers!

Nominations will soon be open for the inaugural **AWM Joan and Joseph Birman Prize in Topology and Geometry**, to be awarded at JMM 2015. The current three AWM research prizes, the Birman prize, the Sadosky prize, and the Microsoft prize, are aimed at highlighting and promoting outstanding women in the early stages of their career. To be eligible, a woman must be either untenured or within 10 years of receiving her PhD at the time of the nomination deadline. We are eager to add a fourth research prize, the [your name here] Prize in Applied Mathematics. For information on funding a prize, contact the AWM office.

In other news, through the efforts of Heather Russell (Washington College) and Kathleen Fowler (Clarkson University), AWM has instituted a **Student Chapter Speaker Program**. Under this program, AWM solicits volunteers to give math talks to student chapters in their area. If you are interested in volunteering, please see the link to the Student Chapter Speaker Program on our website. This is a wonderful opportunity to support local AWM student chapters and to connect with undergraduate women in your geographic area.

On a sadder note, I recently learned of the passing of Lesley Sibner. Sibner earned her degree from the Courant Institute in 1964 and spent most of her career at the Brooklyn Polytechnic Institute. Her outstanding work in geometry and global analysis earned her numerous honors including her selection as AWM Noether Lecturer in 1994 and as a Fellow of the American Mathematical Society in 2012. Our condolences go to her friends and family.

Finally, I would like to take this opportunity to welcome Jackie Dewar as Education Column Editor for the *Newsletter*. Jackie has been part of the newsletter team for some time, but is now taking on this extra responsibility. The work of the newsletter team, especially longtime editor Anne Leggett, is invaluable to the organization. We cannot thank them enough.

You will soon be receiving an invitation to vote for new members of the AWM Executive Committee, including the next AWM President. Information about the candidates can be found later in this newsletter.

In closing, let me remind you that the AWM membership year began on October 1. If you have not already done so, *please renew your membership now* and consider adding a contribution of any size. Every membership and every contribution counts!

Ruth Charney

Ruth Charney
Waltham, MA
September 24, 2013

*Ruth Charney*

**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.

**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 queries/material for columns to Anne Leggett, leggett@member.ams.org. 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.

ASSOCIATION FOR WOMEN IN MATHEMATICS

## AWM ONLINE

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

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

## AWM DEADLINES

AWM Election: December 15, 2013

AWM Travel Grants:
February 1, 2014 and May 1, 2014

AWM Essay Contest:
January 31, 2014

AWM Mentoring Travel Grants:
February 1, 2014

AWM-Birman Research Prize:
February 15, 2014

AWM Louise Hay Award:
April 30, 2014

AWM Humphreys Award:
April 30, 2014

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# AWM Election

This year, we are electing a President-Elect, a Clerk, and four Members-at-Large of the Executive Committee. The Member-at-Large positions are contested, so we encourage you to vote. Statements, biographical data, and photos provided by the candidates follow. Those elected will take office on February 1, 2014.

You will receive an email inviting you to vote on November 15, 2013. At that time the electronic ballot link (www.awm-math.org/ballot.htm) will be activated. You will be asked to provide your membership number when you vote; this number will be included in the email that you receive. Also, a ballot is included on page 21 of this issue, for those who prefer to vote the old-fashioned way. A validating signature is required on the envelope if you vote via paper ballot. Institutional, affiliate, and corporate memberships do not carry voting privileges. Electronic ballots must be cast by **December 15, 2013**, which is also the due date for paper ballots.

## PRESIDENT-ELECT

### Kristin Lauter, Microsoft Research

***Statement:*** I have been involved with the AWM since graduate school and it is an honor to be nominated as President. My research and career has benefitted from the support of AWM through mentoring and travel grants and the AWM Workshop at the JMM. I have been inspired by the work of AWM over the last four decades and all that has been accomplished to support the participation and success of girls and women in mathematics. I look forward to continuing to serve and build the organization.

My vision is to help create community and collaboration networks for female researchers in mathematics at all stages of their research careers. I believe this is the best way to increase the representation of women on the mathematics faculties at our top universities, which in turn will help to increase the number of women trained for research careers in mathematics. For the 40th anniversary of AWM, I was privileged to co-organize the AWM 40th Anniversary Conference at Brown University with Jill Pipher and Georgia Benkart. This conference brought together more than 300 female researchers from around the world, with 18 special sessions and 4 plenary talks. The enthusiasm at the conference was palpable, and so a new series of Biennial Research Symposia was launched, and the second conference took place in Santa Clara this year with similar success. In 2008, I co-founded the WIN network (Women in Numbers) to build and promote a network of female researchers in number theory. Running the first WIN conference at BIRS, we

formed working groups to address open research questions. The topics were chosen by several senior leaders in each group, and two to four graduate students or junior faculty were assigned to each topic. Again the enthusiasm and energy of the participants was overwhelming, and many have stepped forward to help build the WIN network and organize subsequent conferences and events. The Fields Institute published the volume of research and survey articles which came out of the first WIN conference, and collaborations arising from those projects continue. The proceedings from WIN2 (2011) were published by CRM/AMS, and WIN3 will take place at Banff in 2014. Since then we have encouraged the expansion of this model to other areas of mathematics, with great success. Recent collaborative research workshops for women at BIRS, IPAM, and IMA have taken place in algebraic combinatorics, algebraic topology, mathematical modeling and applied mathematics. The AWM has recently launched a new model for its annual workshops, focused on a single research topic each year, and in tandem has signed a publication contract with Springer to publish a coherent series of proceedings volumes linked to these collaboration workshops and related AWM workshops and conferences. This past year I also co-organized a regional research conference for women, WiMSoCal, a 1-day research conference for women in Southern California which has run for the last 5 years. I would like to encourage the development of an active network of regional math research conferences for women, as a way to support female mathematicians and graduate students in their local environments.

I would also like to help increase awareness in the mathematics community of opportunities for rewarding research careers in mathematics in industry. I am active in both AMS and SIAM to help promote an expansion of career options for research mathematicians, and I believe AWM can play a valuable role in helping to connect talented young women with rewarding career paths. I plan to work together with other leading organizations for women in science, including the ACM and CRA-W in Computer Science and NCWIT and the Anita Borg Institute to promote the advancement of girls and women in technical careers, where mathematics can play an important role. AWM has a rich history and record of accomplishments, and I look forward to working together to build on these accomplishments and expand its influence in new directions.

***Biographical Information:*** Kristin Lauter is a Principal Researcher, Research Manager of the Cryptography Research Group at Microsoft Research in Redmond, Washington, and an Affiliate Professor at the University of Washington. Her research focuses on number theory and algebraic geometry, with applications to cryptography and coding theory. Lauter received her BA, MS, and PhD degrees in mathematics from the University of Chicago, in 1990, 1991, and 1996,

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CALL FOR NOMINATIONS

## 2015 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, 2014** 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.

respectively. Prior to joining Microsoft Research, she held positions as T.H. Hildebrandt Research Assistant Professor at the University of Michigan (1996–1999), a Visiting Scholar at Max-Planck-Institut für Mathematik in Bonn, Germany (1997), and a Visiting Researcher at the Institut de Mathématiques Luminy in France (1999). From 2010–2013 she was a member of the Senior Leadership Team for the Microsoft Research XCG Lab.

Lauter has published extensively in mathematics and computer science, with over 50 published research articles and 3 edited volumes. In 2008, Lauter, together with her co-authors, was awarded the Selfridge Prize in Computational Number Theory. Her research has been covered in scientific publications such as *Science, American Scientist,* and *Technology Review*. Lauter has recently given an Invited Address at the SIAM Annual Meeting and has given Invited Addresses at regional meetings of the AMS and MAA. She has served on the Executive Committee of the Association for Women in Mathematics and on the editorial boards for *Journal of Algebra and Its Applications* and *International Journal of Information and Coding Theory*. She has served as Program Chair and on the Program Committee for many cryptography conferences in computer science, and she serves on the Advisory Board for SHARPS, the Strategic Healthcare IT Advanced Research Projects on Security. She is an active member of AMS, SIAM, and AAAS.

## CLERK

### Janet Beery, University of Redlands

***Statement:*** I am pleased and honored to be nominated as Clerk of AWM. I remember receiving my first AWM newsletters as a new faculty member during the early 1990s and being educated, encouraged, and inspired by the stories of Dusa McDuff, Susan Landau, and Cora Sadosky, among many others. (Landau had given an especially memorable talk at Dartmouth College, when I was a graduate student there, but the most memorable mathematical talk I ever heard was given during my undergraduate years at the University of Puget Sound by the first woman mathematician I ever met, Gloria Hewitt.) I am grateful to be given this chance to give back to an organization that has paved the way for my success in a mathematical career and for that of increasingly many other women who love mathematics.

As AWM Clerk and member of the AWM Executive Committee, I hope to assist with AWM planning and projects of all sorts and, in particular, to help AWM continue to become more responsive and helpful to women mathematicians with positions in more teaching-intensive colleges and universities and/or with scholarly interests in areas that may lie outside the mainstream of mathematical research, such as mathematics history, philosophy, and education.

***Biographical Information:*** Janet Beery is Professor of Mathematics at the University of Redlands, where she has been a faculty member since 1989, the year she received her PhD in group theory from Dartmouth College. In 1996 she became interested in teaching mathematics history and, by early this century, had become a researcher in that field, specializing in the history of early modern British mathematics. She has been editor of *Convergence*, the MAA's online journal on the history of mathematics and its use in teaching, since 2009. She has served the MAA in a number of ways and received its Meritorious Service Award in 2010. From 2002 to 2008 she was a member of the College Board AP Calculus Examination Development Committee, serving as College Board Advisor from 2006 to 2008. She currently serves on the AWM Essay Contest Committee, which she has found to be some of her most delightful committee service ever!

## MEMBER-AT-LARGE

### Alissa S. Crans, Loyola Marymount University

***Statement:*** The AWM has played an invaluable role in my mathematical life at various critical stages of my career. Participating in the AWM Workshop at the JMM both as a graduate student and as a recent PhD provided me with the opportunity to make numerous connections with senior women and peers who continue to be my role models, collaborators, and mentors. Additionally, receiving a Travel Grant enabled me to attend a major conference in my field as a fresh

PhD and meet the key researchers in my area, with whom I was able to discuss the work from my dissertation. Thus, it is truly a pleasure and honor to be considered to serve on the AWM Executive Committee as a Member-at-Large.

I am dedicated to broadening participation and increasing inclusivity in the mathematical community. Through my involvement with the AWM Workshop Committee, SMP, EDGE, SPWM, and WiMS, I am able to encourage and mentor women at all stages of their education and professional lives. As a member of the Executive Committee, I would enthusiastically support and promote the current AWM programs and opportunities, including the AWM Workshop at the JMM, Travel Grants, Mentor Network, SK Days, Essay Contest, and the various awards. I would enjoy working with all of you to strengthen and grow these programs as well as consider ideas for new AWM initiatives.

***Biographical Information:*** Alissa S. Crans earned her BS in mathematics from the University of Redlands and PhD in mathematics from the University of California at Riverside. She is currently an Associate Professor of Mathematics at Loyola Marymount University and the Associate Director for Diversity and Education at MSRI. Alissa's research interests include quantum algebra, geometric topology, and connections between mathematics and music.

Alissa has extensive experience mentoring and supporting women mathematicians through her involvement in the Summer Mathematics Program (SMP) at Carleton College and teaching in the Enhancing Diversity in Graduate Education (EDGE) program and the Summer Program for Women in Mathematics (SPWM) at George Washington University. She is also a co-organizer of the Southern California Women in Mathematics Symposium (WiMS) and the Graduate Education Mentoring (GEM) Workshop and has served on the AWM Workshop Committee. She is a recipient of the Mathematical Association of America's 2011 Merten M. Hasse Prize for expository writing and 2011 Henry L. Alder Award for distinguished teaching by a beginning college/university mathematics faculty member.

## Rachelle DeCoste, Wheaton College (MA)

***Statement:*** I am honored to have been nominated to run for a Member-at-Large position on the AWM Executive Committee. I have previously served on the AWM JMM Workshop Committee, and I look forward to the opportunity to contribute to the future of the AWM if elected to the Executive Committee. This is an important time for women in mathematics and for the AWM as many think that programs exclusively for women are no longer necessary. I know from my many interactions with underrepresented members of our community, that sadly that is not yet true. Members of the larger mathematics community look to organizations such as the AWM for strong leadership and commitment to supporting women in all types of careers in mathematics. Through my participation in the AWM Executive Committee, I aim to strengthen the reach and impact of the AWM to help ensure 40 more years of productive impact on the math community.

Since beginning my graduate career I have been actively involved with various organizations supporting women and underrepresented minorities in mathematics. I was a participant in the first year of the EDGE (Enhancing Diversity in Graduate Education) Program and later a graduate mentor for that program. I am the founder and director of CaMeW, the Career Mentoring Workshop for women in mathematics. Through this program we have mentored over 60 women at the beginning of their postdoctoral careers. The network of women that has resulted from this program, including participants and faculty whom I have recruited to work with the program, is one of my proudest professional accomplishments.

***Biographical Information:*** Rachelle DeCoste is an Assistant Professor in the Mathematics and Computer Science Department of Wheaton College (MA) where she engages in all the activities typical of faculty at a small liberal arts college. She researches geometric properties of manifolds

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arising from 2-step nilpotent Lie groups. She also regularly encourages student participation in mathematics outside of the classroom by organizing teas and seminars on campus and taking students to events such as Smith's WIMIN conference. Rachelle, an active member of the mathematics community, was a Project NExT fellow, has organized an AMS Special Session and is currently serving on the program committee for her local MAA section meeting and the AMS Committee on the Profession. Prior to her arrival at Wheaton she was an Assistant Professor at the United States Military Academy at West Point. She earned a BA in mathematics from Connecticut College in 1997 and an MS and PhD in mathematics from the University of North Carolina, Chapel Hill in 2000 and 2004, respectively.

### Joan Ferrini-Mundy, National Science Foundation

***Statement:*** I am pleased to be nominated to be a member-at-large of the executive committee of the Association for Women in Mathematics. In its more than 40 years the AWM has been a constant and effective source of advocacy, support, and resources for encouraging women to pursue mathematics. This advocacy, support, and resources are still greatly needed in encouraging new generations of women in the mathematical sciences. My earliest research interest was in women's learning of calculus, and in the intervening years I have maintained a strong professional commitment to and concern about the participation of women in mathematics and related fields, in academic roles, in industry, and in science and education policy.

Today, with the exciting new horizons described in the National Research Council report *The Mathematical Sciences in 2025*, the possibilities for women to make extraordinary contributions to society through the mathematical sciences, and to participate in fulfilling and challenging mathematics-related careers, are more expansive than ever. I am concerned about two main problems: the ongoing challenge of attracting young women to mathematics and, in particular, how stronger precollege learning opportunities and instruction could help; and retaining women in mathematics—in undergraduate majors, in graduate school, and within academic careers in tenure-track and tenured positions. To address these ongoing challenges will require systemic approaches, led by committed and passionate people. If I have the opportunity to serve in the AWM leadership I would be excited to encourage a look toward the future and to help to build on the outstanding legacy of the AWM.

***Biographical Information:*** Joan Ferrini-Mundy began her career as a high school mathematics teacher and received her BS in mathematics education and an MS in mathematics from the University of New Hampshire, where she completed her PhD in mathematics education in 1980. She taught mathematics and co-founded the Summer-Math for Teachers program at Mount Holyoke College and served on the mathematics faculty at the University of New Hampshire from 1983 through 1999. From 1999 through 2010 she was at Michigan State University, serving as Associate Dean for Science and Mathematics Education in the College of Natural Science. Joan was a faculty member in the MSU departments of mathematics and teacher education and was named a University Distinguished Professor of Mathematics Education.

Ferrini-Mundy has had a number of public policy-related positions, including as Director of the Mathematical Sciences Education Board at the National Research Council (1995–1999) and in various positions at the National Science Foundation (program officer in Teacher Preparation and Enhancement, 1989–1991; and inaugural director, Division of Research on Learning in Formal and Informal Settings, 2007–2010). Currently Joan is the NSF Assistant Director for Education and Human Resources, a position she has held since 2011, serving as a member of the U.S. Government Senior Executive Service.

Ferrini-Mundy was an ex-officio member of the President's National Mathematics Advisory Panel and co-chaired its Instructional Practices Task Group (2007–2008). She was co-chair of the Federal Coordination in STEM Education Task Force which produced the 2013 *Federal Science, Technology, Engineering, and Mathematics (STEM) Education 5-Year Strategic Plan*. She has been a member of the Board of Directors of the National Council of Teachers of Mathematics, the Board of Governors of the Mathematical Association of America, and the American Mathematical Society's Committee for Research in Undergraduate Mathematics Education. She was president of the organiza-

tion Women and Mathematics Education. Joan's research interests include calculus teaching and learning, mathematics teacher learning, and STEM education policy.

**Rebecca Goldin, George Mason University**

***Statement:*** The AWM has supported my career and my mathematical interests in many ways, including travel grants, invitations to give talks, and, significantly, the Michler Prize in 2007. It would be an honor to serve as a Member-At-Large for the Executive Committee of the AWM.

I have been interested in issues related to girls and women in mathematics and in mathematical sciences since I was in high school, when I worked with an organization that had a program for girls in inner-city high schools promoting science in the summer. Since then, I continue to be engaged and interested in how best to keep girls and women interested in math (and science, for which math is a gateway), as well as how to promote an environment and culture in which women succeed in realizing their ambitions (or simply in pursuing their interests). I was deeply involved in the public academic response to statements by Larry Summers and many pundits as well about women's "innate" ability in mathematics, writing for the *Washington Post* and appearing on CNN.

Mathematics is becoming more important to success in fields outside of mathematics. At the same time, public funding of mathematics research and education are suffering. We need to include a broad audience in mathematics; this includes efforts to promote those in the profession as well as efforts to communicate mathematics to the general public. I love working directly with (very) young mathematicians; I volunteer for several math clubs (5th–12th grades) in the Fairfax area, and I have also spoken at a couple of Sonia Kovalevsky Day events and at the USA Science and Engineering Festival. I believe that young people who identify themselves as "mathematical" are far more likely to continue through school mathematics to get to the really good stuff. I

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CALL FOR NOMINATIONS

## The 2015 AWM – Joan & Joseph Birman Research Prize in Topology and Geometry

The Executive Committee of the Association for Women in Mathematics has established the AWM – Joan & Joseph Birman Research Prize in Topology and Geometry. This prize will be awarded every other year, beginning in 2015. The purpose of the award is to highlight exceptional research in topology/geometry by a woman early in her career. The field will be broadly interpreted to include topology, geometry, geometric group theory and related areas. 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 – Joan & Joseph Birman Research Prize in Topology and Geometry 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 Joan Birman who works in low dimensional topology and her husband Joseph Birman who is a theoretical physicist.

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, 2014**. If you have any questions, phone 703-934-0613 or email awm@awm-math.org.

have also enjoyed working with young journalists and thinkers, helping them to realize the power of mathematics.

I currently serve on the AWM Policy and Advocacy Committee in which we have attempted to address issues related to harassment in conference settings. I organized a special session of the AWM's 40th anniversary conference, which highlighted the incredible distance that women as a whole have come since AWM was founded. The AWM continues to play an important role for female mathematicians to gain exposure, experience, and recognition for their work. I look forward to promoting the involvement and mathematical achievement of women and girls as a member of the Executive Committee.

***Biographical Information:*** Rebecca Goldin holds a PhD from Massachusetts Institute of Technology in mathematics and a BA cum laude from Harvard University. Dr. Goldin did postdoctoral work at the University of Maryland with a National Science Foundation postdoctoral fellowship before she joined George Mason University, where she is currently a professor in the Department of Mathematical Sciences. She has received several disciplinary grants from the National Science Foundation to support her research in mathematics (symplectic geometry, group actions on manifolds, and recently random graphs), as well as the Ruth I. Michler Memorial Prize from the AWM. Goldin is a 2012–13 and 2013–14 Nifty Fifty speaker at the USA Science and Engineering Festival; she also coaches a Math Club, and provides logistical support for several others, in Fairfax, Virginia.

Goldin joined Statistical Assessment Service (STATS) as the Director of Research in 2004. Her work for STATS has been published in the *Washington Post*, and she has appeared on NBC, CBS, CNN and NPR. She has run workshops for journalists and students alike and has given talks about her work in statistical literacy across the country and internationally.

CALL FOR NOMINATIONS

## 2015 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, 2014** 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.

### Genetha Gray, Sandia National Laboratories

***Statement:*** I was very flattered to be nominated for an AWM Member-At-Large position. I feel that the AWM plays an important role in encouraging the careers of women. As a graduate student, I felt lucky to attend a diverse program with a "critical mass" of women students. We were able to discuss issues such as sexism (perceived or real) and work-life balance, and we were able to turn to one another for advice. I recognize that this was not a usual situation and in fact often find myself in work situations where I am the sole female representative. I am thankful that the AWM exists as a resource for those who need and want encouragement and advice from their peers, be they men or women. Moreover, I think that their programs aimed at showing women and girls all the joys that a mathematical career has to offer are important. It is mathematics that will allow us to find creative solutions to many of the world's problems such as identifying and deploying alternative energy sources, updating infrastructures such as roads and bridges, and finding cures for diseases. Therefore, it is to everyone's benefit to encourage a diverse group of individuals to study math and pursue careers that rely on math. Finally, on a personal note, I'd like to share that I welcomed a son about two years ago. It has changed my life in more ways than I can imagine and as part of the AWM, I hope to encourage women who are playing the dual (and sometimes contradictory!) role of mother and mathematician.

***Biographical Information:*** Genetha is a Principal Member of Technical Staff at Sandia National Laboratories in Livermore, CA where her work focuses on the calibration, validation, and analysis of numerical models with applications to engineering systems, energy-related systems, and groundwater management. Her research focuses on the hybridization of optimization and statistical techniques in order to create new methods that give uncertainty estimates for optimal solutions. This work has been supported both by internal grants and awards from external institutes such as the American Institute of Mathematics (AIM) and the Statistical and Mathematical Sciences Institute (SAMSI), and it received an outstanding paper award at the International Conference of Computational Science in 2010. She has co-authored more than 20 papers and has given over 50 presentations. Dr. Gray received a PhD in Computational & Applied Math from Rice University in 2002. She is an active member of INFORMS (Institute for Operations Research and the Mathematical Sciences) and serves as a member of the organizing committee of the Annual Analytics Conference. She also serves on the editorial boards of the *Pacific Journal of Optimization* and the *International Journal of Mathematical Modelling and Numerical Optimisation*.

### Bryna Kra, Northwestern University

***Statement:*** I have always been lucky to have support in my pursuit of mathematics: from family, from teachers and from friends. These strong support resources helped me enormously. Since I was a graduate student, I have worked to continue this chain of support, particularly for women mathematicians at all levels. I established active Women in Mathematics groups at two universities, mentored students at the undergraduate and graduate levels, and have led elementary students in hands-on activities to encourage greater math skills.

My personal trajectory led to a career in math research and university teaching. I remain committed to increasing the number of women in mathematics, especially the number of tenured women in research departments. I believe that the AWM is an essential advocate for women at all levels; it is a top priority to develop policies that increase mentoring and support for women mathematicians at all stages of their careers. I look forward to extending this work as a Member-at-Large of the Executive Committee.

***Biographical Information:*** Bryna Kra is the Sarah Rebecca Roland Professor of Mathematics at Northwestern

*continued on page 12*

University. She was an undergraduate at Harvard University and a graduate student at Stanford University under the direction of Yitzhak Katznelson. Before joining the faculty at Northwestern in 2004, she held positions at the Hebrew University of Jerusalem in Israel, Institut des Hautes Études Scientifiques in France, Ohio State University, University of Michigan and Pennsylvania State University. Kra was awarded a Centennial Fellowship of the American Mathematical Society in 2006 and the Conant Prize in 2010 and became an inaugural fellow of the society in 2012. She works in ergodic theory and dynamical systems, with a particular interest in problems at the interface of dynamics and additive combinatorics.

Kra was department chair from 2009–2012. She has served on the Council of the American Mathematical Society from 2008–2014 and as a member of its Executive Committee from 2010–2014, and has previously served on the Nominating Committee for the AWM. She currently serves on the Board of Trustees for the Institute of Pure and Applied Mathematics (IPAM) and on the National Academies' Board on Mathematical Sciences and Their Applications (BMSA). She is an editor for the *Bulletin of the American Mathematical Society* and an executive editor for *Ergodic Theory and Dynamical Systems.*

### Rosa Orellana, Dartmouth College

***Statement:*** The year I received my PhD (1999), 34% of doctoral degrees in mathematics were conferred on female students. Since then this percentage has hovered around 30%, often dipping below this mark. In the top 100 U.S. universities, less than 15% percent of tenure-track academic positions (and less than 10% of full professors) in mathematics are held by women. I believe the AWM plays a vital role in advancing opportunities for women in mathematics. Yes, we have come a long way. However, we still haven't gone as far as we need to go. Thus, I would be honored to serve as a Member-at-Large on the Executive Committee for the AWM and help bring us closer to equality.

I am committed to supporting women at all stages of their career. I believe that more can be done to mentor women after they receive their PhD and move on to tenure-track positions. Women often start academic positions without the luxury of a postdoctoral position which is essential to establish a research program. In addition, the workplace is still not family friendly. If elected I will promote ongoing programs of the AWM as well as advocate for new initiatives that will advance the retention of women as they move up their academic career.

***Biographical information:*** Rosa Orellana is an Associate Professor of Mathematics at Dartmouth College. She earned her PhD in 1999 from the University of California at San Diego under the direction of Hans Wenzl. After graduation she received the University of California President's Postdoctoral Fellowship at UC San Diego. While at Dartmouth she was awarded the Wilson Foundation Career Enhancement Fellowship and the John M. Manley Huntington Memorial Award at Dartmouth for newly tenured faculty for outstanding research, teaching and mentoring. She has also received grants from the NSF and the SIMONS Foundation.

Rosa's research is in algebraic combinatorics and representation theory. Recently her work has focused on the Kronecker product of two irreducible representations of the symmetric group. Rosa mentors postdocs and graduate students, and she is particularly passionate about mentoring undergraduate students and introducing them to research. At Dartmouth she has mentored over thirty students in research projects through programs such as the Women in Science Project. This past summer Rosa was the research leader for MSRI-UP which seeks to increase the number of minorities in the mathematical sciences; there she supervised eighteen students divided into six research groups. She has also organized Sonia Kovalevsky Math Days to encourage young girls to study mathematics. She co-founded a chapter of the Association for Women in Mathematics in an effort to increase the number of women taking and majoring in mathematics at Dartmouth. She is the PI for an NSA grant that funds Discrete Math Days in the Northeast.

**Talitha Washington, Howard University**

***Statement and Biographical Information:*** I am excited about my nomination for the AWM Executive Committee as a Member-at-Large. Through AWM, I have been able to experience an expansive, supportive community which promotes positivity, excellence and inclusion. Throughout my mathematical career, the AWM community has given so much to me that I look forward to giving back.

As I gave birth to my first child midway through graduate school, I became more acutely aware of the challenges and obstacles which plague female mathematicians. Since then, I have had the privilege to better the lives of fellow female mathematicians in a variety of ways. In 2010, I served on the Visioning Committee for the Infinite Possibilities Conference (IPC), a meeting created to address race/ethnicity or gender in the contexts of mathematics and statistics by promoting, educating, and encouraging women who are African-American, Hispanic/Latina, and American Indian. I have also been Editor for the National Association of Mathematicians (NAM), served on the Diversity Advisory Committee for Society for Industrial and Applied Mathematics (SIAM), and recently joined the Editorial Board of Mathematical Association of America's (MAA) *Math Horizons Magazine*. Serving both AWM and the AWM community will provide me an opportunity to help sustain this radiant beam in the mathematical community by combining various efforts across the aforementioned organization.

# 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**.

# Georgia Benkart Named 2014 Noether Lecturer

The Association for Women in Mathematics is pleased to announce that Georgia Benkart will deliver the Noether Lecture at the 2014 Joint Mathematics Meetings. Dr. Benkart is an emerita at the University of Wisconsin, Madison, where she was E. B. Van Vleck Professor of Mathematics. She has been selected as the 2014 Noether Lecturer for her prominence as an international leader in the structure and representation theory of Lie algebras and related algebraic structures.

Benkart received her PhD from Yale University with Nathan Jacobson. She has published over 100 journal articles, mainly within four broad categories: (1) Modular Lie algebras, (2) Combinatorics of Lie algebra representations, (3) Graded algebras and superalgebras, and (4) Quantum groups and related structures.

Many of her most important papers represent breakthroughs. Her work on the classification of the rank one modular Lie algebras and on the Recognition Theorem provided the building blocks for the subsequent classification of the finite-dimensional simple modular Lie algebras. The combinatorial tools developed in other papers provided an effective way to study the stability of root and weight multiplicities of finite dimensional as well as infinite dimensional Kac-Moody Lie algebras. Motivated by the creation and annihilation operators in physics, Benkart and Roby introduced a new family of algebras, "down-up algebras," that still inspire current research. Benkart and her co-authors introduced crystal bases for representations of general linear quantum superalgebras, and in a series of papers, she, jointly with others, determined the Lie algebras graded by finite root systems.

Throughout her career Benkart has given hundreds of invited lectures both nationally and internationally, including two invited addresses at the Joint Mathematics Meetings and a plenary lecture at a meeting of the Canadian Mathematical Society. She has held visiting positions at the Mathematical Science Research Institute and the Institute for Advanced Studies. Recognized by her peers for her contribution to the profession, Benkart was included in the inaugural class of AMS Fellows.

*Georgia Benkart*

Benkart has given excellent service to the mathematical community, particularly as a former president of AWM and as current AMS Associate Secretary. She has been a superb mentor for her 21 PhD students and many postdocs. She won the University of Wisconsin Distinguished Teaching Award in 1987 and the Mid-Career Faculty Research Award in 1996. A fantastic speaker, Georgia was the Mathematical Association of America Polya Lecturer for 2000–2002.

*The 2014 Joint Mathematics Meetings will be held January 15–18 in Baltimore, MD. 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 Fan Chung Graham, Carolyn Gordon, Susan Montgomery, Barbara Keyfitz and Raman Parimala.*

## EDUCATION COLUMN

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

*Ed. Note:* We are pleased to announce that Jackie Dewar, member of the Newsletter Team since its inception, has agreed to serve as Education Column Editor, now that she is Professor Emerita at Loyola Marymount. This will be a major help to me as editor. She invites contributions not only from our regular columnists (we thank them heartily for their years of service!) but also from others. In this issue, we include Jackie's regularly appearing article as well as a second article from Cathy Kessel, who has contributed often in the past to the newsletter and is the current AWM Education Committee Chair.

# Revisiting Gender Equity Concerns in K–16 Education

*Jackie Dewar, Professor Emerita of Mathematics, Loyola Marymount University, Los Angeles, CA*

My Education Column a year ago, "A Gender Equity Study of K–12 Classrooms Raises Questions for Collegiate Mathematics," closed by posing questions for collegiate mathematics instructors and departments to consider concerning gender equity, classroom climate, role models, and gender and diversity concerns related to teacher preparation programs (see Dewar, 2012). In this column I return to the topic of gender equity across K–16 prompted by four recent developments: *The Common Core State Standards (CCSS)*, the *Mathematical Education of Teachers (MET) II* report, the work underway by the MAA's Committee on the Undergraduate Program in Mathematics (CUPM) to revise the *2004 CUPM Curriculum Guide*, and a more recently initiated effort of the MAA's Committee on Teaching Undergraduate Mathematics (CTUM) to develop an accompanying pedagogy guide.

### The *Common Core State Standards*

The *Common Core State Standards* (CCSS) are a set of educational standards (see http://www.corestandards.org/) for K–12 in English language arts and in mathematics (http://www.corestandards.org/Math) that states can voluntarily adopt. To date, 45 states have done so for mathematics. The standards are designed to ensure that students graduating from high school are prepared to enroll in credit-bearing entry courses in two- or four-year college programs or to enter the workforce. The CCSS aim to provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. Two consortia are now developing assessments that will be aligned to the standards and replace existing end of year state assessments: PARCC (http://www.parcconline.org/) and Smarter Balanced (http://www.smarterbalanced.org/). Cathy Kessel writes about CCSS-related events in the other contribution to this issue's Education Column.

As for CCSS and equity: A very positive aspect of the CCSS is that these higher quality standards will benefit students of color, whose lower performance has been tolerated historically, or even worse, expected. But concerns about CCSS also arise relative to students of color, especially with regard to the cultural relevance of what will be taught and how English Language Learners (ELLs) will be affected. In other words, will ELLs be able to achieve the standards, and how will instruction have to change to make it "fair" or "possible" for them to do so. The *Understanding Language* website (see http://ell.stanford.edu, where additional material is being posted at least through the end of 2013) is an excellent resource for teachers of ELLs and others concerned with ELL education.

Relative to gender equity, a few things bother me concerning the CCSS assessments being developed by PARCC and Smarter Balanced: (1) The assessments to be given in grades 3 through 8 and 11 will be timed, just as the current State assessments are, and research (http://www.theatlantic.com/sexes/archive/2013/03/competitive-timed-tests-might-be-contributing-to-the-gender-gap-in-math/274406/) suggests that girls are disadvantaged by timed tests. (2) The tests will be administered online, and some of the questions will involve "drag-and-drop" type interactions with the computer. This may prove advantageous for students of higher SES (socioeconomic status) and boys, as both groups are likely to have more experience with and access to computers and computer games. (3) I also wonder whether and when the students taking the assessments will be asked to identify their gender. Research has shown that asking for gender *prior to* taking (as opposed to *after*) the AP-Calculus exam produces a stereotype threat effect that significantly affects scores, with negative consequences for girls (Danaher & Crandall, 2008).

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### *Mathematical Education of Teachers II*

MET II is a 2012 report by the Conference Board of Mathematical Sciences that updates a 2001 report titled *Mathematical Education of Teachers* (available at http://cbmsweb.org/MET_Document/). Some now refer to the older report as MET I. Both were written as resources for those who teach mathematics to future and inservice PreK–12 mathematics teachers. The report makes recommendations for the mathematics that teachers should know and how they should come to know that mathematics. It also asks more mathematicians and mathematics departments to assign high priority to the mathematical education and professional development of teachers (p. 7). A free print copy was mailed to mathematics departments across the nation and the report can be downloaded from http://cbmsweb.org/MET2/.

But what does MET II say about equity? The single use of the word "equity" in the MET II report relates to a footnote reference (p. 26) to the 2009 National Research Council report on *Mathematics Learning in Early Childhood: Paths Toward Excellence and Equity*. The stated reason for referencing that report is that, in the past, not enough attention has been drawn to teaching or learning of mathematics in early childhood. Regarding teachers of ELLs or other special needs students, the report advises that those with direct responsibility for teaching mathematics to these populations "should have the same level of mathematical knowledge as general education teachers in the subject" (p. 37). Likewise the word "gender" appears once in a footnote (p. 11) related to measuring student achievement by standardized tests. The discussion of staffing difficulties (p. 14) and teacher attrition (p. 15) is where we find mention of teaching lower SES or minority students. MET II does address beliefs and teaching practices (pp. 8–11), but makes no reference to characteristics of equitable classrooms and teaching practice (NCTM, 2000, 2001; Streitmatter, 1994).

### The CUPM Curriculum Guide

The Mathematical Association of America's Committee on the Undergraduate Program in Mathematics (CUPM) is charged with making recommendations to mathematics departments about the undergraduate mathematics curricula. It began issuing reports in 1953, updating them at roughly ten-year intervals. The last report came out in 2004, and work is underway for the next report. The 2004 Guide was the first to broaden its focus beyond the major to address specific student audiences such as students in general education or introductory courses and majors in partner disciplines. It also addressed the special needs of majors who intend to teach, seek nonacademic employment, or study graduate level mathematics.

The 2004 Guide states that its recommendations for teacher preparation programs were "informed by *The Mathematical Education of Teachers*" (p. 52). I think we can be fairly confident that the updated version will rely on MET II. Unfortunately, as just noted, MET II says little about "equitable teaching practices." To be fair, these are curriculum guides rather than pedagogy guides. Still, how courses are taught, not just what content is "covered," are critical factors in what students learn *and retain*. The current CUPM revision presents an opportunity to at least acknowledge the roles of pedagogy, classroom climate, and affective domain variables (see, for example, http://serc.carleton.edu/NAGTWorkshops/affective/framework.html) in promoting or suppressing learning, an opportunity I hope will be "taken" not "lost."

### Committee on Teaching Undergraduate Mathematics

Fortunately, another MAA Committee, the Committee on Teaching Undergraduate Mathematics (CTUM), has been tasked with pedagogical issues. Although CTUM was formed in 1977, it may be less well known than CUPM. The most current charge of CTUM, dating to 8/31/11, is: "to stimulate effective teaching, learning, and assessment in undergraduate education in the mathematical sciences. The work of the committee is focused on pedagogy, including instructional techniques and methods, assessment of student work, and classroom resources." (See more at http://www.maa.org/about-maa/governance/council-and-committees-list?cid=00302872.) This committee is currently at work on a "pedagogy guide" intended to be a companion to the CUPM guide, but its publication is likely to lag a year or two behind. The list of topics to be included is not yet finalized, and CTUM seems to be open to input from the mathematical community. It will be holding a focus group with the MAA Board of Governors (BoG) at MathFest 2014, while CUPM will host a similar one when the BoG meets at the 2014 Joint Math Meetings. I will be attending both of those meetings in my capacity as the Governor-at-Large for Teacher Education (2012–2015), so I invite you to email me at jdewar@lmu.edu with any input you would like me to present during these focus groups.

To sum up, these four initiatives (CCSS, MET II, CUPM Curriculum Guide, and CTUM Pedagogy Guide) raise questions about how the K–16 mathematics community

is attending to equity and diversity. Fortunately, these same initiatives can and should prompt us to initiate conversations with our colleagues, departments and schools of education about these topics. Meanwhile, both CUPM and CTUM offer opportunities for our input during 2014.

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## Common Core–Related Events

*Cathy Kessel*

The Common Core State Standards for Mathematics and for English Language Arts were released on June 2, 2010, and adopted by 45 states,[1] the District of Columbia, four territories, and the Department of Defense Education Activity. Some states have already implemented these standards in testing, notably: "Test Scores Sink as New York Adopts Tougher Benchmarks" (*New York Times* August 7). Others, including my home state of California, have different schedules. As I write, California plans official testing aligned to the new standards in 2014–15. This year, the plan is to use a preliminary version of the new test and not to report test scores, despite possible penalties from the U.S. Department of Education.

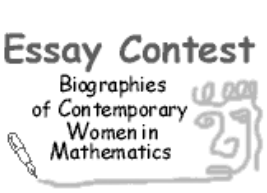
These events give a sense of the differences in testing for just two states—and a whole article could be written about those. Instead, this article is intended to give a sense of three other types of events connected with the Common Core State Standards for Mathematics (which I'll abbreviate as CCSS rather than CCSSM): survey responses from teachers, parents, and others; analyses of the CCSS by mathematicians; and political action against the Common Core. I've tried to keep references brief. Surveys are listed at the end of this article, and URLs that might be difficult to find are in footnotes. Disclosure: I edit the Progressions for the CCSS—narrative documents describing how topics develop across grade levels in the standards.

### On the Ground

Mathematicians have noted the need for mathematicians' "boots on the ground" with respect to teacher professional development and the Common Core. See, for

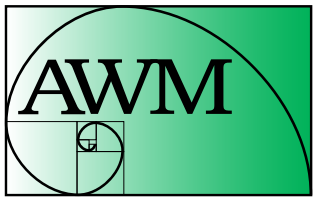
*continued on page 18*

[1] Minnesota adopted only the English Language Arts standards.




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 2014 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, 2014**. (To volunteer as an interview subject, contact Heather Lewis at the email address given.)




| | 76%–100% | 75%–51% | 50%–26% | 25% or less | Don't know |
|---|---|---|---|---|---|
| Teachers | 10 | 12 | 5 | 1 | 11 |
| Principals | 11 | 10 | 3 | 4 | 12 |

Numbers in cells refer to number of states. Source: Table 1, *Year 3 of Implementing the Common Core State Standards: Professional Development for Teachers and Principals, CEP.*

example, the recommendations from the Conference Board of the Mathematical Sciences 2010 Forum "Common Standards and the Mathematical Education of Teachers" or the MET II report. Determining the quality of professional development and the extent to which mathematicians have been involved is difficult. An easier related question is how much professional development has occurred. Survey results give some sense of the answer.

In 2011, the Center on Education Policy began surveys of state education officials that ask about CCSS-related activities. This year's survey asks about many things: plans for informing parents, preparation for assessment, teacher certification, collaboration with other states, staff expertise, staffing levels, etc. For example, officials in Common Core–adopting states estimated percentages of mathematics teachers and school principals who had participated in related professional development. The table above displays the distribution of responses from (respectively) 39 and 40 states. For example, 10 officials estimated that over 75% of teachers of mathematics in their states had participated in CCSS-related professional development.

National samples of teachers have been surveyed. *Education Week* and the American Federation of Teachers surveyed K–12 teachers. Two groups of education researchers (Cogan et al.; Davis et al.) surveyed teachers of mathematics. These surveys asked teachers about familiarity with the CCSS (e.g., whether they had read standards for their grade level), perceived quality or approval of common standards, and aspects of professional development or preparedness. I've summarized some responses in a second table below. The *Education Week* and Davis surveys asked similar questions about quality: were the CCSS higher quality (or

| | Sample | Familiar | Approval | PD |
|---|---|---|---|---|
| Cogan et al. | 12,000 mathematics teachers in 41 states, 60% elementary teachers, June–December 2011 | 82% | Like: 94% | Well-prepared?: 26% (G1, IA/WV) 100% (G8, WI) |
| *Ed Week*, EPE | 599 K–12 teachers (90%) or other instructional specialists who are users of edweek.org, October 2012 | 78% | Higher: 49%<br>Same: 44% | PD > 5 days: 28%<br>PD < 1 day: 12% |
| AFT–Hart | 800 K–12 teachers who are AFT members, March 2013 | 79% | Approve: 75%# | None: 22%<br>Adequate: 43% |
| Davis et al. | 403 public school middle school math teachers (randomized based on state) Spring 2013 | 86%* | More rigor: 86%* | Over 80% received < 20 hrs |

# No information given about classification of responses from teachers in states which did not adopt the standards.

* Responses differed by 1.1 percentage point for separate questions about content and practice standards.

more rigorous) or similar to prior state standards? The AFT survey asked if teachers approved of the state's decision to adopt the Common Core. Cogan et al. asked if teachers liked the idea of common standards for mathematics. Their sample was by far the largest, and they reported responses for preparedness by state and grade level (for grades 1–9).

In short, most teachers approve of the Common Core standards, but many teachers have received little or no related professional development or feel what they received was inadequate.

### Online

I can't say anything about the quality of the in-person and online professional development that is occurring. I hope that others can in future columns. (However, it's worth noting that Al Cuoco at EDC has been involved in developing an online course for high school mathematics teachers that is offered nationally.[2]) Much of the professional development action that I see occurs on Bill McCallum's blog Tools for the Common Core, so I can't claim to have made a systematic survey. I call it "professional development action" because it does not occur as part of an event labeled "professional development." However, it is related to a goal of such events for teachers: increased knowledge of school mathematics, and of the CCSS. Some of the blog conversations have been very gratifying to see. In a few cases, the topics are frustrating because they focus on conventions rather than substance. For example, the post "To B or not to B" is about notation in volume formulas. The idea that different definitions of a notion were possible was a stumbling block for some (see the comments on fraction and ratio under the post on the Ratio and Proportional Relationships Progression). But, given that such things need discussion, it's wonderful that they're getting discussed from a mathematician's point of view.

### Standards vs. Testing

Other online discussions are less gratifying, such as those that equate the CCSS with high-stakes testing.[3] Although annoying, this is understandable. Testing is a well-established educational tradition in the United States. Oral tests were a part of colonial schooling and written standardized tests began in mid-nineteenth century Massachusetts. According to *Asking the Right Question*, an Office of Technology Assessment study:

> standardized testing came to serve an important symbolic function in American schools, a sort of technological embodiment of principles of fairness and universal access that have always distinguished American schools from their European and Asian counterparts. (p. 108)

Although cross-national differences in fairness and access have faded,[4] the symbolic function of testing apparently has not. A recent Associated Press–National Opinion Research Center survey found that most (61%) parents or guardians surveyed said their children took the appropriate amount of standardized tests, 26% thought there were too many, and 11% thought there were too few. These attitudes varied with income and education. Low-income and less educated respondents tended to view testing more positively. Although many parents had not heard of or knew little about the Common Core (see table, page 20), they supported it in the sense that they supported the idea of common standards.[5]

Frequent use of high-stakes standardized tests is well established and well accepted in U.S. education, but that is not necessarily the case in other countries. In particular, China, Hong Kong, Japan, Korea, and Taiwan—all countries which have performed well on international comparisons—have done so without such tests before grade 8. Singapore has one high-stakes test at the end of grade 6.[6]

*continued on page 20*

[2] For information, see http://mpi.edc.org/dmp-hs-sampler.

[3] An interesting feature of the new assessments being developed is that some parts are diagnostic (aka "formative"), thus not high-stakes, www.parcconline.org/non-summative-assessments; http://www.smarterbalanced.org/wordpress/wp-content/uploads/2012/02/Smarter-Balanced-Teachers.pdf.

[4] The U.S. has not been pre-eminent in educational enrollment and graduation for some time. NSF reports that in 2008 the United States ranked 11th out of 25 in college enrollment rates among OECD countries. For high school graduation: "Of the 25 OECD nations for which graduation rate data were available in 2008, the United States ranked 18th, with an average graduation rate of 77% compared with the OECD average of 80%," http://www.nsf.gov/statistics/seind12/c1/c1s4.htm. In 2012, that rank became 22nd out of 27 OECD countries (*Wall Street Journal*, 2013, January 22).

[5] E.g., Harvard PEPG: "As you may know, all states are currently deciding [in 2013!] whether or not to adopt the Common Core standards in reading and math. If adopted, these standards would be used to hold the state's schools accountable for their performance. Do you support or oppose the adoption of the Common Core standards in your state?"

[6] For details and references, see my blog post on national context at http://mathedck.wordpress.com/.

| Survey | Sample | Heard of CCSS | Support |
|---|---|---|---|
| Cogan et al. | Parents of students in grades 1–8, early 2011 | —20% | |
| | Parents of students in grades 1–8, fall 2011 | —50% | 68%* |
| Harvard PEPG | Representative oversamples of: public school teachers, parents or guardians of school-age children, African Americans, and Hispanics, 2013 | — | 65% |
| PDK–Gallup | National, May 2013 | 38% | — |
| | Parents of public school children | 45% | |
| AP–NORC | Parents or guardians of school children, 2012–13 | 48% | |

* Mathematics only.

Frequent testing is an important influence on the form that standards take in the United States. Bill McCallum (the lead writer for the CCSS) put it this way:

> State standards have direct policy and legal consequences, and are used as a basis for writing assessments. They are flat lists of performance objectives of even grain size, designed to be delivered into the hands of assessment writers without the need for much discussion or interpretation.
>
> It was against this background that the Common Core State Standards were written. On the one hand they were commissioned by the states and had to be the type of document states were used to: detailed bulleted lists describing what we want students to know and be able to do. On the other hand, they were being asked to do something new, to break out of the system that produced the mile wide inch deep curriculum.[7]

Because standards have different functions in different countries, comparisons of standards documents do not necessarily result in comparisons of expected performance. In countries where the ministry of education produces textbooks or works closely with publishers, expectations are also conveyed by textbooks and teacher's manuals.

### Standards Comparisons

Such differences affect the accuracy of some comparisons of the CCSS with standards from other nations. After the CCSS were released in 2010, two such comparisons were produced by mathematicians. I've written separate blog posts on details of each.[8] One comparison, for example, worries about "special tricks" such as "make ten" for grade 1 arithmetic and concludes (mistakenly) that they are unique to the CCSS. These "special tricks" do not appear in some of the terser standards documents and textbooks from high-achieving countries. Instead, they are evident in teacher's manuals and findings from cross-national research.

A more sweeping difference is that standards documents in other countries are often not standards for performance (as in the U.S.) but standards for curriculum. They give standards for what students should be taught, but not detailed expectations for what students should be able to do. For example, one comparison seems to interpret phrases such as "include" (Singapore) or "teachers can encourage" (Taiwan) as "students should be able."

[7] http://commoncoretools.me/2012/07/13/my-talk-on-the-common-core-at-icme-12-in-seoul-korea/

[8] http://wp.me/pJHdC-83; http://wp.me/pJHdC-88.

### Political Phenomena

These comparisons would probably fade quietly into obscurity except that selected aspects have been publicized by political efforts concerned about centralized government (or, more flamboyantly, "socialism"). For example, according to the Pioneer Institute's web site: "Since 2009, Pioneer has led the campaign against Common Core national education standards and federal control of K–12 education policy." Another effort, Fight Common Core, was "created by American Principles Project to provide information about the dangers of centralizing education through the Common Core State Standards and the work that is being done at the state and federal levels to repeal it." The network Truth in American Education includes "parent-founded education watchdogs, grassroots organizations interested in fiscal and curriculum issues, family organizations, free-market think-tanks, private school groups, and nationwide advocacy groups."

Given that these campaigns seem to be against any form of common standards—and more generally anything perceived as centralization of education—the quality of the CCSS does not seem to be their main concern. Instead, they seem to make opportunistic use of adverse criticisms, regardless of their quality. Emotional appeal rather than careful scholarship seems to be the favored tactic.

In this and other ways, these campaigns remind me of the "merchants of doubt" so carefully documented in the book of the same name. Their activities contributed to delays in policy on tobacco, acid rain, ozone, secondhand smoke, and climate change, with concern about government regulation as a motivating factor. It's not hard to imagine that ignorance of mathematics and statistics contributes to this agenda. But, paradoxically, promoting such ignorance may not be intended by those against the Common Core.

### Surveys: State Officials and Teachers

*Year 3 of Implementing the Common Core State Standards: An Overview of States' Progress and Challenges*, Center on Education Policy, George Washington University, http://www.cep-dc.org/index.cfm?DocumentTopicID=1

*Findings from a National Survey of Teacher Perspectives on the Common Core, Education Week*, Editorial Projects in Education Research Center, http://www.edweek.org/media/epe_survey_teacher_perspectives_common_core_2013.pdf

*Teachers Assess Implementation of the Common Core*, American Federation of Teachers, Hart Research Associates, http://www.aft.org/pdfs/press/ppt_ccss-pollresults2013.pdf

*Implementing the Common Core State Standards for Mathematics: What We Know about Teachers of Mathematics in 41 States,* Cogan et al., Education Policy Center, Michigan State University, http://education.msu.edu/epc/publications/

*Common Core State Standards for Mathematics: Middle School Teachers' Perceptions*, Davis et al., Warner Center, University of Rochester, http://www.warner.rochester.edu/files/warnercenter/docs/commoncoremathreport.pdf

### Surveys: Public and Parents

*The 2013 Education Next Survey*, Harvard Program on Education Policy and Governance, http://educationnext.org/the-2013-education-next-survey/ [Survey questions: http://educationnext.org/files/2013ednextpoll.pdf]

*The Public's Attitudes Toward the Public Schools*, PDK/Gallup, http://pdkintl.org/programs-resources/poll/

*Parents' Attitudes on the Quality of Education in the United States*, Associated Press-NORC Center for Public Affairs, http://www.apnorc.org/projects/Pages/parents-attitudes-on-the-quality-of-education-in-the-united-states.aspx

*Implementing the Common Core State Standards for Mathematics: What Parents Know and Support*, Cogan et al., Education Policy Center, Michigan State University, http://education.msu.edu/epc/publications/

## AWM Ballot

You will receive an e-mail inviting you to vote electronically (or see www.awm-math.org/ballot.htm); those who prefer may mail this ballot or a copy thereof to AWM, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030, to be received by **December 15, 2013**. You must validate your ballot by signing your name on the envelope, or your votes will not be counted.

President-Elect (vote for one):

❏ Kristin Lauter ❏ _____

Clerk (vote for one):

❏ Janet Beery ❏ _____

Member-at-Large (vote for up to four):

❏ Alissa S. Crans ❏ Rachelle DeCoste

❏ Joan Ferrini-Mundy ❏ Rebecca Goldin

❏ Genetha Gray ❏ Bryna Kra

❏ Rosa Orellana ❏ Talitha Washington

❏ _____ ❏ _____

❏ _____ ❏ _____

## 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.

## WIMM Watch: *Glee:* The Brittany Code

*Sarah J. Greenwald*

On the fourth season finale of *Glee* [1], Fox's popular singing drama, two MIT mathematics professors deemed ensemble character Brittany Pierce a mathematical genius, but I was not convinced.

Last season Brittany failed to graduate high school, but this year she has obtained a near-perfect SAT score. Perplexed at such a high score from someone who has only a 0.2 GPA, the professors administer a math test. Brittany scores a 0 on it. However, the faculty are very interested in the back of her test paper. Brittany has drawn numbers in various colors using crayons. In a work that looks like it was created by a small child, the numbers are facing every which way (and angle). The professors ask her about them:

> Brittany: *I didn't know any answers on the test… So I had all these numbers swirling around in my head so I just decided to write them all down so my brain would stop feeling so tickly.*

The faculty somehow seem to identify Avogadro's constant, Planck's constant and a large prime number on her test paper and choose to call it "The Brittany Code." They note that it is the "most important breakthrough of the 21st century" and feel that she might be the "most brilliant scientific mind since Albert Einstein." Later in the episode we find out that she has been offered early admission to MIT.

I found this all to be a very strange turn of events for the show. Brittany's character has always been portrayed as the stereotypical dumb blond, so I don't know what to think of the idea of her subconscious being able to create a prime number that only a supercomputer typically can.

This seems to be yet another example of a disturbing trend of numerology being disguised as mathematics on TV (see [2]). However, in this particular show, I couldn't even find the numbers they referred to, and was left with the impression that the show's writers were too lazy to even look up Planck's constant or Avogadro's number and put some of the digits on Brittany's test paper. At the very least, I might have been happier if they had managed to sing about "mathematics" in the episode, but alas that was not to be either.


[1] "All or Nothing." *Glee* Season 4 Episode 22. Original airdate May 9, 2013. http://www.fox.com/glee/recaps/season-4/episode-22/

[2] Greenwald, Sarah J. "*Touch:* The Amelia Sequence." Association for Women in Mathematics Newsletter, 43(3), May–June, 2013, p. 16.


## BOOK REVIEW

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

**Mathematics in Popular Culture: Essays on Appearances in Film, Fiction, Games, Television and Other Media**, edited by Jessica K. Sklar and Elizabeth S. Sklar. McFarland, 2012 ISBN-13: 978-0786449781.

**Loving+Hating Mathematics: Challenging the Myths of Mathematical Life**, by Reuben Hersh and Vera John-Steiner. Princeton University Press, 2011. ISBN-13: 978-0691142470.

**Mathematicians: An Outer View of The Inner World, by Mariana Cook**. Princeton University Press, 2009. ISBN-13: 978-0691139517.

*Review by Gizem Karaali, Pomona College,* gizem.karaali@pomona.edu

I was delighted to have the opportunity to review three books on a topic near and dear to my heart. In recent years it has become a passion of mine to think of and speak about the place of mathematics in the real world, in the world of those who are not doing mathematics for a living. I care about the applications and the implications of mathematics, but more than that, I care about the feelings and the impressions attached to it. Often math anxiety or skepticism comes up; the latter may be due to how frequently others (mis)use statistics, but the former is often directly related to the way we (mathematicians and math teachers) teach math (see for instance Jo Boaler's classic *What's Math Got to Do with It?*[1]). However, besides the troubles with our pedagogy, I think we as a community help

perpetuate several myths about mathematics and reap and enjoy the fruits of our specialness.

When mathematicians speak to outsiders, they like to emphasize how it is about objective and universal truths (or occasionally, Truth with a capital T) and how its purity is at the root of its power (see Figures 1 and 2 at right).

If it ever comes up, some will also point out that mathematics is a democracy or perhaps more accurately a meritocracy. In particular those who make it to the top of the echelon of academic mathematics are the geniuses and the bright prodigies. These are recently becoming more and more human as many among them strive to communicate with the rest of the world to share what math is all about and whatnot, but still when push comes to shove, they remain different from the rest of us by means of their sheer genius.

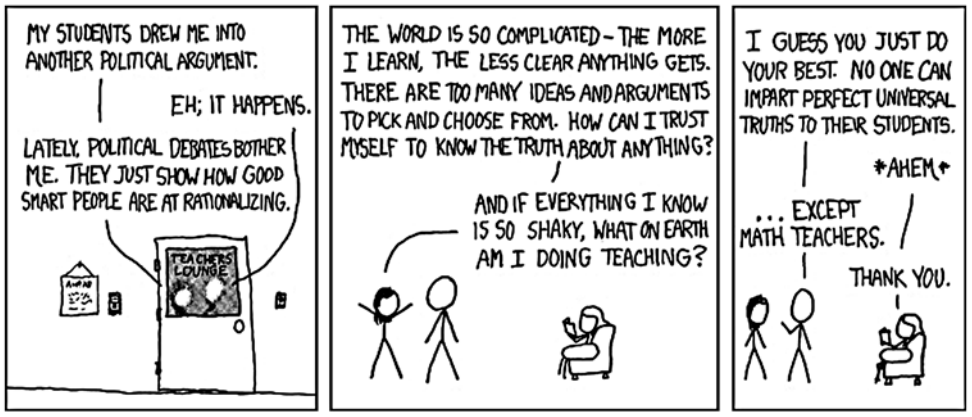



Figure 1: Certainty, from http://xkcd.com/263/, accessed September 23, 2013.

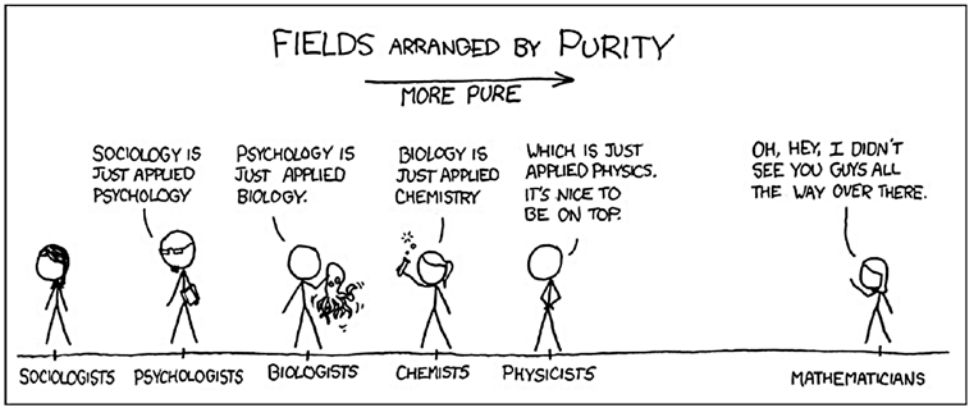



Figure 2: Purity, from http://xkcd.com/435, accessed September 23, 2013.

This is where the oldest book among the three under review comes in. *For Mathematicians: An Outer View of The Inner World*, the photographer Mariana Cook ventured into the universe of ninety-two mathematicians through interviews and photographs and was enamored of their inner world: Their vision of an amazingly deep and connected life of the mind which seeks elegant solutions to often simple-sounding but rather tricky problems, their gracious and generous perspective of mathematics. Each essay reads like a beautiful self-portrait, each photograph manages to capture something special about the unique personality involved.

Mariana Cook and the ninety-two mathematicians she has interviewed make a great case for mathematics, its beauty, its amazing power, and its status as a pinnacle of human achievement. Thirteen of these interviewees are women. As declared in the Introduction, "the hope of its creators is that this book might be a way of indicating that the pursuit of mathematics is a continuing activity that attracts a wide variety of delightful, individualistic, and devoted men and women, and might give at least some indication of what motivates and inspires these mathematicians." To this end, at least for this reader, the book does a very convincing job indeed.

Those portrayed are the heroes of mathematics, they are at the top of the game of math, all teaching at world-renowned institutions (with a quite visible bias for Princeton of course, given that the selection of people to be included was not really random, in the statistical sense of the term), and it is clear that they are all geniuses!

But let us go a bit deeper and read a bit more. The Preface says a lot in very little space:

> Mathematicians are exceptional. They are not like everyone else.... For starters, most of them are a great deal smarter.... Truth is the ultimate authority in mathematics.... Mathematicians are bound

*continued on page 24*

[1] *What's Math Got to Do with It?: How Parents and Teachers Can Help Children Learn to Love Their Least Favorite Subject*, Jo Boaler, reprint edition, Penguin Books 2009.

> by fairness.... There is a notable kinship among mathematicians. Students are appreciative of the time and effort given them by their professors, and in turn, they nurture the next generation.

Isn't this the image of mathematics and of mathematicians we love to portray to the outside world? And we often believe it ourselves. We believe that we are the chosen ones, that we have, in Cook's words, "the capacity to perceive the world abstractly at a remarkable level of sophistication" and of course, we are smart and fair. And yet we nurture and we appreciate.

This is the ideal of what mathematics is and for most determines who a mathematician should be. Some might remember that Reuben Hersh in an earlier collaborative work (with Philip Davis in *The Mathematical Experience*[2]) wrote about *the ideal mathematician* too, but his ideal mathematician was unmistakably a caricature of the absent-minded math professor disconnected from the rest of the world. Many of us believe that this is not what we strive toward. An ideal is by definition (taken directly from my laptop dictionary) a standard of perfection, a principle to be aimed at. In this sense then, I think it is fair to say that our ideals are portrayed faithfully (and most attractively) by this book.[3] But again the dictionary tells us that an ideal exists "only in the imagination"; it is "desirable or perfect but not likely to become a reality." So what to do with that sense of the word? How much of the Cook book offers us myths as opposed to realities?

Reuben Hersh and Vera John-Steiner in *Loving+Hating Mathematics: Challenging the Myths of Mathematical Life* take the myths of mathematics head on and turn some of them upside down. They start out in their preface specifically pointing out the four myths as they see them:

Myth 1: Mathematicians are different from other people, lacking emotional complexity.
Myth 2: Mathematics is a solitary pursuit.
Myth 3: Mathematics is a young man's game.
Myth 4: Mathematics is an effective filter for higher education.

They challenge these myths persistently. They challenge by telling stories; their narrative touches upon the lives of Joan Birman, Israel Moiseyevich Gelfand, Sophie Germain, Alexandre Grothendieck, Clarence Stephens, Bella Abramovna Subbotovskaya, Karen Uhlenbeck, and many other mathematicians. They pose intriguing questions about the nature of mathematics and what it means to be doing mathematics. Even though most mathematicians mentioned are white men, the authors do attend to the issues of gender disparities and are careful to note explicitly that the field benefits from being open to diversity. In fact, there is a lot to read here about this latter issue. Readers of this newsletter might like to learn that a whole section of chapter 6 covers AWM (pp. 218–223). One of the education chapters focuses on an explicit comparison of the Potsdam method, the method used in SUNY Potsdam (then Potsdam College) in the seventies and eighties to invite students of diverse backgrounds and abilities to the mathematics major and to develop a sense of community where all felt welcome and capable, with the Moore method, which encouraged stiff individualistic competition and intentionally or inadvertently discouraged those who were typically perceived not to belong to the world of mathematics. In fact nowhere else in the book are the two authors more explicit about their disapproval of a character they describe. R. L. Moore pretty much comes across as racist and elitist, a perspective that is not always the standard portrayal of this past president of the AMS and member of the National Academy of Sciences.

Like the first book mentioned above, this book is intended for an audience of non-mathematicians. Hersh and John-Steiner clearly think that the public image of mathematics could use some help. John-Steiner says in an interview: "Instead of the sense of panic that surrounds mathematical achievement in the USA, we need to make the field and its practitioners more accessible to the public, less forbidding, and that is part of the objective of our book."[4] In the same interview, Hersh does not spare his words; the following are probably also aimed at some of his own colleagues: "teaching a math class is not just an unwelcome interruption in the

[2] Reprint edition, Mariner Books 1999.

[3] As Robert Clifford Gunning writes accurately in the Introduction, "Cook is a superb photographer who could not only create perceptive records of the individuals she talked to but could also bring out some of the aspects of their personalities that might indicate the sort of people who find the mathematics an overwhelming delight and challenge and what motivates them in this really rather arduous and compelling activity."

[4] "Loving and Hating Mathematics," Serena Golden, *InsideHigherEd*, May 17, 2011, http://www.insidehighered.com/news/2011/05/17/discussion_with_authors_of_new_book_on_mathematical_life, accessed September 19, 2013.

life of a mathematician, but actually an encounter with other human beings."

*Mathematics in Popular Culture: Essays on Appearances in Film, Fiction, Games, Television and Other Media*, the book by the mother-daughter duo (Elizabeth Sklar and Jessica Sklar), is a collection of essays. As such the reader may feel comfortable skipping around and picking and choosing what she wants to read. I initially did just that, and found that I really enjoyed all the essays I read. So I started again at the beginning and read straight through. First of all, I was fascinated by the facts: I learned a lot about my favorite online comic *xkcd* ("*XKCD:* A Web of Popular Culture," Karen Burnham) and two of my favorite math movies *Mean Girls* ("*Mean Girls:* A Metamorphosis of the Female Math Nerd," Kristin Rowan) and *Stand and Deliver* ("*Stand and Deliver:* Twenty Years Later," Ksenija Simic-Muller, Maura Varley Gutierrez and Rodrigo Jorge Gutierrez); I also learned much about the most infamous mathematician of our time, Ted Kaczynski ("The Mathematical Misanthrope and American Popular Culture," Kenneth Faulkner). I was also fascinated by the disciplinary diversity of contributors: Only about half of the whole list of contributors is made up of people who would traditionally be called mathematicians, and one of the two editors, Elizabeth Sklar, is an English professor. Perhaps as a result, the book is a genuinely multidisciplinary look at mathematics in popular culture, not just written by mathematicians who have the inside perspective (which might not necessarily be "the right perspective") but also brings to the topic diverse and yet thoughtful reactions to math in popular culture.

While reviewing this book, I checked Amazon for reviews. There was only one, and I was startled by its unpleasantness. This helped me realize that the book may not necessarily appeal to a reader who is looking merely for a fun read, but more to an educated reader who enjoys scholarly thought and careful analysis.

To some alien who just landed on our world and for whatever reason wants to know about our mathematics,[5] I'd suggest, first read Sklar's edited volume together with the portraits in Cook. (Sklar's volume will bring you up to speed with our pop culture as a bonus even if you only want to understand math). Then think for yourself whether (and if so how) the perceptions and presentations of mathematics and mathematicians in popular culture that are analyzed in the Sklar essays can be propagated by the portraits: though certainly humanizing them (and aiming thus to dismantle part of Myth 1 and possibly some of Myth 3 in Hersh and John-Steiner's list), Cook's essay basically accentuates the genius factor in mathematics. (Who in their right mind would strive to become a mathematician if they know for a fact that they are themselves not geniuses?) And then come back to Earth, a planet that includes many more kinds of math people, by reading Hersh and John-Steiner. Get "a joyous and balanced view of the mathematical life of reason, emotion, and learning," a perspective of mathematics that might be just a tad more realistic, just a tad more inclusive, just a tad more welcoming to people of different backgrounds and tendencies.

[5] Perhaps the alien is itself a mathematician? Mariana Cook in her Preface provides a possible explanation: "The mathematicians in each galaxy will be able to see patterns in one another's language. They will decipher symbols and soon they will exchange ideas with a respect for their mutual effort to understand."

## MATHEMATICS, LIVE!

# A Conversation with Yingda Cheng and Fengyan Li

*Interviewer: Evelyn Lamb, postdoc, University of Utah. She blogs about math for* Scientific American *at Roots of Unity and for the American Mathematical Society at the Blog on Math.*

Yingda Cheng and Fengyan Li are both researchers in numerical partial differential equations. Cheng is an assistant professor at Michigan State University, and Li is an associate professor at Rensselaer Polytechnic Institute in Troy, New York. They organized a special session on numerical PDEs at the AWM research symposium in March 2013, and I talked with them there. This is an edited transcript of our conversation.

**EL:** Would you like to start talking about how you started doing math?

**YC:** When I was young, I was very interested in science in general. When I went to college, I was undecided between math and physics. Eventually I went with physics for quite a few years. Pretty much at the last year of my college, I decided I didn't really want to do physics, I wanted to do math. But I didn't want to do pure math, I wanted to do applied math.

At the time I think I was trying to embrace the idea of using computer software algorithms to solve real application

*continued on page 26*

problems from physics. Eventually I learned there is a whole area of applied math, in particular numerical PDEs, and I figured out that's what I wanted to do. Eventually I went to graduate school at Brown, and Fengyan also did. We studied numerical PDEs, and that's pretty much how I got into it.

**FL:** For me, when I was young, mathematics was always my strongest subject. I didn't have to think much. I went to college, and our system in China is that you go there and join a department right away. So I joined the math department and never got a chance to think about physics at the time.

At that time advanced mathematics students started just with the pure math classes. We didn't have a major where you could do applied, or pure. I enjoyed it a lot, but at the same time I realized that there are so many different branches of math, some of them so hard! I had a lot of enjoyment of learning new things at the time. I was so busy, trying to understand all the different areas. Later on I was exposed to computational components. With pure math, you somehow get the feeling that it's hard, you really need to concentrate. There's lot of beauty in it. But later on, when I was exposed to the computation I realized it was something I wanted to get into because it's also deep. There are a lot of things beyond what you can really analyze. There are people who imagine that computational math is just crunching numbers, you know. But it's not.

And I got the feeling that only things you can prove are good. But then you realize there are lots of other aspects. Because of finite digit representations on the computer, you find that there's another branch of art, which relates to computation. The more I learn about it, the more I think I enjoy it.

**EL:** Are both of you from China, or Taiwan?

**YC:** We are from China, but different parts.

**EL:** What kind of culture shock have you found when you moved to the US?

**FL:** In terms of study, my big change was in terms of how I appreciate mathematics, in particular computational mathematics. Before I came I thought that everything was good if you could prove it. Provable things are good things. I thought this until I came to Brown. I remember one professor was talking about a particular subject, and he first talked about something you can prove, but then he talked about some component of this method that makes it harder to use. There's another thing you cannot prove, but it's much easier to use. That's when I realized that what's useful is important. Subject-wise, I think that was a big change for me, in terms of how I appreciated what was good mathematics.

**YC:** I agree. I think that's after I got to Brown, the professor said, "the algorithm has to be useful." That's paramount.

**FL:** But there are a lot of other aspects of the culture. It's so different! In the grocery store, everything looked big. All the fruits and vegetables looked big when I first got here! That was very different. But you know, you get used to it.

**EL:** Are you planning on staying in the US for the long term?

**FL:** For me, I don't know yet. In particular I'm on sabbatical this semester, and I'll spend two months in China. I want to use this as an opportunity to visit a couple places. I have some collaborators there. I visit quite often, but most of the time it's for a shorter visit. I want to have another experience of how it feels to work in that environment.

**YC:** I guess I'm a bit junior, so I'm focused on research more. I haven't thought about whether I'll be staying in the US.

**EL:** So you met in grad school?

**FL:** We had one year overlap.

**YC:** Yes, one year.

**FL:** I was wrapping things up when Yingda joined there. At the time we had a little overlap, and then since we came from the same research group, afterwards we had a lot of interaction. We have collaborations as well. The talk Yingda presented today was based on our joint work.

**EL:** Do you have advice for people who are thinking about going into math in general or PDEs in particular?

**YC:** I have some advice for research. I think for me there is a transition between being a student and being a researcher. The earlier you become independent, the better. That's my impression. There's a big difference between taking classes and doing research. In research it's open-ended. Your homework problem has a solution, and research might not have a solution. I think there's a transition, which might be difficult at first.

**FL:** A student's interest is very important. There are so many different branches of mathematics. I saw people who had to eventually switch direction because they never found it natural. There will be a stage when, if you think you like mathematics, it's worth the effort to take the time to see what will fit you best.

**EL:** Do you have stories about how that happened in your life? Did you try a lot of different things?

**FL:** In China, especially in my program, everybody started the same. You don't distinguish between statistician, pure mathematician, and so on. At the beginning you spend three years all taking the same courses. That was the time I

realized there were a lot of things which are very elegant but very hard. In some of the courses, I figured out what the flow was. In other courses, I followed the logic, but I didn't get into it. So this experience plus later on in numerical methods, approximations, et cetera, I think we probably had a couple courses I really enjoyed. Eventually I found the subject I really wanted to go into.

Sometimes in applied math, you accumulate some skill and go into a company right away. I appreciated the beauty of mathematics, and I personally feel that numerical PDEs is somewhere between applied and pure. You do need to have a lot of analysis, and also you have to extract a lot of understanding based on a simulation. So that's the part I really like about it.

**EL:** Have you felt any particular challenges as women, or women from another country, working in math in the US?

**FL:** Either I wasn't sensitive, or my environment was supportive. I don't remember many unfriendly comments. Growing up, around me there were a couple girls who were smart in mathematics. When I came here, I think at Brown, there were a nice group of girls who really performed well in graduate school. So I personally didn't feel much until I heard people from other fields, like physics, who were really in the minority. I've heard some stories where it happened a different way!

**YC:** For me, like Fengyan, I didn't feel that. Brown has a very large body of women students. After graduate school I went to UT Austin as a postdoc, and my mentor was a woman, and my officemate was also a female postdoc. Now I have a tenure-track job at Michigan State, and my first student is female. My postdoc is also female. So I haven't felt that much! I like working with both males and females.

**FL:** The only thing I've felt in terms of women's issues is I remember the first time I went to a conference, I wasn't sure how I should dress, because at that time the applied math department at Brown didn't have women faculty. So I was confused. How should I dress myself? Jeans and a t-shirt, or very formal? Eventually I picked the safer side. I really dressed myself up. At that time I wished I could see a few more people to teach me something related, not about research, but relevant!

**EL:** Yes, the cultural norms.

**FL:** Exactly. You don't know. Especially when you're so junior. You don't know how you should present yourself.

**EL:** So do you have any fashion advice for a woman going to her first PDE conference?

**FL:** I feel it's always nice to dress nice. You're comfortable, and you don't want to think about it during a talk. Although in math, overall people are a lot more relaxed about what to wear. But for us it's sometimes more of an engineering oriented conference. It's quite common. But you don't want to think about it. You don't want to stand there and feel like you're not in the group. But it's also very pleasant to dress well.

**YC:** Just dress normal. There's no dress code. But if you go to an interview, make sure to dress nice!

**EL:** Getting back to mathematics, is there anything else you'd like to say that you haven't had a chance to get to?

**FL:** It's not directly about mathematics, but when you are working on something you really enjoy, along your career you'll experience a lot of other things that aren't related to the project. So my experience and my observation from yesterday's panel discussion [on the impostor syndrome], is if you're distracted by something, your interaction with colleagues or your confidence, I've found it's very important to have a support group. It could be a mentor, you could make some friends at conferences, it could be your academic siblings. Talk about it. Otherwise it's a waste of time.

**YC:** It consumes so much energy.

**FL:** Overall it's good to talk to somebody. I find that's important.

**YC:** I agree with Fengyan.

**EL:** How did you organize this symposium? Did you volunteer?

**FL:** I think we were lucky. I believe one of the senior professors nominated our names, so we were contacted by the organizers. "Are you willing to organize a session?" I was very excited because I think this is a very rare opportunity to just gather a group of women researchers together. I usually enjoy the activities organized by AWM. I've benefited a lot in the past.

**EL:** How did your sessions go?

**FL:** It was great. I heard a lot of positive feedback. The talk quality was really high.

**YC:** It was a close setting, so people were free to ask questions. There were more discussions.

**FL:** There was a lot of overlap between research interests. I hope to see more events like this! It seems like they are thinking of doing it more.

**YC:** It's amazing to see a big group of women talking about their research.

**EL:** Thank you so much for your time.

**FL:** and **YC:** It was fun. Thank you.

# Interview with Cathy O'Neil

*Lillian Pierce, Hausdorff Center for Mathematics and Duke University*

*Cathy O'Neil earned her PhD in mathematics from Harvard in 1999 and is now a data scientist in New York City. She blogs about "exploring and venting about quantitative issues" at* Mathbabe.org.

*Cathy O'Neil*

**LP:** Tell me about your current work.

**CO:** I am a data scientist working at a small start-up. We're trying to combine consulting engagements with a new vision for data science training and education and possibly some companies to spin off. In the meantime, we're trying not to be creepy.

**LP:** Tell me a bit about your family.

**CO:** I have three kids. I got pregnant with my first son, who's thirteen now, soon after my PhD. Then I had a second child two years later, also while I was a postdoc. I also have a four-year-old, whom I had when I was working in finance.

**LP:** Did you have any notions or worries in advance about how the growth of your family would intersect with the growth of your career?

**CO:** I absolutely did worry about it, and I was right to worry about it, but I did not hesitate about whether to have children because it was just not a question to me about how I wanted my life to proceed. And I did not want to wait until I was tenured because I didn't want to risk being infertile, which is a real risk. So for me it was not an option not to do it as a woman, forget as a mathematician.

**LP:** What was it like as a postdoc with two very young children?

**CO:** On the one hand I was hopeful about it, and on the other hand I was incredibly disappointed about it. The hopeful part was that the chair of my department was incredibly open to negotiating a maternity leave for postdocs, and it really was the best maternity policy that I knew about: a semester off of teaching for each baby and in total an extra year of the postdoc, since I had two babies. So I ended up with four years of postdoc, which was really quite generous on the one hand, but on the other hand it really didn't matter at all. Not "not at all"—it mattered somewhat but it simply wasn't enough to feel like I was actually competing with my contemporaries who didn't have children. That's on the one hand completely obvious and natural and it makes sense, because when you have small children you need to pay attention to them because they need you—and at the same time it was incredibly frustrating.

**LP:** It's interesting because it's not that you were saying "I won't be able to compete with my contemporaries over the course of my life," but more "I can't compete right now."

**CO:** Exactly. "I can't compete right now" with postdocs without children. I realize—and this is not a new idea—that mathematics as a culture frontloads entirely into those three or four years after you get your PhD. Ultimately it's not my fault, it's not women's fault, it's the fault of the academic system.

**LP:** What metrics could departments use to be thinking more about future potential?

**CO:** I actually think it's hard. It's not just for women that it should change. It's for the actual culture of mathematics. Essentially, the system is too rigid. And it's not only women who get lost. The same thing that winnows the pool down right after getting a PhD—it's a whittling process, to get rid of people, get rid of people, get rid of people until you only have the elite left—that process is incredibly punishing to women, but it's also incredibly punishing to everybody. And moreover because of the way you get tenure and then stay in your field for the rest of your life, my feeling is that mathematics actually suffers. The reason I say this is because I work in industry now, which is a very different system, and

people can reinvent themselves in a way that simply does not happen in mathematics.

**LP:** Do you think industry, in terms of the young career phase, gets it closer to "right" than academia currently does?

**CO:** Much closer to right. It's a brutal place, don't get me wrong, it's brutal. I'm not saying it's a perfect system by any stretch of the imagination. But the truth is in industry you can have a three year stint somewhere that is a mistake. Forget having kids, you can have a three year stint that was just a mistake for you. You can say "I had a bad boss and I left that place and I got a new job" and people will say "Ok." They don't care. One thing that I like about it is the ability to reinvent yourself. And I don't think you see that in math. In math, your progress is charted by your publication record at a granular level. And if you're up for tenure and there's a three year gap where you didn't publish, even if in the other years you published a lot, you still have to explain that gap. It's like a moral responsibility to keep publishing all the time.

**LP:** How are you measured in industry?

**CO:** In industry it's the question "what have you done for me," "what have you done for me lately." It's a shorter-term question, and there are good elements to that. One of the good elements is that as a woman you can have a baby or a couple babies and then you can pick up the slack, work your ass off, and you can be more productive after something happens. If someone gets sick, people lower their expectations for that person for some amount of time until they recover, and then expectations are higher. Mathematics by contrast has frontloaded all of the stress, especially for the elite institutions, into the three or four years to get the tenure track offer and then the next six years to get tenure. And then all the stress is gone. I understand why people with tenure like that. But ultimately I don't think mathematics gets done better because of it. And certainly when the question arises "why don't women stay in math," I can answer that very easily: because it's not a very good place for women, at least if they want kids.

**LP:** You mention on your blog that your mother is an unapologetic nerd and computer scientist; the conclusion you drew from that was that it was natural for you not to doubt that your contributions to nerd-dom and science and knowledge would be welcomed. How do you think this experience of having a mother like that inoculated you?

**CO:** One of the great gifts that my mother gave me as a Mother Nerd was the gift of privacy—in the sense that I did not scrutinize myself. First of all she was role-modeling something for me, so if I had any expectations it would be to be like my mom. But second of all she wasn't asking me to think about that. I think that was one of the rarest things I had, the most unusual aspect of my upbringing as a girl. Very few of the girls that I know are not scrutinized. My mother was too busy to pay attention to my music or my art or my math. And I was left alone to decide what I wanted to do—it wasn't about what I was good at or what other people thought of my progress. It was all about answering the question, what did I want to do. Privacy for me is having elbow space to self-define.

**LP:** Do you think it's harder for parents to give that space to girls than to boys?

**CO:** Yes I do, I absolutely do. It's harder and for some reason it's not even thought about. My mother also gave me the gift of not feeling at all guilty about putting me into daycare. And that's one of my strongest lessons, that I don't feel at all guilty about sending my kids to daycare. In fact I recently had the daycare providers for my four-year-old all over for dinner, and I was telling them in all honesty that sometimes I wish I could be there too, that I could just stay there all day, because it's just a wonderful place to be. I'm jealous of my kids. And that's the best of all worlds. Instead of saying "oh my kid is in daycare all day, I feel bad about that," it's "my kid gets to go to daycare."

**LP:** Where did this ability not to scrutinize come from? Where did your mother get this?

**CO:** I don't know. My mother has never given me advice, she just doesn't give advice. And when I ask her to, she says "you know more about your life than I do."

**LP:** How do you deal with scrutiny now?

**CO:** It's transformed as I've gotten older. I've gotten a thicker skin, partly from working in finance. I've gotten to the point now where I can appreciate good feedback and ignore negative feedback. And that's a really nice place to be. But it started out, I believe, because I was raised in an environment where I wasn't scrutinized. And I had that space to self-define.

**LP:** The idea of pushing back against scrutiny to clear space for self-definition is inspiring for adults as well.

**CO:** Women in math, especially with kids, give yourself a break. You're under an immense amount of pressure, of scrutiny. You should think of it as being on the front lines, you're a warrior! And if you're exhausted, there's a reason for it. Please go read Radhika Nagpal's *Scientific American* blog post ("The Awesomest 7-Year Postdoc Ever") for tips on how to deal with the pressure. She's awesome. And the last thing I want to say is that I never stopped loving math. Cardinal Rule Number 1: Before all else, don't become bitter. Cardinal Rule Number 2: Remember that math is beautiful.

# Kudos (and Queries)

Hee Oh, Yale PhD 1997, has been appointed tenured professor at Yale University, effective July 2013. She had earlier taught at such prestigious institutions as Princeton, Caltech, and Brown. She is the first woman tenured in mathematics in the 312-year history of Yale.

Oh has delivered numerous invited lectures at meetings, including the 2010 International Congress of Mathematicians. AWM members may recall her plenary lecture "Counting and Equidistribution in Apollonian Circle Packing," delivered at "40 Years and Counting: AWM's Celebration of Women in Mathematics" in September 2011. She was also a panelist at the AWM and Korean Women in Mathematical Sciences (KWMS) co-sponsored event "Empowering Women Mathematicians for Excellence" in Seoul at the joint meeting of the Korean Mathematical Society and the American Mathematical Society in December 2009.

More recently, she co-organized the KIAS Summer School on Homogeneous Dynamics this July and is a co-organizer of "Geometric and Arithmetic Aspects of Homogenous Dynamics" to be held at MSRI in Spring 2015.

Now that the tenured-glass ceiling has been smashed at Yale, Christina Sormani asked some interesting follow-up questions on AWM's Facebook page: "Can we make a list of universities which haven't had a tenured woman in the mathematics department? It's 2013 already! There are plenty of tenured women mathematicians now. Are we crowding into departments that already have women?"

Congratulations to Oh! And join the AWM discussion at https://www.facebook.com/permalink.php?id=153839851326344&story_fbid=561902683853390.

*Based on info from* The Korea Times*, May 30, 2013,* http://www.koreatimes.co.kr/www/news/issues/2013/05/178_136647.html *and Oh's webpage* http://gauss.math.yale.edu/~ho2.

# 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**.

# The 2014 AAAS Meeting

*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 and is the publisher of *Science*. The AAAS is divided into 24 disciplinary-based sections, including Section A (Mathematics). The 2014 annual meeting of the AAAS will be held in Chicago on February 13–17. The theme of this year's meeting is "Meeting Global Challenges: Discovery and Innovation," and this year's meeting features sessions that explore the connections between data, privacy, and mathematics.

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:

- Your Genome: To Share or Not to Share?
- Re-Identification Risk of De-Identified Data Sets in the Era of Big Data
- The Importance of Recreational Mathematics in Solving Practical Problems
- Elections through the Lens of Mathematics

Other symposia of interest to the mathematical community include:

- People and Computing: On Human-Computer Collaborations for Tackling Hard Problems
- Transplant Organ Shortage: Informing National Policies using Management Sciences
- New Modeling Approaches to Inform Climate Change Understanding and Decision Making
- Better Understanding the Science Needed for Sustainable Urban Development
- How Big Data Supports Biomedical Discovery
- A New Era for Urban Research: Open Data and Big Computation
- Data Availability: Making Sure the Gift Keeps Giving
- STEM Education Policies and Policymaking: Pushing in the Same Direction
- Analogical Processes in STEM Learning: Unlocking the Power of Big Data by Integrating Physical, Engineering, and Life Sciences
- Statistical Methods for Large Environmental Datasets

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, continuing a multi-decade commitment to the mathematics program at the AAAS.

The AAAS Annual Meeting is the showcase of American science, with about ten thousand people attending some part of the meeting each year. The AAAS Program Committee is genuinely interested in offering symposia on topics in pure and applied mathematics. In recent years there have been symposia on subjects such as compressive sensing, multi-scale modeling of cancer, quantum computing, and the changing nature of mathematical proof.

The 2015 meeting will be February 12–15, 2015 in San Jose, CA, 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 Chicago on Friday, February 14, 2014, 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.

## Faculty Positions
### School of Operations Research & Information Engineering (ORIE)

*Cornell is a community of scholars, known for intellectual rigor and engaged in deep and broad research, teaching tomorrow's thought leaders to think otherwise, care for others, and create and disseminate knowledge with a public purpose.*

Cornell University's School of Operations Research and Information Engineering (ORIE) seeks to fill up to two tenured/tenure-track faculty positions for its Ithaca campus. Applicants with research interests in all areas of operations research and information engineering will be considered, but applicants in areas aligned with the School's current strategic plan will receive primary consideration: the plan seeks to strengthen the School's leading role in advancing the analytical, methodological, and modeling tools of operations research together with the potential of "Big Data" and the information revolution.

Requisite is a strong interest in the broad mission of the School, exceptional potential for leadership in research and education, an ability and willingness to teach at all levels of the program, and a PhD in operations research, mathematics, statistics, or a related field by the start of the appointment. Salary will be appropriate to qualifications and engineering school norms.

Cornell ORIE is a diverse group of high-quality researchers and educators interested in probability, optimization, statistics, simulation, and a wide array of applications such as manufacturing, e-commerce, supply chains, scheduling, transportation systems, health care, financial engineering, service systems and network science. We value mathematical and technical depth and innovation, and experience with applications and practice. Ideal candidates will have correspondingly broad training and interests.

Please apply online at **https://academicjobsonline.org/ajo/jobs/3039** with a cover letter, CV, statements of teaching and research interests, sample publications, list of reference letter writers and, for junior applicants, a doctoral transcript. Applications will be reviewed starting on October 1, 2013 (prior to the annual INFORMS conference); although all applications completed by November 15, 2013, will receive full consideration, candidates are urged to submit all required material as soon as possible. Applications will be accepted until the positions are filled.

ORIE and the College of Engineering at Cornell embrace diversity and seek candidates who can contribute to a welcoming climate for students of all races and genders. Cornell University seeks to meet the needs of dual career couples, has a Dual Career program, and is a member of the Upstate New York Higher Education Recruitment Consortium to assist with dual career searches. Visit **http://www.unyherc.org/home/** to see positions available in higher education in the upstate New York area. Cornell University is an equal opportunity, affirmative action educator and employer. We strongly encourage qualified women and minority candidates to apply.

Find us online at http://hr.cornell.edu/jobs or
Facebook.com/CornellCareers

*Cornell University is an innovative Ivy League university and a great place to work. Our inclusive community of scholars, students and staff impart an uncommon sense of larger purpose and contribute creative ideas to further the university's mission of teaching, discovery and engagement. Located in Ithaca, NY, Cornell's far-flung global presence includes the medical college's campuses on the Upper East Side of Manhattan and in Doha, Qatar, as well as the new CornellNYC Tech campus to be built on Roosevelt Island in the heart of New York City.*

*Diversity and inclusion have been and continue to be a part of our heritage.*
*Cornell University is a recognized EEO/AA employer and educator.*

# Association for Symbolic Logic ASL Travel Awards

**Student Travel Awards: The 2014 ASL North American Annual Meeting and other ASL or ASL-Sponsored Meetings.** The ASL will make available modest travel awards to graduate students in logic so that they may attend the 2014 ASL North American Annual Meeting in Boulder, Colorado (the announcement for travel award applications for the 2014 European Summer Meeting will be made later in the fall of 2013). Student members of the ASL also may apply for travel grants to other ASL or ASL-sponsored meetings. To be considered for a Travel Award, please (1) send a letter of application, and (2) ask your thesis supervisor to send a brief recommendation letter. The application letter should be brief (preferably one page) and should include: (1) your name; (2) your home institution; (3) your thesis supervisor's name; (4) a one-paragraph description of your studies and work in logic, and a paragraph indicating why it is important to attend the meeting; (5) your estimate of the travel expenses you will incur; (6) (for citizens or residents of the USA) citizenship or visa status; and (7) (voluntary) indication of your gender and minority status. Women and members of minority groups are strongly encouraged to apply. In addition to funds provided by the ASL, the program of travel grants is supported by a grant from the US National Science Foundation; NSF funds for meetings outside of North America may be awarded only to students at USA universities and to citizens and permanent residents of the USA. Air travel paid for using NSF funds must be in accordance with the Fly America Act. Application by email is encouraged; put "ASL travel application" in the subject line of your message.

For the 2014 ASL North American Annual Meeting, applications and recommendations should be received before the deadline of March 10, 2014, by the Program Chair: Marcia Groszek, Department of Mathematics, 6188 Kemeny Hall, Dartmouth College, Hanover, NH 03755-3551 USA; Fax: 603-646-1312; email: **marcia.groszek@dartmouth.edu**. Applications by email are preferred.

For ASL student member travel grants to ASL or ASL-sponsored meetings (other than the 2014 North American Annual Meeting and the 2014 European Summer Meeting), applications and recommendations should be received at least three months prior to the meeting at the ASL Business Office: ASL, Box 742, Vassar College, 124 Raymond Avenue, Poughkeepsie, New York 12604, USA; Fax: 1-845-437-7830; email: **asl@vassar.edu**. Decisions will be communicated at least two months prior to the meeting.

For further information about these meetings, and other ASL and ASL-sponsored meetings, visit the ASL website at https://aslonline.org/Meetings.htm.

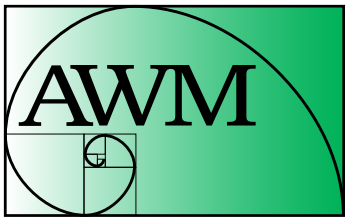
ASL, Box 742, Vassar College
124 Raymond Ave., Poughkeepsie, NY 12604
Email: asl@vassar.edu; Fax: 845-437-7830
Also visit the ASL website: http://www.aslonline.org.

# Actuarial Mathematics

Applications are invited for a tenure-track appointment in Actuarial Mathematics at the Assistant Professor level in the Department of Mathematics and Statistics of the Faculty of Science to commence July 1, 2014. The successful candidate will have completed all the requirements for a Ph.D. by this date and have a file that provides documentation of excellence (or, for very junior candidates, the promise of excellence) in both research and teaching. This candidate will also be suitable for prompt appointment to the Faculty of Graduate Studies and be capable and willing to assume a leadership role in the Department's actuarial program. The ideal candidate will be a Fellow of one of the following professional societies: Canadian Institute of Actuaries (CIA), Society of Actuaries (SoA), Casualty Actuarial Society (CAS), Faculty and Institute of Actuaries (FIA), Institute of Actuaries of Australia (IAA). Candidates willing to commit to prompt achievement of Associate status, followed by Fellowship will also be considered.

All positions at York are subject to budgetary approval. Applications must be received by January 6, 2014. Applicants should post their curriculum vitae, an outline of their research plan and a description of teaching interests on MathJobs.org. They should also arrange for three letters of recommendation (one of which should address teaching) to be sent there. Questions regarding application procedures for this position should be directed to Susan Rainey at srainey@yorku.ca.

York University is an Affirmative Action Employer. The Affirmative Action Program can be found on York's website at www.yorku.ca/acadjobs or a copy can be obtained by calling the affirmative action office at 416-736-5713. All qualified candidates are encouraged to apply; however, Canadian citizens and Permanent Residents will be given priority.




ASSOCIATION FOR
WOMEN IN MATHEMATICS

## 2013–2014 Rates: Institutions

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Category 1 ..... $325

Category 2 ..... $325

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

# ADVERTISEMENTS

**BINGHAMTON UNIVERSITY—Department of Mathematical Sciences—**The Department of Mathematical Sciences at Binghamton University invites applications for a tenure-track position in statistics at the rank of assistant professor beginning Fall 2014. We are especially interested in expertise in Big Data, machine learning, functional data a nalysis, optimization, networks or Bayesian computing. This position is funded through the Smart Energy Transdisciplinary Area of Excellence (SETAE), a recently established research cluster at Binghamton University. For a description follow the link http://www.binghamton.edu/academics/provost/tae2013.html. SE- TAE advances energy-related research and scholarship in which Binghamton University has significant existing strength and can achieve international prominence. The successful candidate is expected to contribute research time to this mission. The cluster will provide excellent opportunities for collaboration on diverse projects. Two members of SETAE will sit on the search committee. Applicants must apply electronically at http://www.mathjobs.org. Applications received before **January 5, 2014** are guaranteed full consideration. The position will remain open until filled. Binghamton University is an equal opportunity/affirmative action employer.

**BOSTON UNIVERSITY—Department of Mathematics and Statistics—**Tenure Track Position—Statistics—The Department of Mathematics and Statistics at Boston University invites applications at the tenure-track Assistant Professor level in Statistics. Ph.D. required salary commensurate with experience. The position will begin in Fall 2014, subject to final budgetary approval. Strong commitment to research and teaching at the undergraduate and graduate levels is essential. Please send a cover letter, CV, research statement, teaching statement, and at least four letters of recommendation, one of which addresses teaching, to Statistics Search, Department of Mathematics and Statistics,Boston University, 111 Cummington Mall, Boston, MA 02215. Alternatively, submit all materials to mathjobs.org. Application Deadline **December 15, 2013**. Boston University is an Affirmative Action, Equal Opportunity Employer.

**BOSTON UNIVERSITY—Department of Mathematics and Statistics**—Postdoctoral Position—Dynamical Systems—The Department of Mathematics and Statistics, at Boston University, invites applications for a three-year post-doctoral position in Dynamical Systems, starting July 2014 pending final budgetary approval. Strong commitment to research and teaching is essential. Submit AMS cover sheet, CV, research statement, teaching statement and at least four letters of recommendation, one of which addresses teaching, to mathjobs.org. Alternatively, send all material to Dynamical Systems Postdoctoral Search Committee, Department of Mathematics and Statistics, Boston University, 111 Cummington Mall, Boston, MA 02215. Application Deadline **December 15, 2013**. Boston University is an Affirmative Action/Equal Opportunity Employer.

**DARTMOUTH—**John Wesley Young Research Instructorships, 2-3 years, new or recent Ph.D. graduates whose research overlaps a department member's. Teach 3 ten-week courses spread over 3 terms. Appointment for 26 months, with possible 12 month renewal; monthly salary of $5,100, including two-month research stipend for Instructors in residence during 2 of 3 summer months; if not in residence, salary adjusted accordingly. To initiate an application go to http://www.mathjobs.org – Position ID: JWY #4928. You can also access the application through a link at http://www.math.dartmouth.edu/activities/recruiting/. General inquiries can be directed to Tracy Moloney, Administrator, Department of Mathematics, tfmoloney@math.dartmouth.edu. Applications completed by **January 5, 2014** considered first. Dartmouth College is committed to diversity and strongly encourages applications from women and minorities.

**DAVIDSON COLLEGE—**The Department of Mathematics at Davidson College invites applications for a two-year teaching postdoctoral position at the Visiting Assistant Professor level to begin August 1, 2014. Candidates must be committed to outstanding teaching and continuing scholarly activity. The teaching load is 4 semester courses per year. Davidson is strongly committed to achieving excellence and cultural diversity, and welcomes applications from women, members of minority groups, and others who would bring additional dimensions to the college's mission. See https://jobs.davidson.edu<https://jobs.davidson.edu/ to apply. Applications received by **Nov. 30, 2013**, will receive fullest consideration.

**GEORGIA TECH—**The School of Mathematics at Georgia Tech is accepting applications for faculty positions at all ranks and in all areas of Pure and Applied Mathematics and Statistics. Applications by highly qualified candidates, and especially those from groups underrepresented in the mathematical sciences, are particularly encouraged. See www.math.gatech.edu/resources/employment for more details and application instructions.

**IOWA STATE UNIVERSITY—Asst. Prof Openings—**Three Asst. Prof positions starting 8/16/14: Math Biology, Discrete Math, Probability & Statistics (split appt w/ Stats). See http://www.math.iastate.edu/jobs.html and apply at https://www.mathjobs.org/jobs. Apps **Due 11/30/13**.

**NEW MEXICO STATE UNIVERSITY—**Tenure-track Assistant Professors—The Department of Mathematical Sciences (www.math.nmsu.edu/) expects to fill two tenure-track positions at the Assistant Professor level, beginning August, 2014. Research priorities are 1) Statistics, 2) Analysis and 3) Commutative Algebra. Exceptional applicants in other areas that complement department strengths may be considered. Qualifications include a PhD in Mathematics or a related area, demonstrated excellence in teaching, and outstanding research potential. Applicants must include a completed AMS cover sheet, curriculum vitae and at least three letters of recommendation. Please submit all application materials online at http://www.mathjobs.org. Email inquiries should be addressed to mathsearch@math.nmsu.edu. See also http://www.nmsu.edu/~personel/postings/faculty. NMSU is an equal opportunity/affirmative action employer and encourages applications from women and minorities.

**NORTH CAROLINA STATE UNIVERSITY —**The Mathematics Department at North Carolina State University invites applications for tenure-track positions beginning Fall 2014, depending on the availability of funding. We are seeking exceptionally well-qualified individuals with research interests compatible with those in the department, and in particular in areas of numerical linear algebra, or control; operations research; Personalized Medicine/Mathematical modeling and health system analysis. For position requirements please see listings on mathjobs.org. The Department of Mathematics has strong research programs in applied and pure mathematics. Information about the department is available at http://www.math.ncsu.edu. Submit your application materials at http://www.mathjobs.org/jobs/ncsu. You will then receive instructions to complete a faculty profile at http://jobs.ncsu.edu using the link in the posting. AA/EOE. NC State welcomes all persons without regard to sexual orientation. The College of Sciences welcomes the opportunity to work with candidates to identify suitable employment opportunities for spouses or partners. Priority will be given to applications received by **15 November 2013**.

**NORTHEASTERN UNIVERSITY—Department of Mathematics—**Assistant/Associate Professor—Pure Mathematics Tenure-Track Position —The Department of Mathematics at Northeastern University invites applicants for one or more tenure-track positions at the Assistant/Associate Professor level, Associate Professor level is preferred, in Pure Mathematics to start as early as September of 2014. Appointments are based on exceptional research contributions in Mathematics combined with strong commitment and demonstrated success in teaching. Applications from those with an interest and ability to connect across units in the university to the advantage of research at the interface of mathematics and other disciplines are a top priority. Outstanding candidates with research in combinatorics, geometry, topology, and analysis are encouraged to apply. Candidates must have a Ph.D. in Mathematics or a related field by the start date, strong record of research, and demonstrated evidence of excellent teaching ability. Responsibilities will include teaching undergraduate and graduate courses, mentoring students and conducting an independent research program. Review of applications will begin immediately. Complete applications received by **October 31, 2013** will be guaranteed full consideration. Please be sure to include 3 references, a teaching statement, and a research statement. To apply, visit "Careers

at Northeastern" at https://neu.peopleadmin.com. Click on "Full-time Faculty Positions" and search for the current position under the College of Science. You can also apply by visiting the College of Science website at http://www.northeastern.edu/cos and clicking on the "Faculty Positions" button. Northeastern University is an Equal Opportunity, Affirmative Action Educational Institution and Employer, Title IX University. Northeastern University particularly welcomes applications from minorities, women and persons with disabilities. Northeastern University is an E-Verify Employer.

**NORTHEASTERN UNIVERSITY—Department of Mathematics**—Assistant/Associate Professor Applied Mathematics Tenure-Track Position—The Department of Mathematics at Northeastern University invites applicants for one or more tenure-track positions at the Assistant/Associate Professor level, Associate Professor level is preferred, in Applied Mathematics to start as early as September of 2014. Appointments are based on exceptional research contributions in Mathematics combined with strong commitment and demonstrated success in teaching. Applications from those with an interest and ability to connect across units in the university to the advantage of research at the interface of mathematics and other disciplines are a top priority and the expectation is this would result in building an applied cluster. Outstanding candidates with research in discrete and computational mathematics, fluid dynamics, and probability/statistics are encouraged to apply. Candidates must have a Ph.D. in Mathematics or a related field by the start date, strong record of research, and demonstrated evidence of excellent teaching ability. Responsibilities will include teaching undergraduate and graduate courses, mentoring students and conducting an independent research program. Review of applications will begin immediately. Complete applications received by **October 31, 2013** will be guaranteed full consideration. Please be sure to include 3 references, a teaching statement, and a research statement.

To apply, visit "Careers at Northeastern" at https://neu.peopleadmin.com. Click on "Full-time Faculty Positions" and search for the current position under the College of Science. You can also apply by visiting the College of Science website at http://www.northeastern.edu/cos and clicking on the "Faculty Positions" button. Northeastern University is an Equal Opportunity, Affirmative Action Educational Institution and Employer, Title IX University. Northeastern University particularly welcomes applications from minorities, women and persons with disabilities. Northeastern University is an E-Verify Employer.

**UNIVERSITY OF CALIFORNIA, IRVINE—Department of Mathematics—**Irvine, CA 92697-3875—Job #6425—Assistant Professor position in Mathematics—The Department of Mathematics at the University of California, Irvine, is seeking outstanding candidates to fill one tenure-track position to start July 1, 2014. Applicants must hold a Ph.D. and should have demonstrated excellence in research and teaching. We encourage applications from any area in pure and applied mathematics. The level of appointment will be commensurate with qualifications and experience. Applications are welcome at any time. The review process starts **December 1, 2013**, and will continue until the position is filled. Completed applications must be submitted through www.mathjobs.org and must contain (1) AMS cover sheet (2) Curriculum Vitae (3) Cover letter (4) Research statement (5) Teaching statement (6) Selected reprints and/or preprints (7) At least three reference letters (at least one addressing teaching) sent electronically through www.mathjobs.org. Instructions for the electronic application process can be found at http://www.mathjobs.org. **Indicate your area of mathematical specialization in field labeled "Area of Specialization"—example: "Algebra."** UCI is an equal opportunity employer committed to excellence through diversity and strongly encourages applications from all qualified applicants, including women and minorities.

**UNIVERSITY OF CALIFORNIA, SANTA BARBARA—**The Department of Statistics and Applied Probability invites applications for a tenure track Assistant Professor position in Statistics, starting July 1, 2014. Qualifications: research and teaching excellence and PhD in Statistics, biostatistics and related fields. Preference will be given for research on methodology and applications relating to biometrics or environmental science. To apply submit resume, statement of research, teaching objectives and have four letters of reference sent (at least one of which is directed towards teaching). Materials should electronically via: UC Recruit https://recruit.ap.ucsb.edu/apply/JPF00251. Review of applications begins **November 30th, 2013** and continues until the position is filled. Early applications are encouraged. An EO/AA employer. Additional information: http://www.pstat.ucsb.edu/employment.htm. The 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.

**UNIVERSITY OF CONNECTICUT—Department of Mathematics—**Assistant Professor—Probability/Analysis—The Department of Mathematics at the University of Connecticut invites applications for two tenure-track Assistant Professor positions beginning in Fall 2014, at the Storrs campus. The fields of the search are probability and analysis. Candidates for the rank of Associate professor or Full Professor may be considered in exceptional cases. The successful candidate will be expected to teach mathematics courses at all levels and to develop a vigorous externally funded research program. **Minimum Qualifications:** A Ph.D. or an equivalent foreign degree in mathematics or a closely related area by August 22, 2014, demonstrated evidence of excellent teaching and outstanding research. **Preferred Qualifications:** Research excellence in a priority area of the search with the potential to attract external funding, and the ability to contribute through research, teaching and/or public engagement to the diversity and excellence of the learning experience at UConn. The review of applications will begin on **December 1, 2013** and will continue until the position is filled. Apply online at http://www.mathjobs.org/jobs, including at least four letters of reference, one of which addresses the applicant's teaching. Questions or requests for further information should be sent to the Hiring Committee at mathhiring@uconn.edu. The University of Connecticut is an EEO/AA employer and actively solicits applications from minorities, women, and people with disabilities.

**UNIVERSITY OF NEBRASKA-LINCOLN—**The Department of Mathematics at the University of Nebraska-Lincoln invites applications for the following positions: (1) one tenure-track Assistant Professor position in Scientific Computing/Computational Mathematics. Review of applications will begin **November 15, 2013** and continue until a suitable candidate is found. (2) one Professor of Practice position, at the Assistant Professor Level, to be the Director of the First Year Mathematics Program. Review of applications will begin December 1, 2013 and continue until a suitable candidate is found. (3) one or more postdoctoral positions. Review of applications will begin **December 1, 2013** and continue until a suitable candidate (or candidates) is found. Each of these positions begins August 2014. For more information about these positions and information on how to apply for them, please go to: http://www.math.unl.edu/department/jobs/. The University of Nebraska is committed to a pluralistic campus community through affirmative action, equal opportunity, work-life balance and dual careers.

**UNIVERSITY OF OREGON—Assistant Professor—**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 or closely related field. An established outstanding research record, and active participation and 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: **December 15, 2013**. Candidates should have the ability to work effectively with a diverse community. The University of Oregon is an EO/AA/ADA institution committed to cultural diversity.

# ADVERTISEMENTS

**UNIVERSITY OF OREGON—Faculty Positions in Quantitative Biology—**The Departments of Biology (http://biology.uoregon.edu) and Mathematics (http://math.uoregon.edu) at the University of Oregon announce a cluster hire of up to three tenure-related faculty positions in Fall 2014. One of these positions may be at the level of Associate or Full Professor with indefinite tenure. These hires are part of an integrated effort to strengthen research and scholarship at the nexus of statistics/mathematics and biology at the University of Oregon, and will serve as a catalyst for future growth in this area. We are broadly interested in recruiting candidates working in areas developing statistical methodology related to the life sciences. Examples of these areas include, but are not limited to, statistical analysis of large data sets, algorithms for analyzing sequence data, systems biology, mathematical models for cell biology, and stochastic/mathematical models for neuroscience, population genomics and molecular evolution. Successful candidates will bolster our emerging strengths in biomathematics, maintain an outstanding research program that focuses on solving core problems in this area, and have a commitment to excellence in teaching. Ph.D. required. Position responsibilities include undergraduate teaching. Interested persons should apply online to the MATHBIO SEARCH, University of Oregon at https://www.mathjobs.org/jobs/jobs/5179. Applicants should submit a cover letter, a curriculum vitae including a publication list, a statement of research accomplishments and future re-search plans, a description of teaching experience and philosophy, and three letters of recommendation. Ideally the research description and at least one of the letters of recommendation would include descriptions of the statistical/mathematical tools or models used in the applicant's research. To ensure consideration, application materials should be uploaded by **November 15th, 2013**, but the search will remain open until the positions are filled. Women and minorities are encouraged to apply. The University of Oregon is an Equal Opportunity/Affirmative Action Institution committed to cultural diversity and compliance with the Americans with Disabilities Act, and supportive of the needs of dual career couples. We invite applications from qualified candidates who share our commitment to diversity.

**UNIVERSITY OF OREGON—Visiting Assistant Professor** (non-tenure related) The University of Oregon department of mathematics seeks applicants for two post-doctoral Visiting Assistant Professors. These are full-time positions renewable for up to three years and are not tenure-related. Minimum qualifications for the postdoctoral positions 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 https://www.mathjobs.org/jobs/jobs/5236. First consideration will be given to applications received by **January 31, 2014**. The positions will remain open until filled. Candidates should have the ability to work effectively with a diverse community. The University of Oregon is an EO/AA/ADA institution committed to cultural diversity.

**UNIVERSITY OF PENNSYLVANIA—**The School of Arts and Sciences at the University of Pennsylvania seeks to add to the faculty of our newly formed Evolution Cluster. We invite applicants for a tenure-track assistant professor appointment in evolution, broadly interpreted. We are interested in exceptional scientists who will establish a research program to empirically study the evolution of dynamical processes using field or laboratory experiments or the construction and analysis of massive data sets. Areas of interest include, but are not limited to: the evolution of neural, social, ecological or linguistic dynamics and networks; evolution of early life or exobiology; biochemical, neuronal, or cooperative interactions and exchange of information at the molecular, cellular, human, or ecosystems scales; directed evolution of organisms or processes; analyzing extant structures and networks, from molecules to populations, along with their evolutionary trajectories, including the development of new modalities to extract data from the geologic, genetic, or linguistic historical records. The successful candidate's primary appointment will be in a single department in the natural sciences: Biology, Chemistry, Earth and Environmental Science, Linguistics, Mathematics, Physics and Astronomy, or Psychology. Secondary appointments in other departments can be arranged, as appropriate. The successful candidate will have a strong interest in building a program that generates interaction with researchers from other disciplines who are working within the overarching theme of evolution and will teach courses in his or her home department and participate in the development of curricula pertinent to the Evolution Cluster (See http://evolutioncluster.sas.upenn.edu for more information). The University of Pennsylvania is an Affirmative Action/Equal Opportunity Employer and is strongly committed to establishing a diverse faculty: http://www.upenn.edu/almanac/volumes/v58/n02/diversityplan.html Applications should be submitted on-line at http://facultysearches.provost.upenn.edu/postings/23 and include a curriculum vitae, a research statement that includes the candidate's perspective on how she or he fits into one of the core departments, links to no more than three journal publications, and the contact information for three individuals who will provide letters of recommendation. Review of applications will begin **1 November 2013** and will continue until the position is filled.

**UNIVERSITY OF PENNSYLVANIA—Nontenure-Track Junior Position—**Hans Rademacher Lecturer of Mathematics—At least one position will be available beginning July 1, 2014. Candidates should have a strong research program and will participate in the Department's undergraduate and graduate teaching mission. The initial full-time appointment will be for one year with annual renewal up to two additional years contingent on performance review. The Department of Mathematics is strongly committed to \Penn's Action Plan for Faculty Diversity and Excellence and to establishing a diverse faculty (for more information see: http://www.upenn.edu/almanac/volumes/v58/n02/diversityplan.html. Applications should be submitted online through www.mathjobs.org and include the following items: cover letter, curriculum vitae, research statement, teaching statement, publication list and at least 3 reference letters from mathematicians familiar with your work (one of these should comment on your teaching ability). For further information, please contact personnel@math.upenn.edu or Personnel Committee, Department of Mathematics, University of Pennsylvania, Philadelphia, PA 19104-6395. The University of Pennsylvania is an affirmative action/equal opportunity employer.

**UNIVERSITY OF TORONTO—**The Department of Mathematics at St. George campus, University of Toronto, invites applications for a tenure-stream appointment at the rank of Assistant Professor. Candidates with research expertise in Geometry and Number Theory will be given preference; however, exceptional candidates in any field of mathematics are encouraged to apply. The expected start date of the appointment is July 1, 2014. All qualified candidates are invited to apply by clicking the following link https://www.mathjobs.org/jobs/jobs/5117. To receive full consideration, applications should be received by **December 17, 2013**. The University of Toronto is strongly committed to diversity within its community and especially welcomes applications from visible minority group members, women, Aboriginal persons, persons with disabilities, members of sexual minority groups, and others who may contribute to the further diversification of ideas. All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority.

**UNIVERSITY OF TORONTO—**The Department of Mathematics, University of Toronto, invites applications for a tenured appointment at the rank of Associate or Full Professor. The successful candidate will also be appointed as Associate Faculty at the Perimeter Institute for Theoretical Physics (Waterloo, Ontario). The expected start date of the appointment is July 1, 2014. All qualified candidates are invited to apply by clicking the following link https://www.mathjobs.org/jobs/jobs/5038. To receive full consideration, applications should be received by **January 15, 2014**. The University of Toronto is strongly committed to diversity within its community and especially welcomes applications from visible minority group members, women, Aboriginal persons, persons with disabilities, members of sexual minority groups, and others who may contribute to the further diversification of ideas. All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority.

# ADVERTISEMENTS

**UNIVERSITY OF WISCONSIN—**Department of Biostatistics & Medical Informatics at the University of Wisconsin School of Medicine & Public Health, and Morgridge Institute for Research, seek Assistant (tenure-track) or Associate/Full (tenured) Professor in biostatistics or bioinformatics. Innovative position combines research in methodology with applications in virology; includes teaching, graduate student training. PhD in Biostatistics, Statistics, Bioinformatics, Computational Biology, Biomedical Informatics, Computer Sciences, or related area. Please see: http://www.biostat.wisc.edu/About/Jobs/BMI-MIR-Ad-2013-final.pdf. AA/EOE

**WASHINGTON UNIVERSITY IN ST. LOUIS—Department: Mathematics—**Employer Type: Academic—Type of Position: Tenure-Track Faculty—Subject Area: Mathematics – Geographic Location: Missouri – Application Deadline: October 30, 2013 – Contact Person: David Wright, Chair – Address: Department of Mathematics, Washington University, One Brookings Drive, Campus Box 1146, St. Louis, MO. 63130 – E-mail Address: wright@math.wustl.edu. The Mathematics Department of Washington University in St. Louis, MO, has one opening for a tenure-track Assistant Professor in pure mathematics, to begin August 2014. Responsibilities include teaching three one semester courses per year, maintaining a strong research program, publishing the results of the research, and normal student advising and departmental and university service. Mathematicians in all areas will be considered. A Ph.D. in mathematics is required. Applicants should provide their CV, publication list, research and teaching statements, and arrange for four letters of recommendation to be submitted. At least one of the letters should report on the applicant's teaching abilities. Applicants are encouraged to submit this material using the AMS mathjobs website (https://www.mathjobs.org/jobs/jobs/5023); however it may be sent directly to the Chair, Department of Mathematics. The department will begin reviewing applications on **October 30, 2013**, and continue until the position is filled. Washington University is an affirmative action/equal opportunity employer and specifically invites and encourages women and minorities to apply. Employment eligibility verification required on hire. For more information about the position or the department, visit wumath.wustl.edu.

**WASHINGTON UNIVERSITY IN ST. LOUIS—Department: Mathematics—**Employer Type: Academic—Type of Position: Tenure-Track Faculty—Subject Area: Statistics—Geographic Location: Missouri Application Deadline: January 15, 2014 – Contact Person: David Wright, Chair Address: Department of Mathematics, Washington University in St.Louis, One Brookings Drive, Campus Box 1146, St. Louis, MO 63130 – E-mail Address: wright@math.wustl.edu. The Mathematics Department of Washington University in St. Louis, MO, has one opening for a tenure track Assistant Professor in Statistics, to begin Fall Semester 2014. Responsibilities include teaching three one semester courses per year, maintaining a strong research program, publishing the results of the research, and normal student advising and departmental and university service. Statisticians in all areas will be considered. A Ph.D. in statistics or related field is required. Applicants should provide their CV, publication list, research and teaching statements, and arrange for four letters of recommendation to be submitted. At least one of the letters should report on the applicant's teaching abilities. Applicants are encouraged to submit this material using the AMS mathjobs website at https://www.mathjobs.org/jobs/jobs/5180; however it may be sent directly to the Chair, Department of Mathematics. The department will begin reviewing applications on **October 30, 2013**, and continue until the position is filled. The deadline for completed applications, including letters of recommendation, is **January 15, 2014**. Washington University is an affirmative action/equal opportunity employer and specifically invites and encourages women and minorities to apply. Employment eligibility verification required on hire. For more information about the position or the department, visit wumath.wustl.edu.

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ASSOCIATION FOR WOMEN IN MATHEMATICS

Volume 43, Number 6, November–December, 2013

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