

ASSOCIATION FOR
WOMEN IN MATHEMATICS

Newsletter

VOLUME 42, NO. 4 • JULY–AUGUST 2012

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

- | | |
|----|-------------------------------------|
| 4 | King Named Falconer Lecturer |
| 5 | AWM Essay Contest |
| 8 | 2011 Newsletter Thank-yous |
| 8 | Education Column |
| 11 | Media Column |
| 16 | Book Review |
| 18 | Dedicated to Estelle |
| 20 | Accomplishments |
| 21 | Statement on <i>Engage to Excel</i> |

PRESIDENT'S REPORT

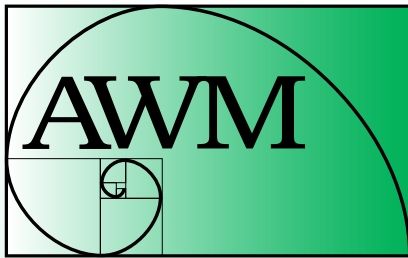
It is Memorial Day weekend, and I write to share the news of the AWM Executive Committee budget discussions and of the latest activities of some of the Portfolio committees.

Outreach and Professional Activities. The second USA Science and Engineering Festival came to the Washington, D.C. Convention Center in mid-April. AWM was among thousands of exhibitors for the two-day event that crowded the three city blocks of space the convention center occupies. I was there on Saturday, April 28. The AWM exhibit on fractals in nature and mathematics was designed and organized by the team whose NSF grant supported our expenses: Irina Mitrea, Tai Melcher, and Katharine Ott. Irina's niece, Diana Mitrea, designed graphics for the booth and also volunteered both days. I met some amazing kids and their families. I would like to thank all the volunteers who made this possible. An article in a later issue of this newsletter will identify them and provide more details about this wonderful event.

AWM recently responded to two requests from national boards and committees to contribute written and/or verbal testimony. The Policy and Advocacy Committee (with the able assistance of Cathy Kessel) prepared a written response to the February 7 PCAST report, and P&A member Rebecca Goldin, representing AWM, gave testimony at the March meeting of PCAST (the President's Council of Advisors on Science and Technology). The response, endorsed by the AWM Executive Committee, appears on the website and in this issue on pages 21–23. Other professional societies have also responded, and you'll find links to all of them on the AWM web site. Early in May, the NRC gave AWM the opportunity to submit written testimony for a conference hosted by the National Academies. The *Seeking Solutions: Maximizing American Talent by Advancing Women of Color in Academia* conference, June 7–8, 2012, brings together academic administrators, federal officials and policy makers to “engage in discussions aimed at increasing the representation and career advancement of women of color in academic science, engineering and medicine.” The members of the AWM Executive Committee contributed to a short article, drafted by Ruth Charney, which included the following key recommendations: support for conferences and workshops aimed at women of color, the creation of awards and named lectures to celebrate the achievements of women of color, and advocacy for policies addressing work-life balance issues.

Many members of AWM participated in the 2012 Infinite Possibilities Conference at the University of Maryland, Baltimore County. Mary Gray, the

continued on page 2



ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM was founded in 1971 at the Joint Meetings in Atlantic City.

The *Newsletter* is published bi-monthly. Articles, letters to the editor, and announcements are welcome.

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

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President's Report *continued from page 1*

first president of AWM, described some of the activist history of AWM at a plenary session. Trachette Jackson, AWM Executive Committee, gave one of the keynote addresses. For more information about this annual event, see <http://www.ipcmath.org/>.

AWM Committee Activities. The Awards and Prizes committee has been occupied with the important issue of whether and how to create additional AWM prizes. At present, AWM offers three prizes: the Hay Award, the Humphreys Award, and the Schafer Prize. The Schafer Prize is more than two decades old and the Humphreys Prize is two years old. We asked the Awards and Prizes committee to discuss and make a recommendation on whether AWM should create additional prizes and if so, to deliberate on how and where to award them as well as on the financial resources required to sustain them for some period of time. The committee, in consultation with past and present AWM officers, has made a recommendation and we look forward to announcing the details soon.

The committee considered several factors regarding competitive prizes in mathematics. It is a fact that women are very underrepresented in receiving awards and prizes in mathematics overall. To take a single example (of many possible), the Salem Prize in Fourier Analysis has been awarded annually since 1968, sometimes to multiple winners, yet it was not until 2006 that a woman (Stefanie Petermichl, University of Toulouse) won this prize. At the same time, it is clear that prizes can be career-changing events. They can be integral to a job offer or a promotion. A former Alice T. Schafer Prize winner told me that her award convinced her to stay in mathematics. It therefore seems advantageous to increase the number of awards in the profession and to offer more opportunities to recognize achievements.

National Academy of Sciences. Hearty congratulations to Ruth J. Williams, Charles Lee Powell Distinguished Professor, Department of Mathematics, University of California, San Diego, on her election to the NAS in May. 84 new members and 21 foreign associates from 15 countries were elected in recognition of their distinguished and continuing achievements in original research. Ruth's research interests are in the areas of probability theory, stochastic processes and their applications.

Looking ahead to JMM 2013. At JMM 2013, the AWM workshop will have two main components: a poster session for graduate students in any field of mathematics and a special session in number theory and algebra. From now on, the short talks at the AWM JMM workshop will be focused in some research area, a different one each year. While the research area will be fairly broad, we anticipate that a focus for the workshop will enhance the impact for the speakers, for their mentors, and for the audience. The 2012 and 2013 JMM workshops are funded by a grant from the National Security Agency. Partial support for both students and workshop speakers will be available.

Financial update. We are happy to report that the fiscal year 2011–2012 is projected to end with a positive cash flow. This good news is due primarily to a few singular events, including an increase in sponsorship and donations in our 40th anniversary year and unusual savings in staff expenses. Advertising revenue has risen from its low in 2009. We are unable, however, to project a balanced budget for the 2012–2013 fiscal year on the basis of currently forecast revenue. The primary

reason for this is the decline in staff support from the grants that AWM receives to run its programs. Like many non-profits, AWM does not meet its operating costs from membership dues and revenue alone. Unlike other mathematical professional societies, AWM does not receive revenue from journal subscriptions. The organization relies on additional voluntary contributions, sponsorships and staff support from grants. A financial task force, led by our new treasurer, Ellen Kirkman, has been formed to review operational costs and recommend further action.

Members and Liaisons. This summer, AWM will launch a program inviting members to become liaisons to their academic or professional unit. A liaison will communicate important news from AWM to their professional peers and chairs or supervisors, such as calls for nominations or announcements of funding opportunities. We hope that the liaison program will increase involvement in AWM activities and events as well as bring new institutional members to AWM.

Membership renewal takes place in the fall. We invite you to consider becoming a contributing member. Contributing members provide us with critical additional support for our many wonderful programs and for the leadership AWM provides in policy and advocacy. In addition, a contributing member can nominate one student each year for free membership.

Finally, thanks to our members who follow us on FaceBook and post useful links and information. We value your support!

Sincerely,



Jill Pipher
Providence, RI
May 29, 2012



Jill Pipher

Membership Dues

Membership runs from Oct. 1 to Sept. 30

Individual: \$65 **Family:** \$30

Contributing: \$150

New member, affiliate and reciprocal members, retired, part-time: \$30

Student, unemployed: \$20

Outreach: \$10

Foreign memberships: \$10 add'l. for postage
Dues in excess of \$85 and all contributions are deductible from federal taxable income when itemizing.

Institutional Membership Levels

Category 1: \$325

Category 2: \$325

Category 3: \$200

Category 4: \$175

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

Sponsorship Levels

α **Circle:** \$5000+

β **Circle:** \$2500–\$4999

Other levels available.

See the AWM website for details.

Subscriptions and Back Orders

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

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

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

Newsletter Deadlines

Editorial: 24th of January, March, May, July, September, November

Ads: Feb. 1 for March–April, April 1 for May–June, June 1 for July–Aug., Aug. 1 for Sept.–Oct., Oct. 1 for Nov.–Dec., Dec. 1 for Jan.–Feb.

Addresses

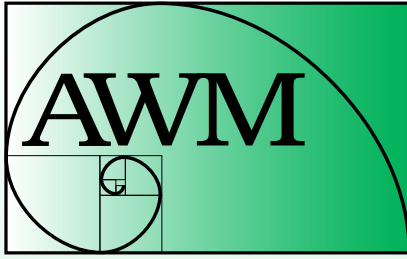
Send all queries and all *Newsletter* material except ads and material for media and book review columns to Anne Leggett, leggett@member.ams.org. Send all book review material to Marge Bayer, bayer@math.ku.edu. Send all media column material to Sarah Greenwald, greenwaldsj@appstate.edu and Alice Silverberg,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

**IT'S MY
VOTE**

I WILL BE HEARD
AAUW ACTION FUND

Women wield great power in American politics. More than ever before, women are registering to vote and casting ballots in greater numbers and with more consistency than men. We are a powerful and influential bloc of voters.

But as we look forward to Election Day 2012, we know that we have to do more—more education, more outreach, more voter registration, and more mobilization. That's why the AAUW Action Fund is gearing up for a high-energy, high-return nonpartisan campaign that will mobilize women voters, especially young women of the millennial generation. By engaging with millennial women, we have the opportunity to support an enormous generation of young women in establishing lifelong voting habits and to strengthen the voice of women in the 2012 elections. For more info, visit www.aauw.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 Workshop at JMM:
August 1, 2012

AWM Alice T. Schafer Prize:
October 1, 2012

NSF-AWM Travel Grants:
October 1, 2012 and February 1, 2013

AWM Noether Lecture:
October 15, 2012

AWM-SIAM Kovalevsky Lecture:
November 1, 2012

Ruth I. Michler Memorial Prize:
November 1, 2012

AWM Workshop at SIAM:
November 1, 2012

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Karen D. King Named 2012 Falconer Lecturer

The Association for Women in Mathematics and the Mathematical Association of America are pleased to announce that **Karen D. King** will deliver the Falconer Lecture at MathFest 2012. Dr. King is the Director of Research for the National Council of Teachers of Mathematics (NCTM).

King earned her BS in Mathematics from Spelman College and her PhD in Mathematics Education from the University of Maryland under the supervision of Dr. Patricia F. Campbell.

Prior to becoming Director of Research for NCTM King was an associate professor of mathematics education at the New York University Steinhardt School of Culture, Education and Human Development. She served as a program director at the National Science Foundation in the Division of Elementary, Secondary, and Informal Education. She has held positions in mathematics education at San Diego State University and Michigan State University.

Her current research focuses on urban mathematics reform, the mathematics preparation of elementary and secondary teachers, and the policies of mathematics teacher professional development. She has been the principal investigator or co-principal investigator of several National Science Foundation grants and published numerous articles, book chapters, and a recently co-edited book titled *Disrupting Tradition: Research and Practice Pathways in Mathematics Education* with William Tate, IV and Celia Rousseau Anderson. She is a member of the writing team for the revision of *The Mathematical Education of Teachers*.

King has served as associate editor of the *Journal for Research in Mathematics Education* and was a member of a RAND Mathematics Study Panel, which made recommendations to the U.S. Department of Education about future research funding in mathematics education. She serves on numerous committees focusing on research in mathematics education and teacher education with national organizations, including the Association of Mathematics Teacher Educators, the Benjamin Banneker Association, and the National Board for Professional Teaching Standards.

King's lecture at MathFest is entitled "Because I Love Mathematics: The Role of Disciplinary Grounding in Mathematics Education." She will discuss the recent focus in K-12 mathematics education on the Standards for Mathematical Practice in the Common Core State Standards in Mathematics and the need for teachers and students to be grounded in the reasoning habits of mathematics to ensure opportunities for future students to learn mathematics at the highest levels.



Karen D. King, 2012 Falconer Lecturer

MathFest 2012 will be held August 2–4 in Madison, WI. The Falconer lectures were established in memory of Etta Z. Falconer (1933–2002). Her many years of service in promoting mathematics at Spelman College and efforts to enhance the movement of minorities and women into scientific careers through many forums in the mathematics and science communities were extraordinary. Falconer lecturers are women who have made distinguished contributions to the mathematical sciences or mathematics education. Recent recipients of this honor include Dawn Lott, Ami Radunskaya, Kate Okikiolu, Rebecca Goldin, Katherine St. John and Trachette Jackson.

AWM Essay Contest

Congratulations to all the winners of the 2012 AWM Essay Contest: Biographies of Contemporary Women in Mathematics! Many thanks to Heather Lewis, Nazareth College, contest organizer, for coordinating the judging, and to the committee that does the matching (of students to subjects) and the judging. We are also grateful to Math for America for their sponsorship of this contest. The essay contest is intended to increase awareness of women's ongoing contributions to the mathematical sciences by inviting students from sixth-graders through college seniors to write biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers.

The 2012 Grand Prize essay appears after the list of this year's winners. Congratulations to all! To see the other prize-winning essays, visit <http://www.awm-math.org/biographies/contest/2012.html>.

Grand Prize Winner

“Dr. Mythily Ramaswamy: Making a Difference, One Equation at a Time”

Gitanjali Lakshminarayanan, Vanguard High School, Ocala, FL

(The essay was about Dr. Mythily Ramaswamy of Tata Institute of Fundamental Research, Math Center in Bangalore, Karnataka, India.)

Undergraduate Level Winner

“Prof. Araceli Medina Bonifant: A Rare Gem”

Rose Mathews, Stony Brook University (SUNY), Stony Brook, NY

(The essay was about Dr. Araceli Medina Bonifant of Stony Brook University.)

Undergraduate Level Honorable Mention

“An Inspirational Actuary”

Cheri Morris, Hampton University, Hampton, VA

(The essay was about Ms. Mischelle Schweickert of Kaiser Permanente.)

High School Level Winner

Same as Grand Prize Winner

High School Level Honorable Mentions

“The Origin of Math-Teacher: A Biography of Shari DeRossett”
Rebecca Frederick, Lakota West High School, West Chester, OH

(The essay was about Ms. Shari DeRossett of Lakota West High School.)

“Shelly Harvey: Knot Your Typical California Girl!”

Anita Rao, Dawson High School, Pearland, TX

(The essay was about Dr. Shelly Harvey of Rice University.)

Middle School Level Winner

“A Life in the Circle: Tatiana Shubin, PhD”

Lilith Sarkar, Castellero Middle School, San Jose, CA

(The essay was about Dr. Tatiana Shubin of San Jose State University.)

Middle School Level Honorable Mentions

“Ms. Sheila Krilov: A Teacher's Return”

Flavia Sinha, Hunter College High School., New York, NY

(The essay was about Ms. Sheila Krilov of Hunter College High School.)

“A Woman to Lead the Way”

Nary Touch, Southwest Early College Campus, Kansas City, MO

(The essay was about Dr. Swati DebRoy of University of Missouri-Kansas City.)

continued on page 6

Dr. Mythily Ramaswamy: Making a Difference, One Equation at a Time

Gitanjali Lakshminarayanan

The first thing that struck me was how ordinary she looked. You could walk by her on the street and not even realize that you just passed one of the leading research mathematicians in India. I was waiting in the library of the Tata Institute of Fundamental Research (TIFR), deep in the heart of Bangalore, one of India's most populated cities, when Dr. Mythily Ramaswamy walked in. We went to the cafeteria where we ate some of the best cafeteria food I have ever tasted. I interviewed her in her relatively small office which appeared to be only ten by ten feet, in which she had managed to fit two desks. Her white board was covered with equations like a cliché.

TIFR is one of India's top research institutions and has produced world-renowned scientists. Ramaswamy is the Dean of the Centre for Applicable Mathematics and does specialized research in partial differential equations. She explained to me how partial differential equations have a variety of applications such as weather predictions, engineering, aeronautics and even medicine; for instance, in calculating how much insulin to give a patient being treated for diabetes.

Born near Mumbai, Ramaswamy spent her childhood moving around India, wherever her father's job took him and the rest of his family. Despite the obvious challenges that moving so frequently would pose to a young girl, Ramaswamy insists that because she saw all of India as a child, she received a great education that equipped her to mix with a variety of people. It has helped her teaching career, as she says, "I am able to handle people better because of my exposure at a younger age to various cultures."

From her first acquaintance with the subject, math was the only path for her. No other subject came close. She liked the rigid boundaries and the precision: that "yes" or "no." She also enjoyed the ability to prove things and to seek out patterns in numbers. However, when I asked her what she remembers from her childhood, she said that she only remembers playing with her friends and climbing trees; she did not think of math as a career until later.

Ramaswamy did have a lot of support at home because her mother was a math lover herself. However, when she

decided to go into research, her parents were not happy; they wanted her to take a secure bank job as many in her family had done. However, she insisted on continuing with research. She had heard of the TIFR from her cousin, and during her college years, Ramaswamy was taught by some professors from TIFR. She was immensely fascinated by them and therefore attracted to a research career. When we talked about the declining interest in math amongst US school students, she simply said that if you really understand math, you enjoy it. "It is like playing a game. Once you enjoy it, there is no stopping you. You'll go all the way to the end."

Before Ramaswamy became a professor in TIFR, she encountered several challenges as a woman. Once, a professor predicted that a start-up center would not hire women because they would get married, have a child, and resign. Ironically, she stayed to complete the course while most of her male colleagues left. Today, people accept that women are here to stay. However, even now, she feels there are some disadvantages. For example, while many of her male colleagues are easily able to spend evenings and extra hours with a visiting professor, Ramaswamy is under various pressures to go back home. Travelling is also a problem; she can only choose one or two trips: "I have to work out an elaborate plan. Who will take care of the house; who will take care of the family?" she asked. She feels that men have more networking opportunities around the world so they are noticed more. She encourages more women to join mathematics by saying, "The only way anything will change is if there are more voices."

Ramaswamy has not just traveled around India; when TIFR was starting a school of Differential Equations in Bangalore, they sponsored her trip to France. She spent two and a half years there and did her thesis at l'Université Pierre et Marie Curie in Paris. Her trip to France enhanced her love of math since many famous mathematicians stop in Paris for the summer, and she was able to meet some of them; it was an inspiring experience. She also travels to the United States and Italy for meetings. Her favorite place is Italy because, "Italy, somehow, is very close to India in its approach to life and mathematics."

The part of Ramaswamy's job that she most enjoys is teaching. She loves to explain difficult concepts to students, and when they finally understand, it makes her happy. Her second favorite part is the research: looking for new equations, and how to formulate difficult questions mathematically. She is able to put them together by giving frequent workshops for undergraduate students in the hope that more girls will join math related fields.

When she is not thinking about math, Ramaswamy is very involved with South Indian classical music called “Karnataka” music. She used to play the veena, a stringed Indian instrument, but now she has no time although she still attends concerts. She also likes comedy and light-hearted movies, and detective movies because they are like a puzzle.

Through enormous perseverance and dedication, Mythily Ramaswamy has been able to achieve everything that she has today. During her stay in France she received the Diplôme de Troisième Cycle in 1983, a doctorate-level degree, and the Docteur de l’Université in 1990 for her thesis. She says that she has gotten so far in her career because she just loves what she does. I believe the mathematical community owes a debt to the bank she did not join.

About the Student:

I am a sophomore in the IB program at Vanguard High School in Florida. I am the founder and president of our school’s Mu Alpha Theta (a mathematics honor society) chapter. In addition to math, I enjoy science subjects and plan to study biomedical engineering. I love to travel to unusual places and have been to Peru, Turkey, Greece, Finland, and Russia. I frequently visit India where much of my family resides. I love origami; I attended the New York Origami Convention in 2010. I have been playing piano for ten years, do competitive swimming, and am a varsity runner on our cross country team.

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.**

2011 Newsletter Thank-yous

Thanks to all who contributed to the newsletter last year! Those who wrote articles or contributed in other ways are listed below.

American Mathematical Society	Irina Mitrea
Marge Bayer	Kelly Moran
Georgia Benkart	Mary Morley
Capi Corrales Rodriganez	Andrew Nestler
Jackie Dewar	Katharine Ott
Cindy Dyer	Teri Perl
Sarah J. Greenwald	Jill Pipher
Patricia Hale	Jennifer Quinn
Pao-sheng Hsu	Julie Rehmeyer
Matthew Hundley	Kristine Roinestad
Jacqueline Jensen-Vallin	Judy Roitman
Gilbert Kalish	Evelyn Sander
Alex Kasman	Alice Silverberg
Sandra Keith	Martha K. Smith
Pat Kenschaft	Christina Sormani
Cathy Kessel	Erica Voolich
Suzanne Lenhart	Ginger Warfield
Jennifer Lewis	Kay Weiss
Cammy Cole Manning	Stephanie Wenclawski
Maeve McCarthy	Aziz Yakubu
Martha McCaughey	Betsy Yanik

EDUCATION COLUMN

The High Cost of Quantitative Illiteracy

Mary E. Morley

In the United States people are often not shy about saying that they are not good at mathematics. Sometimes they even seem proud of the fact that they can't do arithmetic. Not all of these people are really quantitatively illiterate, but too many of them are. And being quantitatively illiterate is a serious matter. It can affect careers, financial well being, health, and even our children's health. The purpose of this column is to share the results of several recent studies that suggest just how serious the consequences of quantitative illiteracy can be.

The first study is published in a paper entitled "Financial Literacy and Subprime Mortgage Delinquency: Evidence from a Survey Matched to Administrative Data." This study was done by Kristopher Gerardi, Lorenz Goette, and Stephen Meier. The title talks about financial literacy, but the aspect of financial literacy the authors are most concerned with is what they call "numerical ability." I put this in quotes because I think what they are describing might be better called numerical skills, since they are talking about material that is taught in

CALL FOR NOMINATIONS

The 2014 Noether Lecture

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

The mathematicians who have given the Noether lectures in the past are: Jessie MacWilliams, Olga Taussky Todd, Julia Robinson, Cathleen Morawetz, Mary Ellen Rudin, Jane Cronin Scanlon, Yvonne Choquet-Bruhat, Joan Birman, Karen Uhlenbeck, Mary Wheeler, Bhama Srinivasan, Alexandra Bellow, Nancy Rothschild, Dusa McDuff, Krystyna Kuperberg, Margaret Wright, Sun-Yung Alice Chang, Lenore Blum, Jean Taylor, Svetlana Katok, Lai-Sang Young, Ingrid Daubechies, Karen Vogtmann, Audrey Terras, Fan Chung Graham, Carolyn Gordon, Susan Montgomery and Barbara Keyfitz.

The letter of nomination should include a one-page outline of the nominee's contribution to mathematics, giving four of her most important papers and other relevant information. Nominations are to be submitted as ONE PDF file via MathPrograms.Org. The submission link will be available 45 days prior to the deadline. Nominations must be submitted by **October 15, 2012** and will be held active for three years. If you have questions, phone 703-934-0163 or email awm@awm-math.org.

grade school. The authors of the study were interested in the causes of the mortgage crises, and whether the numerical ability of the borrowers played a part in the crises. According to the authors, people with less numerical skill are less likely to save, to plan for retirement, or to understand credit. They found “a large and statistically significant negative correlation between numerical ability and various measures of delinquency and default.” Even after socio-demographic characteristics were taken into account, people with poor math skills were found more likely to default or be delinquent on mortgages. Based on their findings, the authors suggested an arithmetic test for mortgage applicants. The authors even go so far as to suggest that poor numerical ability of borrowers could have helped cause the subprime mortgage crisis. They say that in their view it must have at least exacerbated a bad situation: “[w]hile we cannot rule out all other possible explanations, the robustness of our empirical estimates leads us to conclude that limited numerical ability played a non-trivial role in the subprime mortgage crisis.”

The numerical skills referred to above are very elementary. Here are two of the questions used in the study to determine the numerical skills of the participants.

In a sale, a shop is selling all items at half price. Before the sale, a sofa costs \$300. How much will it cost in the sale?

Let's say you have \$200 in a savings account. The account earns ten percent interest per year. How much will you have in the account at the end of two years?

Participants in the study were placed into one of four different levels of numerical ability based on their answers to these and other questions. The second question above was considered so difficult that only people in the highest level of numerical ability were expected to answer it correctly. Given the grade school nature of the questions, it is troubling how poorly the participants performed. Only 13.3% of the participants fell into the highest group, and 15.6% fell into the lowest group. Unfortunately, schooling by itself doesn't seem to solve the problem of quantitative illiteracy; the group of participants that were placed in the lowest numerical group was surprisingly well educated. Slightly over half of the people in the lowest numerical group had at least attended college, and 6% of the lowest group had a graduate degree. The paper detailing this study is available on the web; it makes for some interesting reading: http://www.995hope.org/wp-content/uploads/2011/07/Federal_

[Reserve_Bank_of_Atlanta.pdf](#).

Other consequences of quantitative illiteracy can be even worse than defaulting on a mortgage. The two studies I will refer to on this topic are both medical studies. The first was presented to the American Academy of Pediatrics this year in Boston, and it investigated the reasons behind cases of children receiving incorrect doses of medicine. As in the other study, participants (in this case parents) were classified based on their math skills. This study found that parents in the lowest arithmetic category were five times more likely to give incorrect doses than parents in the highest arithmetic category. Here the lowest numerical category was defined as having 3rd grade or below math skills. The highest category was defined as having 6th grade skills or above. As in the other study, it is troubling how many participants fell into the lowest category. Twenty-seven percent of the parents in the study were found to have math skills at the level third grade or below. Altogether 83% of the parents were found to have

continued on page 10

Ruth I. Michler Prize

The Association for Women in Mathematics invites applications for the seventh annual Ruth I. Michler Memorial Prize.

A \$47,000 prize will be awarded to a woman, recently promoted to associate professor or the equivalent, for a semester of mathematical research without teaching obligations in the Mathematics Department of Cornell University.

A supplemental housing/subsistence stipend award of \$3,000 will be provided. Office space, library access, and computing facilities will be provided by Cornell.

The application deadline is November 1 for the award to be used during the 2013–14 academic year.



www.awm-math.org/michlerprize.html



Cornell University



poor math skills. A summary of this study may be found on the National Institutes of Health website at http://www.nlm.nih.gov/medlineplus/news/fullstory_124635.html.

Another study was concerned with diabetic patients. This study found that poor math skills might worsen diabetes control. It also suggests that helping patients with their numeracy might help reduce diabetes complications. Such complications, from incorrect dosage of diabetes medication, may include coma and death. There is also a risk of seizures and permanent damage to the nervous system from severe hypoglycemia. A summary of this study may be found at <http://forecast.diabetes.org/news/poor-math-skills-may-worsen-diabetes-control>.

Quantitative illiteracy is a problem that can have serious consequences. And as we have seen, the number of adults that suffer from it is very troubling. It is not just drop-outs that are quantitatively illiterate; some of the lowest scorers in these studies were college graduates. Nor is it just people who left school decades ago that have trouble with basic concepts, such as percentages. For example, the following question was part of a National Assessment of Educational Progress test taken by 17 year-olds in 2008.¹

¹ Block 21, Question 16. http://nces.ed.gov/nationsreportcard/itmrlsx/search.aspx?subject=long-term_trend_mathematics

Which of the following is true about 56% of 20?

A. It is less than 20.

B. It is greater than 20.

C. It is equal to 20.

D. It is more than double 20.

This is a very basic question that deals with the meaning of percentages. While most students did answer this question correctly, twenty-six percent of 17 year olds did not. If students do not understand percentages while they are still in school, they are unlikely to understand them later. Someone who does not know that 56% of 20 is less than 20 is not likely to understand a terms-and-conditions statement for a credit card, or even to read the small print in a mortgage agreement. It is difficult to function in modern society without a good understanding of credit and it is impossible to understand credit unless you are numerically literate.

So what can be done about quantitative illiteracy? We as a society need to start taking it seriously. Being illiterate with respect to numbers is as serious a problem as being illiterate with respect to words. The difference is that nobody is proud of being unable to read.

CALL FOR NOMINATIONS

Alice T. Schafer Mathematics Prize

The Executive Committee of the Association for Women in Mathematics calls for nominations for the Alice T. Schafer Mathematics Prize to be awarded to an undergraduate woman for excellence in mathematics. All members of the mathematical community are invited to submit nominations for the Prize. The nominee may be at any level in her undergraduate career, but must be an undergraduate as of October 1, 2012. She must either be a US citizen or have a school address in the US. The Prize will be awarded at the Joint Prize Session at the Joint Mathematics Meetings in San Diego, January 2013.

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

With letter of nomination, please include a copy of transcripts and indicate undergraduate level. Any additional supporting materials (e.g., reports from summer work using math, copies of talks, recommendation letters from professors, colleagues, etc.) should be enclosed with the nomination. All nomination materials to be submitted as ONE PDF file via MathPrograms with a copy of transcripts included at the end of the file. The submission link will be available 45 days prior to the deadline. Nominations must be received by **October 1, 2012**. If you have questions, phone 703-934-0163, email awm@awm-math.org, or visit www.awm-math.org.

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

Women Mathematicians on the Web, Part II: Finding the First

Margaret A.M. Murray, Margaret-a-murray@uiowa.edu

The first installment of this series appeared in the May–June 2012 issue of this newsletter.

I opened this series with a simple question: For any given university in the United States, who was the first woman to earn a PhD in mathematics there, and when did she earn it? As an illustration, I considered the case of Yale, and the fact that reputable websites—including a site devoted to the speeches of Yale President Richard Levin ([1])—replicate the assertion that Grace Murray Hopper’s 1934 PhD in mathematics was the first such degree Yale awarded to a woman.

In fact, the first woman awarded a Yale PhD in mathematics enrolled at Yale in 1892—the first year that Yale graduate degree programs were opened to women—and earned the degree by 1895. In their 2008 book *Pioneering Women in American Mathematics: The Pre-1940 PhDs*, Judy Green and Jeanne LaDuke identify that woman as Charlotte Barnum (1860–1934). Coincidentally, Barnum and Hopper both graduated from Vassar College, Barnum in 1881, Hopper in 1928. And, in a still more striking coincidence, Barnum died and was buried in the Grove Street Cemetery—adjacent to Yale—just two months before Hopper received her degree ([2]).

In my first installment, I expended considerable effort tracking down the origins of “the Hopper error” and its subsequent propagation across the Internet. In particular, I wondered whether historian Kurt Beyer—in his great admiration for Hopper—had read the historical record a bit selectively ([3]).

What I did not admit, however, is that I, too, have helped to propagate a similar error.

In 1993—inspired by the early work of Green and LaDuke on the 228 pre-1940 PhDs—I began my own study of the roughly 200 women who’d earned PhDs in mathematics from US institutions in the 1940s and 1950s. Even without benefit of the Internet, it was still fairly easy to compile a fairly complete list of their names, doctoral institutions, and dissertation titles, along with some skeletal biographies. While I wanted to create a complete database, as Green and LaDuke were doing, my short-term goal was to conduct interviews with a representative sample of the women. The result—based on 36 interviews—was my book, *Women Becoming Mathematicians* ([4]).

In the 1990s, conventional wisdom in the mathematical community held that the first two Black women to earn math PhDs were Evelyn Granville (1924–), who received the degree at Yale in 1949, and Marjorie Lee Browne (1914–1979), who received hers at Michigan in 1950. In a remarkable 1981 paper, mathematician Patricia Clark Kenschaft had identified them as the first and only two Black women to earn math PhDs prior to 1960 ([5]). In *Women Becoming Mathematicians*—which features an interview with Granville—I pass on this conventional wisdom, with credit to Kenschaft and kudos to Yale.

But in the summer of 2001, just as my book came out in paperback, I learned that the conventional wisdom was wrong. The news came in an e-mail from Scott Williams, an African-American mathematician at the University of Buffalo. Since 1997, Williams has maintained his own award-winning website, *Mathematicians of the African Diaspora* (<http://www.math.buffalo.edu/mad/index.html>), a biographical database of Black mathematicians. Like me, Williams had believed the common wisdom, until he’d heard differently from Robert Fikes, Jr., historian and reference librarian at San Diego State University. According to Fikes, the first Black woman PhD in mathematics was Euphemia Lofton Haynes (1890–1980), who’d earned the degree at the Catholic University of America in 1943 ([6]).

Euphemia Lofton Haynes! I knew the name immediately. She was in my database; I knew the date of her birth, the title of her dissertation, the name of her adviser, the fact of her death. Had I taken the time to track down the date and place of her death—even in the late 1990s, the Social Security Death Index (SSDI) was easily accessible online—I would have discovered that she’d died in Washington, D.C. From

continued on page 12

there, as I'd done for several other women in my database, I would have scrolled through microfilms of the *Washington Post* until I found her obituary, and her photo ([7]). So why, oh why, had I not done this myself?

The answer is simple. Just as Kurt Beyer had chosen to believe the Navy folklore about Grace Hopper, I'd chosen to believe some folklore of my own: I'd assumed that Euphemia Lofton Haynes must have been a white Roman Catholic nun.

Prior to 1950, Catholic University was one of the leading grantors of mathematics PhDs to women, most of them Roman Catholic sisters teaching at Catholic women's

high schools and colleges. "The key figure in mathematics at Catholic," write Green and LaDuke, "was Aubrey Landry, who directed the mathematics dissertations of all the women religious there until the early 1940s." Euphemia Lofton Haynes worked with Landry, too; I reasoned—incorrectly—that since Landry supervised all the nuns, every woman he supervised was a nun ([8]). During my Catholic girlhood in 1960s Chicago, all of the nuns—and all of the Catholics!—I'd known had been white. For reasons that were not entirely conscious, I was sure that "Sister Euphemia" must have been white, too.

I already knew *for certain* that at least 27 of the women in my database who had earned PhDs in mathematics during

AWM WORKSHOP FOR WOMEN GRADUATE STUDENTS AND RECENT PhDs AT THE 2013 JOINT MATHEMATICS MEETINGS

Application Deadline: **August 15, 2012**

For many years, the Association for Women in Mathematics has held a series of workshops for women graduate students and recent PhDs in conjunction with major mathematics meetings. We have received support from the National Security Agency for the AWM Workshop to be held in conjunction with the Joint Mathematics Meetings in San Diego in January 2013.

FORMAT: Starting in 2013 the research area for the talks will be focused, and the research theme will change from year to year. Poster presenters will be chosen from all fields of mathematics. The AWM Workshop talks in San Diego in 2013 will focus on number theory. Participants will be selected in advance of the workshop to present their work. Recent PhDs will join senior women in a special session on number theory where they will give 20-minute talks. The graduate students will present posters. AWM will offer partial funding for travel and hotel accommodations for the selected participants. The workshop will also include a reception. Workshop participants will have the opportunity to meet with other women mathematicians at all stages of their careers.

All mathematicians (female and male) are invited to attend the talks and posters. Departments are urged to help graduate students and recent PhDs who are not selected for the workshop to obtain institutional support to attend the presentations.

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

ELIGIBILITY: To be eligible for selection and funding, a graduate student must have made substantial progress towards her thesis and a recent PhD must have received her PhD within approximately the last five years, whether or not she currently holds a postdoctoral or other academic position. Women with grants or other sources of support are welcome to apply. All non-US citizens must have a current US address.

All applications should include:

- a title of the proposed poster or talk
- an abstract in the form required for AMS Special Session submissions for the Joint Mathematics Meetings
- a curriculum vitae
- one letter of recommendation from a faculty member or research mathematician who knows the applicant's work—in particular, a graduate student should include a letter of recommendation from her thesis advisor.

Applications (including abstract submission via the Joint Mathematics Meetings website) must be completed electronically by **August 15, 2012**. See <http://www.awm-math.org/workshops.html> for details.

the 1940s and 1950s were nuns. Of the very few nuns still living, I was intent on trying to find at least one to interview. So I stopped collecting information on the nuns no longer living. And I stopped gathering information about Euphemia Lofton Haynes.

* * *

Like Beyer, perhaps, I'd succumbed to the power of *confirmation bias*: the tendency to see precisely that information that confirms one's preconceptions. It's much easier to diagnose in others than it is to see in oneself. I'd assumed that the first university to award a mathematics PhD to an African-American had been a secular university. That this secular university had been my own doctoral alma mater, Yale, fit rather neatly with my own academic narrative: for I myself had escaped the confines of my Catholic upbringing and gone on to graduate from two secular universities, Chicago and Yale.

As with Barnum and Hopper, the lives of Haynes and Granville contain several uncanny parallels. Both women grew up in the African-American community of Washington, D.C. Euphemia Lofton graduated from M Street High School (as valedictorian, in 1907) and Miner Normal School (in 1909)—the academic high school and teacher's college, respectively, for Black students in Washington. She subsequently earned a BA from Smith College, began her teaching career, and married fellow M Street graduate and educator Harold Haynes. While working full-time, she earned a Master's degree in Education—at the University of Chicago!—in 1930, followed by the PhD from Catholic 13 years later. She founded the mathematics department at Miner Normal School and spent nearly three decades as its head.

In 1916, the M Street School became the Paul Lawrence Dunbar High School. Evelyn Granville's mother graduated from Dunbar; Granville's aunt, a teacher and a role model for Granville, graduated from both Dunbar and from Miner Normal School. Granville herself graduated from Dunbar, as one of five valedictorians, in 1941. From there Granville went on to Smith—like Euphemia Lofton before her—and thence to Yale ([9]).

Euphemia Haynes, though not a nun, was indeed a devout Catholic, and spent most of her life in Washington, DC, devoting herself to the education of African Americans, and working in retirement for the desegregation of the public schools in DC. As a product of a later generation, Granville criss-crossed the country, moving from academia to government to industry and back to academia again; she

followed opportunities as they opened to both Blacks and women, maintaining her ties to the mathematical community as she traveled. So when mathematicians went looking for their first Black woman PhD, it's no wonder they found Granville and missed Haynes altogether.

But Haynes and Granville—like Barnum and Hopper—emerged from a common community. It's hard to imagine that their paths never crossed.

* * *

In general, how does one go about answering questions of the sort, *Who was the first person of type X to accomplish Y*? Cathy Kessel has helpfully pointed out to me that answering this type of question requires that you know everyone who has accomplished *Y*, together with the date when they accomplished it, up to and including the first instance of someone of type *X*. In particular, you need a clear definition of both *X* and *Y* ([10]). Sounds simple, doesn't it?

But it's much more difficult in practice. Let's consider the case where *a person of type X* is, simply, a woman, and *to accomplish Y* means to earn a PhD in mathematics from Yale. How did Green and LaDuke answer this question? To begin, they needed to clearly define what they meant by *PhD in mathematics*, a concept which, on its face, should be easy to define. But in the early years of graduate education at Yale, there was no mathematics department *per se*, so determining whether a given PhD was actually awarded *in mathematics* depends heavily on the subject matter of the dissertation ([11]). If that subject matter is statistics, physics, history of mathematics, or mathematics education, then—with a few, carefully worded exceptions—Green and LaDuke do not consider the degree to be a PhD in mathematics ([12]).

Armed with their definition of *Y*, Green and LaDuke traveled to Yale and examined primary sources, including actual dissertations, course schedules, and transcripts. On this basis, they identified Charlotte Barnum as the first woman awarded a PhD in mathematics at Yale.

But at least one person has examined the very same documents and come to an entirely different conclusion. That person was Ernest W. Brown (1866–1938), who came to Yale as Professor of Mathematics in 1907. In an official Yale University document published in 1920, Brown identifies Yale's first female mathematics PhD as Margaretta Palmer (1862–1924) who—like Barnum—enrolled at Yale in 1892, but—unlike Barnum—earned the PhD in 1894 ([13]). What accounts for the discrepancy?

continued on page 14

In a recent conversation, Jeanne LaDuke assured me that she and Judy Green have long been aware of Margareta Palmer; they excluded her from their study because the subject matter of her dissertation—*Determination of the Orbit of the Comet 1847 VI* ([14])—was best classified as astronomy rather than mathematics. But here's the rub: despite the fact that Ernest W. Brown was active in the American Mathematical Society, serving as Vice-President in 1907 and President in 1915–16, the vast majority of his scholarly work would nowadays be considered astronomy, and he, too, would probably not be considered a mathematician! Complicating matters further, both Palmer and Barnum worked as “computers” performing astronomical computations at the Yale Observatory. But Palmer's was the more distinguished career: she worked for the Yale Observatory for thirty-five years, and Brown was almost certainly well-acquainted with her both personally and professionally.

So, perhaps because academic disciplines are far more fragmented now than they were at the turn of the 20th century, Charlotte Barnum wins the prize on a technicality. But given that few historians of mathematics would care to deny Ernest W. Brown his status as a mathematician, perhaps Margareta Palmer deserves at least an asterisk in the official record.

What this extended discussion should make clear most of all is that, in answering historical questions of the sort we have been considering, *definitions matter*. In my next installment, I'll take up a question that has a bearing on all the historical controversies I've been discussing: when we try to construct a history of women in mathematics, what counts as evidence? And how can we use these standards of evidence to evaluate the history of women in mathematics as it is presented on the web?

Notes

1. In recent months, the web address for President Levin's 2009 Freshman Address has changed to <http://communications.yale.edu/president/speeches/2009/08/28/freshman-address> (accessed May 13, 2012). The date for the speech—formerly listed as August 29, 2012—has been changed, but the Hopper error has not been corrected.
2. Judy Green and Jeanne LaDuke, *Pioneering Women in American Mathematics: The Pre-1940 PhDs* (Providence: American Mathematical Society, 2008), with additional material online at <http://www.ams.org/publications/>

[authors/books/postpub/hmath-34](http://www.ams.org/publications/hmath-34).

3. Kurt Beyer, *Grace Hopper and the Invention of the Information Age* (Cambridge: MIT Press, 2009). The book is based on Beyer's 2002 Berkeley history doctoral dissertation, *Grace Hopper and the Early History of Computer Programming, 1944–1960*, available via ProQuest Dissertations and Theses.
4. Margaret A.M. Murray, *Women Becoming Mathematicians: Creating a Professional Identity in Post-World War II America* (Cambridge: MIT Press, 2000).
5. Patricia Clark Kenschaft, “Black Women in Mathematics in the United States,” *American Mathematical Monthly* 88 (1981): 592–604.
6. Scott W. Williams, *Euphemia Lofton Haynes, First African American Woman Mathematician*, <http://www.math.buffalo.edu/mad/PEEPS/haynes.euphemia.lofton.html>. On Haynes, see “Biographical Note,” in the online *Inventory of the Haynes-Lofton Family Papers, Catholic University of America Archives*, <http://archives.lib.cua.edu/findingaid/Haynes-Lofton.cfm>.
7. The SSDI is a standard tool of genealogical and historical research, accessible, for example, via the Church of Jesus Christ of Latter-Day Saints site <https://www.familysearch.org>. The Haynes obituary is Maureen Joyce, “Schools Figure Euphemia Haynes Dies,” *Washington Post*, August 1, 1980, B4, with accompanying photograph by Ken Feil.
8. On Landry, see Green and LaDuke, 52. I first learned that Aubrey Landry was Haynes' advisor via personal correspondence from Catholic University librarian Karen P. Hoffman dated August 31, 1995.
9. On the M Street School and Dunbar High School, see Mary Gibson Hundley, *The Dunbar Story, 1870–1955* (New York: Vantage 1965); and Henry S. Robinson, “The M Street High School, 1891–1916,” *Records of the Columbia Historical Society, Washington, DC* 51 (1984): 119–143. Information on Granville is derived from my May 1997 interview with her, and from Evelyn Boyd Granville, “My Life as a Mathematician,” in *SAGE: A Scholarly Journal on Black Women* 6 (1989) 2: 44–46, reproduced online at Biographies of Women Mathematicians, Agnes Scott College, <http://www.agnesscott.edu/lriddle/women/granvill.htm>.
10. I've been blurring the distinction between *earning* a degree and *receiving* it. This would be problematic in the case of, say, Johns Hopkins University, where Christine Ladd-Franklin was the first woman to *earn*

a mathematics PhD (1882; received 1926), but Clara Bacon was the first woman to *receive* one (1911). For details, see Green and LaDuke, *Pioneering Women*.

11. On this subject, see Harold L. Dorwart, "Mathematics and Yale in the Nineteen Twenties," in Peter L. Duren, Richard A. Askey, and Uta C. Merzbach (eds.), *A Century of Mathematics in America, Part II* (Providence: American Mathematical Society, 1989).
12. Green and LaDuke, Chapter 1.
13. See Ernest William Brown, "Mathematics," in Margaret Trumbull Corwin, *Alumnae, Graduate School, Yale University, 1894–1920* (New Haven: Yale University, 1920), pp. 52–55; available via Google Books at <http://books.google.com/books?id=wxBAAAAIAAJ>. See also Yale

University Graduate School, *Doctors of Philosophy of Yale University, with the Titles of Their Dissertations 1861–1915* (New Haven: Yale University, 1916), pp. 65–76; available via Google Books at <http://books.google.com/books?id=x3IKAAAIAAJ>. For a biography of Brown, see Frank Schlesinger and Dirk Brouwer, "Ernest William Brown, 1866–1938," *Biographical Memoirs of the National Academy of Sciences* 6 (1939), available for download at <http://www.nasonline.org/publications/biographical-memoirs/online-collection.html>.

14. Published in *Transactions of the Astronomical Observatory of Yale University* 1 (1893): 183–207, available for download through the Smithsonian Astrophysical Observatory at <http://adsabs.harvard.edu/full/1887TOYal...1..183P>.

AWM WORKSHOP FOR WOMEN GRADUATE STUDENTS AND RECENT PhDs AT SIAM

supported by the Department of Energy and the Association for Women in Mathematics

For many years, the Association for Women in Mathematics has held a series of workshops for women graduate students and recent PhDs in conjunction with major mathematics meetings.

WHEN: An AWM Workshop is scheduled to be held in conjunction with the SIAM Annual Meeting, San Diego, CA, July 8–12, 2013.

FORMAT: The workshop will consist of a poster session by graduate students and two minisymposia featuring selected recent PhDs, plus an informational minisymposium directed at starting a career. The graduate student poster sessions will include all areas of research, but each research minisymposium will have a definite focus selected from the areas of Mathematical Biology, Modeling, Control, Optimization, Scientific Computing, and PDEs and Applications. AWM will offer partial funding for travel expenses for between fifteen and twenty participants. Departments are urged to help graduate students and recent PhDs obtain supplementary institutional support to attend the workshop presentations and the associated meetings. All mathematicians (female and male) are invited to attend the program.

MENTORS: We also seek volunteers to act as mentors for workshop participants. If you are interested in volunteering, please contact the AWM office.

ELIGIBILITY: To be eligible for selection and funding, a graduate student must have begun work on her thesis problem, and a recent PhD must have received her degree within approximately the last five years, whether or not she currently holds a postdoctoral or other academic or non-academic position. All non-US citizens must have a current US address. All selected and funded participants are invited and strongly encouraged to attend the full AWM two-day program. For some advice on the application process from some of the conference organizers see the AWM website.

All applications should include:

- a cover letter
- a title and a brief abstract (75 words or less) of the proposed poster or talk
- a concise description of research (one or two pages)
- a curriculum vitae
- at least one letter of recommendation from a faculty member or research mathematician who knows the applicant's work is required for graduate students and recommended but not required for recent PhDs. In particular, a graduate student should include a letter of recommendation from her thesis advisor.

Applications must be completed electronically by **November 1, 2012**. See <http://www.awm-math.org/workshops.html>.

BOOK REVIEW

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

Professor Mommy: Finding Work-Family Balance in Academia, Rachel Connelly and Kristen Ghodsee, Rowman and Littlefield Publishers Inc., 2011.

Reviewers: Della Dumbaugh, ddumbaugh@richmond.edu, and Hannah Fenster, hafen001@mail.goucher.edu

In the pregnancy world, *What to Expect When You're Expecting* is on every woman's bookshelf. For academics and prospective academics, *Professor Mommy* needs to stand right alongside it. In less than 200 pages, Rachel Connelly and Kristen Ghodsee describe the process from graduate school to full professor for an academic woman with children, an academic woman who hopes to have children or an academic woman who has yet to decide whether or not to have children. Even more, their recommendations for how to manage an early academic career and put together a successful tenure dossier (pp. 142–148) are among the best in the business. Any academic will benefit from their helpful insights.

This book is long overdue. Since women have entered the faculty ranks of “The Academy,” they have negotiated the tricky intersection of a biological time clock with a tenure clock. As the authors put it, “at the exact moment when you are trying to impress the academic world with your original contributions to the collected knowledge of the human race, you are standing over a bassinet trying to reinvent the wheel when it comes to effectively dealing with a nasty case of diaper rash” (p. 32). This book brings an informed consideration of that confluence of seemingly disparate events. Connelly and Ghodsee draw from their individual and collective experiences as Professor Mommies, interviews with other members of the academic community, and relevant research. The 2008 anthology *Mama, PhD* addressed some of these issues but focused more on careers outside of academia, a point the authors hope to redress in *Professor Mommy*.

Connelly and Ghodsee begin the book with nine myths about motherhood and academia. Some of these myths are important for every parent to know, such as “Myth #7: Child Care Is Always Lower Quality Than Mother Care.” Pointing out that “external” care can contribute positively to the development of a child situates the issues facing a

Professor Mommy—and any mother for that matter—in the broader context of American society. Connelly and Ghodsee take on less comfortable myths of “getting and being pregnant will be easy,” and “there is no longer sexism in the academy,” not exactly your typical post-colloquium discussion. Their candid advice for counteracting sexism is timeless: “Most of all, work hard and prove them wrong” (p. 30).

Once the authors establish this more realistic frame for motherhood and academia, they urge the reader to “Know Thyself.” But they do not leave the reader alone in this introspective process. Instead, they pose challenging questions to guide the reader through this tricky journey. The most critical questions include: Do you want to be an academic? If so, do you want to have a child? If you want to have a child, when? Connelly and Ghodsee's discussion of this last question is essential to the success of their book. The authors make use of individual experiences to articulate the pros/cons of having a child at various stages in an academic career. In keeping with the open and honest style of the book, Connelly and Ghodsee consider infertility and health insurance right alongside traditional academic issues such as completing the PhD and making the run for tenure. After weighing the evidence, Connelly and Ghodsee offer a single word conclusion to the best time to have a child: “Whenever” (p. 74). These reviewers could not help but laugh at the authors' assertion that “having kids is not something to get out of the way” (p. 75). It sounds like an echo of how some students view general education requirements. In this section, and elsewhere for that matter, *Professor Mommy* underscores the critical role of “senior mentors.” Some academics went so far as to suggest that the *absence* of a mentor proved detrimental to their success (p. 73).

Intentional or not, Connelly and Ghodsee present the second half of the book as something of an instruction manual. They start at the beginning: how to land a job at the type of institution that fits your skill set and personal aspirations. Here, Connelly and Ghodsee boldly—and rightfully—suggest that a Research Institution (“R1” in layman's terms) is not necessarily the be all and end all for every academic. They briefly introduce the reader to the large variety of academic institutions in this country. In their discussion of Baccalaureate Colleges, for example, Connelly and Ghodsee explain that at this type of institution “you are primarily teaching undergraduate students, and you are expected to be available to them in a much more intensive way than at any of the larger universities” (p. 97). For some academics, this “intense contact with undergraduate students

can be a source of pleasure” but “it can also be draining and time consuming” (p. 99). This type of information provides prospective academics—on the mommy track or not—with a more realistic view of job opportunities. It all comes back to the authors’ earlier point: Know Thyself. Knowing thyself includes knowing the options, one of the great strengths of *Professor Mommy*.

Here and elsewhere, Professor Mommy considers the differences in perceptions of male and female faculty. The authors articulate the impact these distinctions can have on a Professor Mommy:

Young female faculty, precisely those who are most likely to have young children in the home, are more likely to get asked to lunch by eager undergraduate students than senior male faculty. Students expect more nurturing and attention from young women than they do from young men. This can also cause unevenness in teaching evaluations: “he really knows his topic” for a standoffish male professor is transformed into “she is inaccessible” for a female professor. These differences in student perception happen everywhere, but at liberal arts colleges the student opinion forms matter more for promotion

and tenure, and students’ claims on their teachers’ time are greater (p. 99).

As discouraging and/or unfair as the situation might be, it is nonetheless useful to know what to expect in the classroom at this type of institution before you sign on the dotted line.

Not surprisingly, Connelly and Ghodsee give careful attention to the tenure process. They divide this discussion into the categories of Research, Networking, Teaching and Service. This section is invaluable to *all* academic colleagues, not just those pursuing a career with a child or with the hopes of having a child. The authors establish research as a foundation for the tenure process. Again, Connelly and Ghodsee willingly take up potentially delicate issues, this time in the form of co-authorship, making time for research in your day, finding the best publication venues for your work, dealing with rejection, and engaging in “shameless self promotion” since “who you know is just as important as what you know” (p. 126). Their insight is not only critical in these larger areas but in the smaller moments where research inevitably takes place. For example the authors caution against accepting seemingly small service obligations which, when

continued on page 18

CALL FOR NOMINATIONS

The 2013 Kovalevsky Lecture

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

The mathematicians who have given the prize lecture in the past are: Linda R. Petzold, Joyce R. McLaughlin, Ingrid Daubechies, Irene Fonseca, Lai-Sang Young, Dianne P. O’Leary, Andrea Bertozzi, Suzanne Lenhart, and Susanne Brenner. Barbara Keyfitz will deliver the 2012 lecture.

The lectureship may be awarded to anyone in the scientific or engineering community whose work highlights the achievements of women in applied or computational mathematics. The nomination must be accompanied by a written justification and a citation of about 100 words that may be read when introducing the speaker. Nominations are to be submitted as ONE PDF file via MathPrograms.Org. The submission link will be available 45 days prior to the deadline. Nominations must be received by **November 1, 2012** and will be kept active for two years.

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

combined with other seemingly small service obligations, add up to significant time commitments away from your research (p. 120). They also highlight what may seem like a positive opportunity, when your university “invites” you to teach in one of its new programs or initiatives, for instance, only to discover that this “invitation” will have a detrimental impact on your research. Bottom line: guard your research time. You need it. You need research to obtain tenure at most institutions. And research is your portable wealth if you want to change institutions (p. 112).

It is critical that readers stay the course through the chapter on “Coming up for Full Professor.” The authors’ retelling of Connelly’s promotion is particularly powerful. Connelly wanted to wait until one of her colleagues recognized her contributions and asked her to come up for full professor. “Forget it,” the authors advise. Instead, one of her academic friends convinced her it was the right thing to do for “womanhood” (p. 173). Indeed.

So who should read this book? You. The reviewers are a Professor Mommy of Mathematics at the University of Richmond and a Professor Mommy’s daughter in the form of a rising sophomore at Goucher College. The former would have benefitted from a book of this type when she was in graduate school. She plans to put the book in the hands of aspiring graduate students. The latter has already recommended the book to a rising junior who is unsure about her major and subsequent career path. More generally, the authors’ ability to strike a careful balance between a challenging and rewarding reality compel her to alert her classmates to the complexities of a career combining motherhood and academics.

Though Connelly and Ghodsee (rightly) assert that there is little time for self-care while en route to becoming Professor Mommy, allow yourself to indulge in this book. It will help guide you to a favorable position in the academic community and reassure you that others are alongside you on the journey.

Book Note: The second edition of *Sophie’s Diary: A Mathematical Novel* by Dora Musielak is available in the Spectrum Series published by the MAA. The first edition (self-published) was reviewed favorably in this newsletter in the September–October 2005 issue (available at <http://www.drivehq.com/jfolder-jp8755087/1748813252.aspx>). The reviewer noted the lack of an index; this has been remedied in the second edition.

Dedicated to Estelle: Teachers Do Make a Difference!

Alan Sultan, Queens College

I knew I would be writing this one day, and I always wondered how I would begin. An email from her daughter, Joanne, said that because of heavy flooding in the area, her mother, Estelle Gurin, had to evacuate her apartment, where she had been living independently into her early 90s. Estelle then moved into assisted living; she took with her just a few things that meant something to her. Among them: a math book, written by me many years ago, that was dedicated to her. Reading those words brought tears to my eyes, and I reflected upon the 50 year relationship that would soon end—a relationship between a math teacher who cared and took the extra step, and an aimless student whose life was changed in a most profound way.

I was 12 when I entered Mrs. Gurin’s class, and life at home was very twisted. Both of my parents were caught up in their own stuff and had essentially abandoned their children. The lack of direction and nurturing at home, the absence of a father and a virtually non-present mother, together with the beginning of puberty, sent me into a tizzy. Life seemed like a war zone. Each morning I would awaken to the battles I would inevitably fight during the day. I was angry and rebellious and could not relate to authority. I didn’t see the point of school. In fact, I saw the point of nothing.

Mrs. Gurin was full of life. She just seemed so excited about what she was doing. I couldn’t relate. I would come into class bored and anxious, smirking at this woman and wondering, “What gives with this woman? Why so enthusiastic?” On some level though, she was working on me. “If she is so excited about this stuff,” I thought, “there must be something to it.” Still, I worked little, cared less, and she gave me the failing grade I deserved. And that tough love taught me one of the most valuable lessons in life—that there are consequences to my actions, and that I must take responsibility for what happens to me. That was a turning point in my life. I didn’t want to be a failure. But I didn’t believe in myself. I felt I couldn’t do anything.

Each week she would put a “problem of the week” up on the side board for students in her classes to try. I never attempted one before, but one day I moseyed on up to the board and saw the following question: Augustus DeMorgan [1806–1871] was x years old in the year x^2 , find x . Having no



Estelle Gurin

background in algebra, and not knowing what x was, I had to reason out the answer, and I gave her my solution. What I got back was a paper with "[[extra credit +1] ²] ²]" written on it. Looking back, it seems silly. The question was an easy one. But for someone who was starved for recognition, her caring and attention meant the world to me.

After that, she tried to encourage me to try harder. She gave me some books to read. One of them was *Flatland* and another was *How to Compute Quickly*. And I read them. On my own, I bought an algebra book (an Amsco review book). I wanted to find out what that elusive x meant in the DeMorgan problem. I was determined to read the book and learn the material. I asked another teacher if he would answer any questions I might have about algebra and he said yes. (I didn't dare let Estelle know that I was doing this. If she saw that I had to read an algebra book to learn algebra, her high opinion of me might change. And this I didn't want.)

I learned algebra quickly and continued to read. By the end of the next year, I had advanced quite a bit and earned the math award the school gave out. My career as a mathematician had started. I was no longer in Estelle's class, but her influence was with me daily. I worked hard to get better at what I was doing, and by the end of high school, I was seen as a rather strong math student. I entered college on a full scholarship (the first person in my family to get past high school) and went even though I met a lot of family resistance. "You won't be going to college. You will work like

the rest of us. No bums in our family." The constant fighting at home about my laziness for not working and staying in school dragged heavily on my school performance, and graduating was a struggle for me. But Estelle had performed her magic. There was no stopping me. She showed me the beauty of mathematics and instilled in me a powerful desire to succeed. She was my inspiration.

I went on to graduate school and dedicated my PhD thesis to her. My wife encouraged me to reconnect with Estelle at that juncture, since so many years had passed since I last saw her. I was reluctant to reconnect. I am not sure why. I knew she was teaching in a high school at that point, and without letting her know, I walked into her class one day, and she said, "Yes?" "Do you remember me?" I asked. And suddenly she lit up, "Alan!" she said, and hugged me. It was a very emotional moment. What began after that was a lifelong connection with this remarkable woman. A few years afterwards, she retired and moved away. For the next 40 years, each year I would write her, letting her know of my progress, and she would tell me about the things going on in her life. I would never fail to tell her, each year, how important she was in my life. When she could no longer read or write, I tried to keep in contact in other ways. I would send her stuff hoping that someone would read it to her. I didn't expect responses back. Recently my wife called to see how she was doing. "I am at the end of my time," she said. "I am sitting in my wheel chair only with memories, and they are good ones." This was so typical of who she was. She had an amazingly positive attitude about life and whatever came her way she handled with great dignity. What better role model could one have?

Estelle changed my life. In my classroom, I always try to emulate her. I bounce around the classroom, just as she did. I try to teach with great enthusiasm, and excitement. "Isn't this WONDERFUL?" I will often bellow out with a big smile. Some years ago, I received a message through a third party from a former student. He said, "It was because of you that I went on to get my PhD." Several messages of this nature came to me over the following years. And so, what goes around, comes around.

It is easy to get discouraged at times when teaching. We sometimes wonder if we make a difference. If we think back to what motivated us, the answer often is, another good teacher. So do we make a difference? The answer, clearly, is a resounding, unqualified, "YES!"

Endnote: On March 16, 2012, Estelle Gurin passed away, shortly after her 95th birthday.

ACCOMPLISHMENTS

Huzurbazar Named Deputy Director of SAMSI

Statistical and Applied Mathematical Sciences Institute (SAMSI), May 2012

Snehalata Huzurbazar, Associate Professor of Statistics at the University of Wyoming, has accepted the position of Deputy Director of the Statistical and Applied Mathematical Sciences Institute for the next two years. Huzurbazar will take a leave of absence from the University of Wyoming while she performs her duties at SAMSI, starting on July 9. She will also be a member of the research faculty at North Carolina State University in the Statistics Department.

“We are very impressed with Snehalata’s background and think she will bring a fresh perspective to the development of SAMSI’s programs and will be instrumental in our education and outreach efforts,” remarked Richard Smith, Director of SAMSI.

In her new position, Huzurbazar will help administer SAMSI programs and will help develop future programs. She will also be involved with the education and outreach efforts and will work on staff and personnel issues. Huzurbazar will be a part of the directorate, which comprises the director, three part-time associate directors and the deputy director.

Huzurbazar received her BA degree from Grinnell College in 1984, her MA degree in Economics from Vanderbilt University in 1988, and her PhD in Statistics from Colorado State University in 1992. She was an assistant professor at the University of Georgia from 1992–1995 and has been at the University of Wyoming since 1995. At UW, she has been an affiliate of the Science and Mathematics Teaching Center since 2003. She was also an adjunct professor of Women’s Studies from 2003–2008.

Huzurbazar spent some time at SAMSI last year as a visiting research fellow in the Analysis of Object Data program. One of the reasons she was attracted to the deputy director’s position was that SAMSI is the only NSF institute that explicitly includes a focus on statistics. She is particularly interested in encouraging young people to pursue careers in statistics and mathematical sciences. “Making an impact on outreach is really important to me. We often have trouble getting people into the mathematical sciences. I think we need to do a better job attracting students into mathematical



Snehalata Huzurbazar

sciences and inform them about various career options,” said Huzurbazar.

Much of Huzurbazar’s recent time has been spent building collaborations with colleagues in a variety of disciplines ranging from evolutionary bioinformatics to the geosciences, broadly defined. In evolutionary bioinformatics, she is working on the statistical issues surrounding the data generation pipelines. “Genomes for various species are sequenced. Then the data from the sequenced genomes are run through all kinds of computer programs in order to obtain what is used as the final ‘data’ that biologists model. We’ve been concerned that we are not taking into account the effects of the criteria used within these different pipelines on the final analyses and inferences that researchers obtain,” remarked Huzurbazar.

In the geosciences she works with colleagues from glaciology, sedimentology, chemical and petroleum engineering and restoration ecology. She spent 2004–5 at the Institute of Arctic and Alpine Research in Boulder, Colorado. Some of the chemical engineering and sedimentology work involves modeling distributions of sand particles or water-in-oil emulsion particles using particle or grain-size distributions. The glaciology problems are about modelling 3-dimensional data obtained from boreholes in glaciers in order to study how glaciers deform over time.

SAMSI is a national institute that is forging new syntheses of the statistical and applied mathematical sciences with disciplinary sciences to confront important data- and model-driven scientific challenges. It is based in Research Triangle Park, North Carolina. SAMSI is a partnership of the

National Science Foundation with the consortium of Duke University, North Carolina State University, the University of North Carolina at Chapel Hill, and the National Institute of Statistical Sciences.

Ricardo Cortez Awarded Blackwell-Tapia Prize

The National Blackwell-Tapia Committee recently announced that Professor Ricardo Cortez of the Mathematics Department at Tulane University was awarded the 2012 Blackwell-Tapia Prize. The prize recognizes a mathematical scientist who has contributed significantly to research in his or her field of expertise and who has served as a role model for mathematical scientists and students from underrepresented minority groups or has contributed in other significant ways to addressing the problem of the underrepresentation of minorities in mathematics. Dr. Cortez is internationally regarded as a leading researcher in fluid dynamics and mathematical modeling. He has also been a leader in undergraduate mentoring and the development of training opportunities for underrepresented minority students in the mathematical sciences. Cortez will be the guest of honor at the Seventh Blackwell-Tapia Conference at the Institute for Computational and Experimental Research in Mathematics (ICERM) at Brown University on November 9–10, 2012. For more information, please visit: <http://icerm.brown.edu/blackwell-tapia-2012>.

Mathematics Programs that Make a Difference 2012

Citation 2012: The AMS recognizes the **Mathematical Sciences Research Institute (MSRI)** for its efforts to encourage students from underrepresented groups to continue in the study of mathematics.

The program at MSRI has been a leader for many years in efforts to promote diversity in mathematics. Their research workshops showcase the accomplishments of women and encourage their participation in mathematical research. MSRI coordinates career development and outreach programs for all levels, from K–12 teachers to full professors. The conference for African American Researchers in the Mathematical Sciences was founded at MSRI in 1995. This conference has been credited by many African American graduate students as providing the spark and mentoring needed to carry them through to the PhD.

AWM Statement on Engage to Excel

Approved by the Executive Committee, March 2012

In February 2012, the Presidential Council of Advisors on Science and Technology (PCAST) released its report *Engage to Excel: Producing One Million Additional College Graduates with Degrees in Science, Technology, Engineering, and Mathematics*. The Association for Women in Mathematics applauds enthusiastically the goals of *Engage to Excel* and many of its strategies and action items. We strongly support the recommendations that instruction be informed by empirical research and that a Presidential Council on STEM Education be created with leadership from diverse segments of the STEM populations.

We hope that mathematicians and mathematics education researchers who are active in mathematics classrooms will be involved in the new Presidential Council on STEM Education and in writing future PCAST reports. The mathematics community would like the opportunity to collaborate on projects that may result from the February 2012 PCAST report. The best way for the United States successfully to increase the number of STEM majors is to build on known successes and improve mathematics education, through collaborative and constructive efforts. Everyone who teaches mathematics or does research in mathematics—mathematicians, mathematics education researchers, K–12 teachers of mathematics—has much to contribute to the effort to increase STEM participation.

Mathematicians and mathematics education researchers are already addressing many of the issues raised in the report. There is significant overlap in the scientific and mathematical practices described in the science K–12 framework (created by a National Research Council committee) and in the K–12 Common Core State Standards for Mathematics (created by mathematicians, mathematics education researchers, teachers, and others). In spite of the historical lack of adequate resources for education research, there is a body of research on teaching and learning undergraduate mathematics that the report writers may be unfamiliar with. The Mathematics Association of America (MAA) is conducting an NSF-funded study of Calculus I instruction with the goal of measuring “the various characteristics of calculus classes that are believed to influence student success.” Eight successful programs are

continued on page 22

being identified and will be studied in depth at a wide range of higher education institutions. There is an MAA special interest group on Research in Undergraduate Mathematics Education (RUME) and there is a book series on Research in Collegiate Mathematics Education published by the Conference Board of the Mathematical Sciences. Uri Treisman, currently the director of the Charles A. Dana Center at the University of Texas at Austin, developed the highly successful Emerging Scholars Program for increasing the number of underrepresented minority students in mathematics.

Mathematicians have also been involved in innovative new ideas for curriculum and learning experiences. The Math & Bio 2010: Linking Undergraduate Disciplines program conceives of a new paradigm that productively links the fields of mathematics and biology. Many mathematicians are interested and involved in the effort to advance computer-adaptive instructional design. Efforts to improve online homework systems are ongoing. The NSF-funded GoodQuestions Project at Cornell is an example of a successful program to incorporate polling devices into math courses.

There are other important bodies of research and curriculum development that can be found in Further Mathematics Education Curriculum and Research Resources below.

While we are expressing overall praise for the report and clear support of its goals, we have grave concerns about some statements and action items in the report. Our most serious concern centers around the third subitem of Action 3-1 of Report:

College mathematics teaching and curricula developed and taught by faculty from mathematics-intensive disciplines other than mathematics, including physics, engineering, and computer science.

The rationale for Recommendation 3 discusses the first two years of college-level mathematics instruction and asserts:

This content is fundamentally different from how a pure mathematician thinks about mathematics or knows how to use it, which is problematic for teaching students the skills they need. Discipline-based education on effective undergraduate mathematics teaching also appears less developed when compared with other STEM fields.

We find this statement problematic for several reasons. College mathematics departments must provide remedial instruction for underprepared college students, teach calculus and statistics courses that are required by many other STEM fields, as well as teach courses that will appeal to and prepare future mathematicians; no other STEM field faces these challenges. Today many research mathematicians don't consider themselves to be *either* pure or applied mathematicians; the distinction between the subgroups is continually blurring. How is the way a research mathematician thinks or her knowledge of how to use mathematics an impediment in teaching mathematics skills at any level? What content are the report authors referring to and how does this content differ from the thinking of research mathematicians? We believe that many aspects of mathematical thought are conducive to an understanding that facilitates the acquisition of valuable skills.

We agree that teaching the computational and algorithmic aspects of mathematics without focus on the underlying concepts and principles is ineffective in the long run. Studies by cognitive scientists on "learning with understanding" (e.g., the work of VanLehn, 1983) suggest that teaching students to memorize procedures without concepts or meaning makes it difficult for students to distinguish correct procedures from incorrect ones, leading them to make persistent errors. We believe that our responsibility as mathematicians is to help students understand basic principles that can then be applied in diverse contexts, especially in courses in the various STEM disciplines.

Mathematical ways of thinking—in both pure and applied contexts—have led to many scientific advances, and should not be of secondary importance in the efforts to increase STEM majors or the quality of students completing a STEM degree.

In the past, funding for education research has been scarce and universities have not rewarded course development by scientists, mathematicians, and education researchers. We agree that additional resources must be devoted to this important research. We would like PCAST to address the problem of how to shift resources and work demands to recognize the importance of teaching at research universities. It is clearly not enough to post learning goals on departmental websites (see p. 12 of the report).

To sum it up, for this vitally important effort to succeed we must collaborate together rather than exclude any segment of the STEM leadership from contributing to the success of the mission to increase the numbers in STEM fields.

Further Mathematics Education Curriculum and Research Resources

Assessment and Learning in Knowledge Spaces (ALEKS) was developed from research at New York University and the University of California, Irvine, by a team of software engineers, mathematicians, and cognitive scientists with the support of a multi-million-dollar grant from the National Science Foundation.

<http://www.aleks.com/> and http://www.aleks.com/about_aleks/research_behind

Carnegie Foundation for the Advancement of Teaching Study of Developmental Mathematics is funded by six foundations; working with community college students to make them more prepared for college level stat/math work; STATWAY and QUANTWAY replace traditional courses; the former prepares students for a year-long college level sequence in statistics and the latter gives students math background to pursue a number of options.

<http://www.carnegiefoundation.org/developmental-math>

Emerging Scholars Program of Uri Treisman for students from groups underrepresented in mathematics, developed at Berkeley in the late 1970s and early 1980s.

http://professionals.collegeboard.com/profdownload/pdf/calcandcomm_3947.pdf

The GoodQuestions Project at Cornell University for effectively using polling devices in mathematics courses.

<http://www.math.cornell.edu/~GoodQuestions/>

MAA Curriculum Development Resources

<http://www.maa.org/programs/currdev.html>

MAA Project Characteristics of Successful Programs in College Calculus surveyed over 700 instructors and 14,000 students and is now identifying successful programs in Calculus I at eight institutions, ranging from community colleges to PhD-granting institutions. It will do in-depth case studies of these programs.

<http://www.maa.org/cspcc/>

MAA Special Interest Group on Research in Undergraduate Mathematics

http://sigmaa.maa.org/rume/Site/About_SRUME.html

The Mathematical Education of Teachers II (MET 2). The February 2012 draft version is an update of the MET report published by the Conference Board of the Mathematical Sciences (CBMS) in 2001. CBMS is an umbrella organization consisting of sixteen professional societies, all of which have as one of their primary objectives the increase or diffusion of knowledge in one or more of the mathematical sciences.

www.cbmsweb.org

Math & Bio 2010: Linking Undergraduate Disciplines

<http://www.maa.org/mtc/projectreport.html>

NSF-funded Research and Program of mathematician Jerome Epstein designed for underprepared STEM students.

<http://www.sci.ccnycuny.edu/~rstein/percpaps/epstein.pdf>

Research from the Charles A. Dana Center of the University of Texas at Austin (Uri Treisman, Director)

<http://www.utdanacenter.org/products/research.php>

Research in Collegiate Mathematics Education book series

http://www.cbmsweb.org/Issues/issues_books.htm

Research on Inquiry-Based Learning in College Mathematics by Sandra Laursen at UC Boulder

<http://www.colorado.edu/eer/research/steminquiry.html>

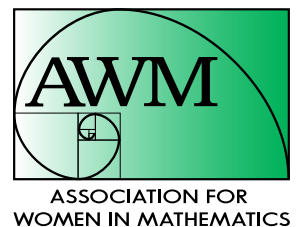
Research on Undergraduate Mathematics (RUME) Journals

<http://sigmaa.maa.org/rume/journals.html>

Reference

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OPPORTUNITIES

Call for Nominations: CRM-Fields-PIMS Prize

The Centre de recherches mathématiques (CRM), the Fields Institute, and the Pacific Institute for the Mathematical Sciences (PIMS) invite nominations for the joint CRM-Fields-PIMS prize, awarded in recognition of exceptional research achievement in the mathematical sciences. The candidate's research should have been conducted primarily in Canada or in affiliation with a Canadian university.

The prize was established as the CRM-Fields Prize in 1994. Renamed in 2005, the 2006 and later prizes were awarded jointly by all three institutes. Previous recipients are H.S.M. Coxeter, George A. Elliott, James Arthur, Robert Moody, Stephen A. Cook, Israel Michael Sigal, William T. Tutte, John Friedlander, John McKay, Edwin Perkins, Donald Dawson, David Boyd, Nicole Tomczak-Jaegermann, Joel Feldman, Allan Borodin, Martin Barlow, Gordon Slade, Mark Lewis and Stevo Todorcevic.

The selection committee formed by the three institutes will select a recipient for the 2013 prize on the basis of outstanding contributions to the advancement of the mathematical sciences, with excellence in research as the main selection criterion.

A monetary prize will be awarded and the recipient will be asked to present a lecture at each of CRM, the Fields Institute, and PIMS.

Nominations should be submitted by **November 1, 2012** by at least two sponsors of recognized stature, and should include the following elements: three supporting letters, curriculum vitae, list of publications, and up to four preprints. Nominations will remain active for two years. During any academic year, at most one prize will be awarded.

Submit files to nominations@pims.math.ca. Only electronic submissions (of a single PDF file) will be accepted.

Computational Challenges in Probability

Modern explorations in science, technology and medicine increasingly demand complex stochastic models. Computational and theoretical advances are needed in order to formulate, analyze, apply and interpret these models. Recent years have witnessed a remarkable interplay between

computation and probability. On the one hand, probabilistic techniques have led to powerful computational methods such as Markov chain Monte Carlo algorithms, while on the other hand the calculation of probabilistic quantities such as modes and marginals of high-dimensional distributions and the analysis of data from random samples has posed several computational challenges.

This semester program (September 5 – December 7, 2012) and its associated workshops aim to bring together leading experts and young researchers who are advancing the use of probabilistic and computational methods to study complex models in a variety of fields. The goal is to identify common challenges, exchange existing tools, reveal new application areas and forge new collaborative efforts. Tutorial sessions will be held prior to each workshop. The associated workshops are: Bayesian Nonparametrics, September 17–21; Uncertainty Quantification, October 9–13; Monte Carlo Methods in the Physical and Biological Sciences, October 29 – November 2; and Theoretical Analysis of Monte Carlo Methods, November 28–30.

The program is organized by: Jose Blanchet, Columbia University; Paul Dupuis, Brown University; Roger Ghanem, University of S. California; George Karniadakis, Brown University; Kavita Ramanan, Brown University; Boris Rozovsky, Brown University; and Eric Vanden-Eijnden, New York University.

ICERM welcomes registrations for long- and short-term visitors who wish to participate in this program, work with colleagues, and form new collaborations. Support for local expenses may be provided. Applications for funding may be submitted at any time and will be considered as long as funds and space remain available. ICERM encourages women and members of underrepresented minorities to apply and participate. Applications can be submitted online at <http://icerm.brown.edu/register>.

Sloan Research Fellowships

The Alfred P. Sloan Foundation is pleased to invite nominations for Sloan Research Fellowships. The deadline for receipt of nominations is **September 15, 2012**. Candidates must be members of the regular faculty of a college or university in the United States or Canada and be nominated by a department chair or other senior researcher. Direct applications are not accepted. Eligibility criteria and further information may be found at www.sloan.org/fellowships.

Letters

AWM joined numerous organizations and institutions as signatories to the two letters below. The first was sent by CNSF and the second by AAAS.

To the Senate:

As representatives of U.S. science, engineering, and higher education organizations, we write to you in strong support for the federal research and development budget of the National Science Foundation (NSF), and its mission—created over 60 years ago—to advance research across a broad spectrum of disciplines, research that has fueled American economic growth for decades.

NSF is unique among federal agencies in that it supports **all** disciplines in a balanced portfolio that uses the scientific peer review system as the foundation for awarding research grants based on merit.

As you prepare to debate the Commerce, Justice and Science (CJS) appropriations bill for fiscal year 2013, the undersigned organizations urge you to reject attempts to reduce funding for NSF. We also stand in strong opposition to legislative attempts to micromanage NSF and undermine the merit review process by singling out specific programs for elimination as recently occurred in the House.

In 2006, Alan Leshner, CEO of the American Association for the Advancement of Science, testified before the Senate in support of NSF research: “Every major issue facing modern society and every major issue facing our economic competitiveness will ultimately be multidisciplinary in nature ... [requiring] the integration of the physical sciences or biological sciences with the social and behavioral sciences.”

We recognize the challenge that our nation faces in addressing the deficit and revitalizing our national economy. However, eliminating disciplines, such as the House did with respect to political science, sets a dangerous precedent that, in the end, will inhibit scientific progress and restrain our international competitiveness economically and with regard to national security. Congress should exercise its oversight responsibilities, but second-guessing the scientific process could have a chilling effect on scientists and young people considering a future in science. The country cannot afford to lose the incredible talent, experience, and energies of its scientists, regardless of their discipline.

Therefore, the undersigned organizations again urge you to protect the integrity of the scientific enterprise by ensuring that the NSF and its independent scientific panels determine where the best scientific opportunities are and how to absorb any potential reductions to its budget. Allocating federal investments competitively through scientific merit review is the very process that has led this country to be the world leader in science. We encourage you to provide Congressional oversight by protecting that process rather than allowing others to threaten critical contributions to our innovative spirit and knowledge base.

Thank you for your time and consideration.

Dear Speaker John Boehner and Minority Leader Nancy Pelosi,

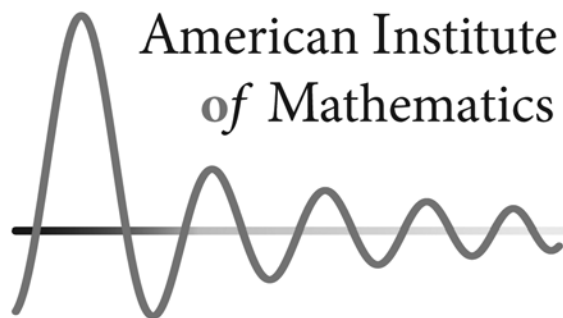
As representatives of U.S. science, engineering, and higher education organizations, we write to you to express our deep concern regarding amendments that were passed in the Digital Accountability and Transparency Act (DATA Act, H.R. 2146) in the House and the 21st Century Postal Service Act (S. 1789) in the Senate, which would place severe restrictions on government employees’ abilities to attend meetings and conferences. We represent hundreds of thousands of scientists, engineers, and mathematicians—many of whom work for the federal government—across a broad spectrum of disciplines.

... The free exchange of scientific ideas and information is crucial to advancing science and innovation, and conferences are a standard mechanism for the transfer of information among scientists and engineers.

We recognize that Congress has a responsibility to prevent wasteful government spending. We are concerned, however, that the language in the amendments would inadvertently impede the free flow of scientific information and the professional development of scientists and engineers. This would potentially work against critical national goals related to national security, public health, science education, innovation and competitiveness....

The undersigned organizations urge you to protect the integrity of the scientific enterprise and encourage you to allow greater flexibility for government employees to attend scientific and technical conferences organized or supported by professional societies and non-governmental organizations.

ADVERTISEMENTS



American Institute of Mathematics

AIM, the American Institute of Mathematics, sponsors week-long activities in all areas of the mathematical sciences with an emphasis on focused collaborative research.

Call for Proposals

Workshop Program

AIM invites proposals for its focused workshop program. AIM's workshops are distinguished by their specific mathematical goals. This may involve making progress on a significant unsolved problem or examining the convergence of two distinct areas of mathematics. Workshops are small in size, up to 28 people, to allow for close collaboration among the participants.

SQuaREs Program

AIM also invites proposals for a new program called SQuaREs, Structured Quartet Research Ensembles. More long-term in nature, this program brings together groups of four to six researchers for a week of focused work on a specific research problem in consecutive years.

More details are available at:

<http://www.aimath.org/research/>

deadline: November 1



AIM seeks to promote diversity in the research mathematics community. We encourage proposals which include significant participation of women, underrepresented minorities, junior scientists, and researchers from primarily undergraduate institutions.

Tenured Faculty Operations Research & Information Engineering Cornell University

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.

Multiple tenured faculty positions in Operations Research and Information Engineering are available at Cornell's new CornellNYC Tech campus in New York City. Faculty hired in these positions will be tenured professors in the School of Operations Research and Information Engineering, which will span the Ithaca and New York City campuses.

Subject areas of interest include optimization, applied probability and statistics. Application areas of interest include information technology modeling, logistics, and health care operations. Applicants must hold a Ph.D. and have demonstrated ability to conduct outstanding research and education at the level of tenured faculty in the School of Operations Research and Information Engineering. Applicants must also have a strong interest in the technology commercialization and entrepreneurship mission of the campus. In addition, interest in international programs and/or pre-college (K-12) education is advantageous.

To ensure full consideration, applications should be received by September 1, 2012, but we will begin reviewing and interviewing candidates before this date and continue until the positions are filled. Applicants should submit a curriculum vitae, brief statements of research and teaching interests, and the names and contact information of at least three references on-line at <https://academicjobsonline.org/ajo/jobs/1516>.

Cornell University is an inclusive, dynamic, and innovative Ivy League university and New York's land-grant institution, with its main campus in Ithaca, NY, its medical campus on the Upper East Side of Manhattan, and its new CornellNYC campus planned for Roosevelt Island in New York City. The University's staff, faculty, and students impart an uncommon sense of larger purpose and contribute creative ideas and best practices to further the university's mission of teaching, research, and outreach. These faculty positions are based in New York City at the CornellNYC Tech campus which will be located in temporary facilities until moving to its permanent home on Roosevelt Island.

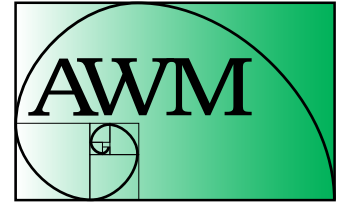
Find us online at <http://hr.cornell.edu/jobs>
or [Facebook.com/CornellCareers](https://www.facebook.com/CornellCareers)



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

2012–2013 Individual Membership Form

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ASSOCIATION FOR
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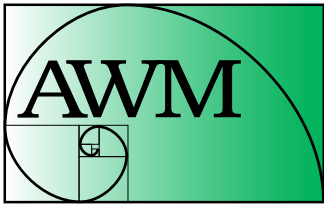
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