ASSOCIATION FOR WOMEN IN MATHEMATICS

Newsletter

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The purpose of the Association for Women in Mathematics is

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

IN THIS ISSUE

PRESIDENT'S REPORT

I wrote my report for the previous newsletter in January after the attack on the US Capitol. This newsletter, I write my report in March after the murder of eight people, including six Asian-American women, in Atlanta. I find myself wondering when I will write a report with no acts of hatred fresh in my mind, but then I remember that acts like these are now common in the US. We react to each one as a unique horror, too easily forgetting the long string of horrors preceding it. In fact, in the time between the first and final drafts of this report, another shooting has taken place, this time in Boulder, CO. Even worse, seven mass shootings have taken place in the past seven days.[1] Only two of these have received national attention. Meanwhile, it was only a few months ago in December that someone bombed a block in Nashville. We are no longer discussing that trauma.

Many of these events of recent months and years have been fomented by internet communities that foster racism, sexism, and white male supremacy. As the work of Safiya Noble details beautifully, tech giants play a major role in the creation, growth, and support of these communities. The tech world is a major employer of mathematicians, and we have a responsibility—an urgent one—to push for more oversight and more corporate responsibility, both as individuals and as a community. I call on AWM members to advocate for thoughtful regulation of these powerful and culture-shaping institutions that are currently providing the platform for existential threats to the health and safety of our communities, especially communities of minoritized racial and ethnic groups, gender minorities, and/or LGBTQ+ folks. We need to face honestly the ways in which US culture—and our scientific culture within it—has supported violence, and work to build a less violent future. This will not happen until we recognize the commonplace nature of these terrible events, how these events are connected to everyday discrimination, how the same underlying causes give rise to both.

New AWM staff: Changing gears to a more positive note, we are pleased to welcome Samantha Faria as AWM's Managing Director. Samantha replaces Robin Nelson who left us earlier this year. We are also pleased to welcome Beth Donovan as Program Management Consultant. Together with our Executive Director, Darla Kremer, these are the people who keep AWM organized and on track. Thanks to the three of you!

New AWM journal, *La Matematica*: I am excited to announce the launch of AWM's first research journal, *La Matematica*, now open for submissions. The journal

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[1] https://www.cnn.com/2021/03/23/us/7-mass-shootings-7-days-trnd/index.html

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*

publishes a broad range of research in pure, applied, and computational math, as well as math history and math education. Articles will be written so that results and context (if not methods) will be accessible to readers from outside narrow specializations. The journal will implement a thoughtful review process designed to reduce bias through doubly-anonymous reviews, and to minimize time to decision on manuscripts. Our reviewers will write constructive reviews that should help improve manuscripts whether or not they are accepted at *LaMa*. We also plan to gather data to ensure that authors have a good experience during the review process and that our acceptance rates are not demographically biased. We will share the resulting data analysis with the AWM community on a regular basis. I look forward to working with our incredible editorial board and my co-Editors-in-Chief: Ami Radunskaya, Michelle Manes, and Donatella Danielli. Special thanks go to Karoline Pershell and Kristin Lauter who did much of the preliminary work to bring this journal to life, and to Marc Strauss and Dimana Tzvetkova at SpringerNature who provided exceptional support during the journal's development and launch.

The first issue of the quarterly journal will appear in January 2022, highlighting work of AWM prize winners and past presidents in honor of AWM's 50th anniversary. We will showcase the research from these solicited articles in a special session at JMM 2022, a session which will also include a discussion of how we came to start a journal and how we made various equity-related decisions along the way. Unsolicited articles will appear starting in the second issue, March 2022.

We invite you to join this new effort, as a reviewer or by submitting an article! See https://www.Springer.com/journal/44007.

Continuing effects of the pandemic: The pace of vaccinations against COVID-19 has taken off, with now over a million vaccinations administered and predictions of widely available vaccinations starting in early May. I will receive my second dose this afternoon, and confess to feeling something like optimism for the first time in over a year. As we emerge back into the world, let's keep the knowledge we gained during this time.

There's the disproportionate impact on different populations. Who can go back to normal and who has seen their lives destroyed? Who benefited from the shut down and who is barely hanging on? Some recent publications document these disparities for the professoriate (which, as a whole, has mostly survived the pandemic) and to make recommendations for mitigation. *PLOS Biology* published a piece on academic mothers.[2] The National Academy of Sciences released a report on the impact of the pandemic on women in STEMM.[3] The *Chronicle of Higher Education* shared survey results that show a massive uptick of burnout on academics, with more than half now considering leaving academia.[4] What are we doing as a field to support our members? What are our institutions doing to address these issues that can easily become existential threats? How are we ensuring that the most vulnerable members of our community are receiving support?

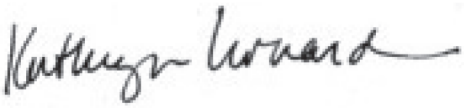
[2] https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001100

[3] https://www.nap.edu/catalog/26061/impact-of-covid-19-on-the-careers-of-women-in-academic-sciences-engineering-and-medicine

[4] https://www.businesswire.com/news/home/20210225005616/en/Fidelity-Investments-The-Chronicle-of-Higher-Education-Study-More-Than-Half-of-College-and-University-Faculty-Considering-Leaving-Teaching-Citing-Burnout-Caused-by-Pandemic

There's also the compassion and understanding we showed one another. We were flexible with deadlines. We found funding and time to put technological tools in the hands of those who can't afford them. We provided multiple modes of access to conferences and other events. We extended grace to one another. We assumed everyone was doing the best they could in the circumstances. We were conscious that others might be facing extreme challenges. All these actions have the same effect outside a pandemic. As we emerge back into the world, let's continue to treat each other gently. Until then, please stay safe and healthy.

Kathryn Leonard



Kathryn Leonard
March 24, 2021
South Pasadena, CA

PRESIDENTS' REFLECTIONS

Column Editors: Janet Beery, University of Redlands; Francesca Bernardi, Worcester Polytechnic Institute; Kayla M. Bicol, Sysco; Eva Brayfindley, Pacific Northwest National Laboratory; Cathy Kessel, consultant

This is the fifteenth in a series of "Presidents' Reflections," articles by past presidents of the AWM that are intended to help us take stock of where we are and where we should be going, and to consider what we want the organization to be at its 50th anniversary. As always, the *AWM Newsletter* welcomes your suggestions and comments in letters to the editor.

Barbara Lee Keyfitz was the seventeenth president of AWM (2005–2007). For more about Keyfitz, see her web page: https://people.math.osu.edu/keyfitz.2.

Reflections on a Presidential Time

Barbara Lee Keyfitz

I'm honored to have been asked to contribute an article about my term as president of AWM (February 2005 to January 2007). Unlike many of my predecessors and successors I did not advance any new initiatives. But somehow we managed to get through it, and what follows is a somewhat blurred summary.

So, first the very bright part of my term. My husband is Marty Golubitsky, and my term as president of AWM coincided (within a month at either end) with his term as president of SIAM. In addition, Jim Arthur, my college classmate, became president of the AMS at exactly the same time as my office at AWM began. Furthermore, I was director of the Fields Institute in Toronto at that point, and, though Marty was not based in Toronto, he spent one semester there and visited

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Send all queries and all *Newsletter* material except ads and queries/material for columns to Anne Leggett, amcdona@luc.edu. Send all book review queries/material to Marge Bayer, bayer@math.ku.edu. Send all education column queries/material to Jackie Dewar, jdewar@lmu.edu. Send all media column queries/material to Sarah Greenwald, appalachianawm@appstate.edu and Alice Silverberg, asilverb@math.uci.edu. Send all student chapter corner queries/material to Emek Kose, student-chapters@awm-math.org. Send everything else, including ads and address changes, to AWM, awm@awm-math.org.

frequently, so the three of us often met for a "presidents lunch" and compared notes. Professionally and socially, the simultaneous presidencies were a peak experience. One consequence of Jim's being president of the AMS was that he had a part at the 2005 Abel Prize Ceremony, when my thesis advisor, Peter Lax, won the prize. Since Peter's "society" was the AMS, the AMS president was invited to make a presentation at the formal banquet at the Royal Palace that is part of the ceremony. And when Penny Arthur decided that she did not want to attend the three-day-long festivities, Jim managed to wangle an invitation to me from the authorities. Meeting the King of Norway, dinner at the Royal Palace—quite a thrill.

My term began with two unrelated crises. First, on January 15, 2005, Lawrence H. Summers, then the president of Harvard University, opined that one reason for women's lack of participation comparable to men's in scientific careers was a difference in innate ability between women and men. The scientific world, at least the part of it that I live in, blew up. For weeks, no one could talk or write about anything else, and AWM was of course pressured to react. A major contribution from AWM was that Carolyn Gordon's rejoinder letter was published in the *New York Times*.

The controversy did not die down. My favorite article, which I still look up and read occasionally, was an Op-Ed published in the *Washington Post* by Meg Urry, an astrophysicist at Yale (and a great supporter of women in mathematics), titled "Diminished by Discrimination We Hardly See."[1] Sometimes I imagine a comma between "Discrimination" and "We."

The second crisis, which did not make the newspapers but was a major preoccupation for the first six months of my term as president, was that the entire office staff of AWM's operation, then at the University of Maryland, resigned. There had been minor crises leading up to this. AWM is in the position of many small organizations of not being able to provide a route to promotion for talented and ambitious staff. Although AWM had benefited from goodwill and solidarity from employees who had helped the organization through many tough times, by the end of 2004 time was running out.

Carolyn Gordon, just finishing her term as AWM president, was the person who was first hit with the crisis; a small committee of us worked on possible solutions. We selected a small association management firm, STAT Association Management, Inc. It was an arrangement that worked well for about a decade. During the period that AWM's office was housed at the University of Maryland, AWM leadership had spent considerable time arbitrating office disputes, dealing with turf battles, pleading for charity from Maryland deans, and making decisions about different volunteers' priorities. One consequence of this focus on management of the organization was that the leadership had not been able to make changes that were needed as AWM grew out of its childhood into a mature, stable organization. The Strategic Plan that had been adopted toward the end of Carolyn's term was eagerly taken up by the new management association. Our management officer, Jennifer Lewis (whose title was "Managing Director"), was professional and helpful. Although AWM eventually outgrew STAT and the relationship ended, the arrangement was excellent during my tenure as president, especially as I was almost

[1] It can be found on the web at https://www.washingtonpost.com/archive/opinions/2005/02/06/diminished-discrimination-we-scarcely-see/9c69e9e6-c013-4f7c-a214-d410b0dbc565/.

ASSOCIATION FOR WOMEN IN MATHEMATICS

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The *AWM Newsletter* is freely available online.

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Website: https://awm-math.org
Updates: webmaster@awm-math.org

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AWM DEADLINES

AWM Fellows: May 15, 2021
AWM Louise Hay Award: May 15, 2021
AWM M. Gwenyth Humphreys Award: May 15, 2021
AWM Student Chapter Awards: May 15, 2021
AWM Travel Grants: May 15 and October 1, 2021
RCCW Proposals: July 1, 2021
AWM Workshop at JMM: August 15, 2021
AWM-AMS Noether Lecture: October 1, 2021
AWM-MAA Falconer Lecturer: October 1, 2021
AWM-SIAM Sonia Kovalevsky Lecture: October 1, 2021
AWM Alice T. Schafer Prize: October 1, 2021
AWM Dissertation Prize: October 1, 2021
Ruth I. Michler Memorial Prize: October 1, 2021

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simultaneously embarking on a new career as director of the Fields Institute—a role that was even more unfamiliar to me.

After STAT took over the management, my task was easy: implement the STRATEGIC PLAN that had been formulated the year before. The Strategic Plan stated that the immediate business was to re-organize the Executive Committee (EC) so that it operated like a traditional board of directors, supervising the association's business through a set of committee portfolios. Although I have not had anything to do with AWM governance for the past decade, this appears to have been successful, and the EC, which had formerly merely acted as a brake on initiatives of the president, now brings forward its own ideas.

The three longer-established mathematical societies—AMS, MAA, and SIAM—all run their own shops. In particular, the organizations manage sizeable staffs, supervised by a top-level employee, the "executive director." Although the executive director's main task is to manage the staff that keeps the operation running, the executive directors have usually been mathematicians, often recruited from academic ranks. To many members of any of those three societies, the executive director's name is the name they associate with the society. Of course, AWM is organized quite differently. Nonetheless, the idea of a "face" for the society, a helpmeet for the president, a mathematician who has some say in the day-to-day operations of the association, an employee (rather than a volunteer), someone with a personal, rather than merely professional, commitment to AWM's mission has been appealing to AWM from its founding, and the title "Executive Director" seemed appropriate for the person who, among other duties, would meet as a peer with the executive directors of the other three mathematical societies. There are nontrivial differences. The executive director at AWM operates on a parallel track to the managing director and the staff, and AWM does not have a large enough budget to hire a full-time person. We advertised a half-time position and hired an eminently qualified person. It was a brilliantly successful proof of concept, and since then AWM has always had an executive director. Whether it was a satisfactory position for the occupant is less clear. It was certainly a service to AWM.

While I was at Fields, I had quite a lot of interaction with the scientific director of BIRS (the Banff International Research Station) in Canada. Somehow the BIRS director was persuaded to offer "women" the opportunity to hold a week-long (a BIRS week is 5 days) workshop, September 24–28, 2006. (The fact that this period happened to include Rosh Hashanah might have had something to do with this week's being unclaimed, but I have no proof of this.) The workshop itself was delightful. Because BIRS is a partnership of Canada, the US, and Mexico, we had participants from all three countries. This was an opportunity to make new friends, compare cultures, and compare the situation for women in three different countries. We had proposed to write a report; the working sessions dealt with topics like hiring, department climate, work-life balance, and

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CALL FOR NOMINATIONS

2022 Louise Hay Award

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

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted. Nominations for members of underrepresented minorities are especially encouraged. The nomination documents should include: a one to three page letter of nomination highlighting the exceptional contributions of the candidate to be recognized, a curriculum vitae of the candidate not to exceed three pages, and three letters supporting the nomination. It is strongly recommended that the letters represent a range of constituents affected by the nominee's work. Nomination materials for the Hay Award shall be submitted online. See the AWM website at www.awm-math.org for nomination instructions. Nominations must be received by **May 15, 2021** and will be kept active for three years. For more information, phone 401-455-4042, email awm@awm-math.org or visit https://awm-math.org/awards/hay-award/.

professional development. It took another nine months (funny, that gestation period) for our report to be completed; we phrased it as a "call to action." (It can be found on the BIRS website, which publishes reports on all their workshops.[2]) It contained the synthesis of our discussions on steps that individuals, societies, funding agencies, mathematics departments, and other employers could take to improve the educational opportunities and the careers of women. Fourteen years later, much of it is outdated: many things we advocated have been implemented, and some others would now be considered ineffective. Nonetheless, at the time it attracted some attention. I am proud of the work that our conferees put into this.

The tragic origins of the Ruth I. Michler Memorial Prize are well-known: Ruth Michler was a young associate professor at the University of North Texas, spending a sabbatical leave at Northeastern in Boston when she was killed in a freak construction accident. When her parents received a large financial settlement, they approached Carolyn Gordon about using the money to benefit women mathematicians, and Ruth's father, the mathematician Gerhard Michler, and Carolyn launched the idea of endowing a visiting position at Cornell University, to be awarded competitively to a woman who had recently been promoted to associate professor.

The final negotiations between Cornell and AWM took place while I was president. In retrospect, it is interesting to recall the things we worried about. Would there be takers? Would Cornell honor the agreement, or would the endowment amount get absorbed into their general funds? Would AWM be organized enough to administer the award? Would Cornell try to take it away from AWM? The answers have turned out to be yes, yes, yes, and no.

As president, I represented AWM in the negotiations with Cornell. After everything was set up, I returned for the opening ceremony, joining Cathy Kessel, who was AWM president by then, and Sylvia Wiegand to welcome the first Michler awardee, Rebecca Goldin.

It was Cathy Kessel who set the Morawetz Conference in motion. She was prompted by a letter from Constance

[2] https://www.birs.ca/workshops//2006/06w5504/report06w5504.pdf.

Call for Nominations for the 2022 Class of AWM Fellows

The Association of Women in Mathematics Fellows Program recognizes members of any gender who have demonstrated a sustained commitment to the support and advancement of women in the mathematical sciences, consistent with the AWM mission: "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."

The following criteria are required for nominees to be considered for Fellowship.

- Nominees must have demonstrated an outstanding, sustained commitment to the support and advancement of girls and women in the mathematical sciences.
- Nominees should be a member of AWM at the time of their nomination.

In the majority of cases a nominee should be at least fifteen years into her/his/their career; graduate study counts as part of the career. Nominations will open April 1 and close **May 15, 2021**, so please participate in this year's selection process by nominating someone who you think deserves this recognition. Self-nominations are permitted. Nominations for members of underrepresented minorities are especially encouraged. The primary nominator need not be a current member of AWM but if not should have been one at some point in the past. Anyone can write a supporting letter, whether or not they are AWM members. Nomination packages consist of:

- a nomination letter from the primary nominator of at most two pages
- two supporting letters of at most two pages each, of which at least one is from a current AWM member
- a CV of 3 pages or less
- a suggested citation (for use when the award is announced) of 50 words or less.

Further information will be posted at the AWM Fellows page. At the request of the primary nominator, nominations can remain active for one additional year, and the nominator can update the application materials. Questions? Phone 401-455-4042, email awm@awm-math.org or visit awm-math.org/awards/awm-fellows/.

Reid (who was Julia Robinson's sister), suggesting that AWM honor Cathleen Morawetz on her eightieth birthday. Constance Reid might have been inspired by a number of "memorial" conferences AWM has held; she pointed out how great it would be to celebrate someone while they were alive. By then I was no longer president, but I was still at the Fields Institute, which seemed like an appropriate place to celebrate, since Cathleen had grown up in Toronto. As director, I did not have authority to select programs—we had a committee for that—but there was no question that this would be approved. In fact, Fields had not been very forward-looking about encouraging women to participate in and to lead activities. Women in the Canadian mathematics community had noticed that and complained about it. This was an excuse for me to approach the Board of Directors and ask for their agreement for an institutional policy to make sure women were represented on organizing committees and as speakers and participants. They gave it immediately. I was quite proud of them. Sometimes all you need to do is ask.

The meeting itself was glorious. One memorable event took place during the banquet. At that time, Elaine Riehm was doing research for a biography of John Charles Fields, the creator of the Fields Medal, and while combing the stacks of the University of Toronto Library, where many of J. C. Fields' records were stored, she came across the prototype for the medal itself. The medal was originally, and still is, struck by the Canadian Mint. The bronze prototype was in a small box, addressed to J. L. Synge. John Charles Fields, whose professional career was spent mainly at the University of Toronto, had been a principal organizer of the 1924 International Congress of Mathematicians in Toronto. He was a supremely gifted fundraiser (as we would now say), and at the end of the Congress had enough money left over to endow a prize. The details belong to a different article, but, sadly, Fields died before the project could take final shape, and Synge, the famous mechanician, then at the University of Toronto, undertook to see it completed. Hence this prototype was delivered to him, and somehow found its way into a drawer in the stacks of the library, where its existence was most likely unrecorded and unremembered. Cathleen Morawetz was Synge's daughter, and Elaine impulsively (and without authorization) removed it from the library to show Cathleen at the banquet. Of course, it was a great hit; Cathleen was touched and amused, and when Elaine took it back so that she could return it, Cathleen said, absolutely not: keep it! So now it sits in a safe place, periodically displayed, at the Fields Institute.

CALL FOR NOMINATIONS

The 2023 Noether Lecture

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

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

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be an additional letter of support. Nominations of members of underrepresented minorities are especially encouraged. The letter of nomination should include a one-page outline of the nominee's contribution to mathematics, giving four of her/their 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 1, 2021** and will be held active for three years. If you have questions, phone 401-455-4042, email awm@awm-math.org or see the website https://awm-math.org/awards/noether-lectures/

Shabnam Akhtari Wins Ruth I. Michler Memorial Prize

AWM and Cornell University are pleased to announce that Shabnam Akhtari, University of Oregon, has been awarded the 2021–2022 Ruth I. Michler Memorial Prize.

Shabnam Akhtari was selected to receive the Michler Prize to pursue her proposed research on classical Diophantine equations, in particular to study index form equations and their applications to understanding the structure of rings in algebraic number fields. Awarding this opportunity to Akhtari adds to the distinguished history of the Michler Prize. She is a stellar researcher who will have lasting impact in number theory and in mathematics.

The Cornell number theory group is thriving, thanks to recent hires which led to a boom of graduate students in the field. More broadly, in upstate NY there is a vibrant number theory community of over a dozen mathematicians who jointly run the Upstate Number Theory Conference. Akhtari should fit naturally into this group, allowing her to share her research and possibly begin new collaborations. She is a natural role model for the many upstate number theory graduate students and postdocs.

About her upcoming semester at Cornell, Akhtari says: "I am looking forward to spending a semester at Cornell focusing on my research. The opportunity to work with Professor Ravi Ramakrishna and other number theorists at Cornell and in the area is particularly exciting."

Akhtari earned her BS at Sharif University of Technology (Tehran), her MS at Simon Fraser University (Canada) and her PhD at the University of British Columbia (Canada). She has been a postdoctoral fellow at Queen's University, Kingston; at the Max Planck Institute for Mathematics, Bonn, and at the Centre de Recherches Mathématiques, Montreal. Since then she has been a faculty member in the Department of Mathematics at the University of Oregon, where she was promoted to Associate Professor in 2018. She has been awarded two single-researcher NSF grants, as well as two Simons Foundation fellowships.

Shabnam Akhtari

The Ruth I. Michler Memorial Prize was established through a generous donation from Ruth's parents Gerhard and Waltraud Michler of Essen, Germany. The award grants a mid-career mathematician a residential fellowship in the Cornell University Mathematics Department without teaching obligations. The Michler family established the memorial prize with the Association for Women in Mathematics to honor Ruth's commitment to the AWM mission of supporting women mathematicians. Cornell University was chosen as the host institution because of its distinctive research atmosphere and because Ithaca was Ruth's birthplace. At the time of her death, Ruth was in Boston as an NSF visiting scholar at Northeastern University. A recently promoted associate professor of mathematics at the University of North Texas, she died November 1, 2000 at the age of 33 in a tragic accident, cutting short the career of an excellent mathematician.

Marianna Csörnyei Named Noether Lecturer

The AWM and the AMS are pleased to announce that Marianna Csörnyei, Professor of Mathematics at the University of Chicago, will deliver the Noether Lecture at the 2022 Joint Mathematics Meetings to take place January 5–8 in Seattle, Washington.

Csörnyei received her PhD from the Loránd Eötvös University in Budapest in 1999. Before joining the faculty at the University of Chicago, she was a Research Fellow at the University College London from 1999 to 2003, a member of the Institute for Advanced Study in Princeton during the 2003–2004 academic year, and a Professor of Mathematics at the University College London from 2004 to 2011.

Csörnyei has made significant contributions to several areas of mathematical analysis, including geometric measure theory, functional analysis and real analysis. While she was still an undergraduate, she established a reputation as a brilliant problem solver, continuing her success from high school when she won a gold medal at the International Mathematical Olympiad. Later she worked on deep, innovative long-term projects. She is known, for example, for her results concerning various versions of the Kakeya needle problem and for her work on the structure of Lebesgue null sets in Euclidean spaces. The latter work is connected to questions concerning the possibility/impossibility of strengthening the Rademacher Theorem about the almost everywhere differentiability of Lipschitz functions, problems in partial differential equations and the calculus of variations, as well as to some combinatorial problems.

Marianna Csörnyei

Csörnyei was an invited speaker at the 2010 International Congress of Mathematicians and has given lectures at distinguished institutions around the world. In 2002, she won both the Whitehead Prize from the London Mathematical Society and the Royal Society Wolfson Research Merit Award. In 2008 she was awarded the Philip Leverhulme Prize for her work in geometric measure theory. In 2019 she was elected an External Member of the Hungarian Academy of Sciences.

AWM established the Emmy Noether Lectures in 1980 to honor women who have made fundamental and sustained contributions to the mathematical sciences. The lecture honors Emmy Noether (1882–1935), one of the great mathematicians of her time. She worked and struggled for what she loved and believed in. Her life and work remain a tremendous inspiration.

CALL FOR PROPOSALS

Research Collaboration Conferences for Women

The AWM works to establish and support research networks for women in all areas of mathematics research. In particular, the AWM RCCW Committee provides mentorship and support to new networks wishing to organize a research collaboration conference for women (RCCW). The Committee offers help finding a conference venue, developing and submitting a conference proposal, and soliciting travel funding for participants. Thanks to a National Science Foundation grant, some funding may be available through the AWM to support new RCCWs, especially interdisciplinary proposals and proposals that bring together researchers from traditionally underrepresented populations.

Mathematicians interested in organizing the first conference of a new RCCW are invited to submit a proposal to the AWM describing the conference topic, potential co-organizers and project leaders, and potential participants. Proposals should be no more than one page (PDF files only, please), and should be sent to awm.rccw@gmail.com. Deadlines for submission: **February 1** and **July 1**.

More information can be found at http://awm-math.org/programs/advance-research-communities/.

Vivette Girault Named Kovalevsky Lecturer

The AWM and SIAM have selected Vivette Girault, Professor Emerita at Sorbonne Université, CNRS, Laboratoire Jacques-Louis Lions, Paris, France, to deliver the 2021 Sonia Kovalevsky Lecture. Her lecture "From linear poroelasticity to nonlinear implicit elastic and related models" will be delivered at the SIAM Annual Meeting, to be held in virtual format, July 19–23, 2021.

Vivette Girault, Sorbonne Université, Paris, France, is an outstanding numerical analyst with a long and distinguished career who continues to have both deep and broad impact on computational science. Her work in finite element methods, computational fluid dynamics and mechanics is widely known and has been highly cited. The letters in support of this nomination suggest that what sets Professor Girault apart from others is her "uncompromising attitude towards making sure that she fully understands the underlying physics of the problems she works on," and this assessment explains her broad influence within as well as outside numerical analysis. Girault has also been a fantastic mentor and role model for many junior mathematicians, being "quick-witted, rigorous, and excellent, with a radiant and humble personality."

Girault was born in Nice, France; she attended high school in Caracas, Venezuela and received her undergraduate degree from McGill University in Montreal, Canada. She then returned to France to study numerical analysis and was appointed Assistant Professor of Applied Mathematics at the Université de Paris (renamed the Université Pierre et Marie Curie (UPMC), and now part of Sorbonne Université). Except for two years at the University of Houston, Girault's career was spent at UPMC.

Vivette Girault

Since retiring from UPMC in 2008, Girault has held visiting positions at the University of Pittsburgh, the University of Texas at Austin, Texas A&M University, and Rice University. With the close connection to Texas, Girault's research that was originally on the theory and discretization of Navier-Stokes equations, veered mostly to the theory and numerics of problems of complex fluids, problems of poroelasticity, and now fascinating problems of nonlinear implicit models introduced by K.R. Rajagopal.

The Kovalevsky Lecture honors Sonia Kovalevsky (1850–1891), the most widely known Russian mathematician of the late 19th century. In 1874, Kovalevsky received her Doctor of Philosophy degree from the University of Göttingen, and in 1883 she was appointed lecturer at the University of Stockholm.

AWM is *50*!

Association for Women in Mathematics

50th Anniversary
1971 - 2021

From its small but powerful beginning in 1971, to the expansive network in the mathematical sciences that it is today, AWM has a lot to celebrate in 2021! Our activities at the January JMM were virtual this year, due to the pandemic. The AWM Research Symposium originally planned for 2021 has been postponed until 2022. See https://awmmath.org/meetings/awm-research-symposium/ for the most up-to-date news.

The We Speak Series, held once a month in 2021, features women who have made a difference in the landscape of the mathematical sciences. These talks will be accessible for the advanced undergraduate student and are being held the final Friday of each month. On May 21 Dr. Carla Cotwright-Williams, Department of Defense, will speak, and on June 25, Dr. Erica Walker, Teacher's College, Columbia University.

AWM Essay Contest

Congratulations to all the winners of the 2021 AWM Essay Contest: Biographies of Contemporary Women in Mathematics! Many thanks to Johanna Franklin, Hofstra University, contest organizer, and to the other members of the committee, along with the many volunteer judges. 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 2021 Grand Prize essay appears after the list of this year's winners. To see the other prize-winning essays, visit https://awm-math.org/awards/student-essay-contest/2021-student-essay-contest-results/.

GRAND PRIZE WINNER

Student: Joy Wilde (Washington Connections Academy)
Title: Mathematical Homeruns
Interviewee: Emily Curtis (Seattle Mariners)

Undergraduate Winner

Student: Yangyang Li (Dartmouth College)
Title: Keeping It Cool: A Biography of Lori Siegel
Interviewee: Lori Siegel (Climate Interactive)

Undergraduate Honorable Mentions

Student: Lucy Conover (Pitzer College)
Title: Mathematical Wholeness: Sarah's Journey
Interviewee: Sarah Strong (High Tech High)

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CALL FOR NOMINATIONS

2022 M. Gweneth Humphreys Award

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

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

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted. Nominations for members of underrepresented minorities are especially encouraged. The nomination documents should include: a nomination cover sheet; a letter of nomination explaining why the nominee qualifies for the award; the nominee's vita; a list of female students mentored by the nominee during their undergraduate years, with a brief account of their post-baccalaureate mathematical careers and/or graduate study in the mathematical sciences; and supporting letters from colleagues and/or students. At least one letter from a current or former student of the candidate must be included.

Nomination materials for the Humphreys Award shall be submitted online. See the AWM website at awm-math.org for nomination instructions. Nominations must be received by **May 15, 2021** and will be kept active for three years at the request of the nominator. For more information, phone 401-455-4042, email awm@awm-math.org or visit https://awm-math.org/awards/humphreys-award/.

Undergraduate Honorable Mentions
continued

Student: Ingrid Ren (Brown University)
Title: The Poetry of Mathematics
Interviewee: JoAnne Growney (Bloomsburg University)

Student: Angie Wang (Claremont McKenna College)
Title: Asuman Aksoy: Reserving the Right to Think
Interviewee: Asuman Güven Aksoy (Claremont McKenna College)

Grades 9–12 Winner

Student: Angela Cai (Stuyvesant High School)
Title: Stepping Outside the Mold to Improv-e Mathematics
Interviewee: Ellen Eischen (University of Oregon)

Grades 9–12 Honorable Mentions

Student: Arielle Frommer (Marine Science Magnet High School of Southeastern Connecticut)
Title: CDR Meghan Steinhaus: Military Excellence and Mathematical Creativity
Interviewee: Meghan Steinhaus (United States Coast Guard Academy)

Student: Asmi Pareek (Sidwell Friends School)
Title: The Proof is in the Purpose
Interviewee: Yolanda Rolle (Sidwell Friends School)

Grades 6–8 Winner

Same as Grand Prize Winner.

Grades 6–8 Honorable Mentions

Student: Ben Hourdequin (Frances C. Richmond Middle School)
Title: "The Puzzle" In Life
Interviewee: Lori Siegel (Climate Interactive)

Student: Jada Martin (Westside Neighborhood School)
Title: Lighting the Way from Within
Interviewee: Cydney Bodenhamer (Westside Neighborhood School)

Student: Meera Srini (Columbus Academy)
Title: From Mangoes to Math
Interviewee: Padmini Veerapen (Tennessee Tech University)

Mathematical Homeruns

Joy Wilde, Washington Connections Academy

"This is the 240-pound catcher Jeremy Brown and as you know he is scared to run to second base. This guy is going to start him off with a fastball and Jeremy is going to take it to deep center. Here is what is really interesting, Jeremy is going to go for it. He is going to round first and he is going to go for it." (Jeremy trips and dives back to first base) "These are all of Jeremy's nightmares coming to life." — Pete

"Aw, they're laughing at him." — Billy

"Yes, and Jeremy's about to find out why. Jeremy's about to realize, the ball went 60 feet over the fence. He hit a home run and didn't even realize it." — Pete

The excerpt above from the film *Moneyball* is similar to the life of Emily Curtis. Just like Pete from *Moneyball*, Mrs. Curtis works as a Baseball Analyst for the Seattle Mariners. She loves math, knitting, and baseball. Curtis has always loved math, but she hadn't realized her true potential until a certain math teacher showed her.

Mr. Foor, pronounced "four," was Curtis's high school calculus teacher. She loved Foor because she knew that he was dedicated to making sure that she was the best possible student. Curtis said she really liked his class because it was planned and structured. She knew that in his class she would never be thrown a curveball. Even though Curtis has always loved math, before this she was "scared to run to second base." After taking his class, Curtis said, "Foor made me feel like I was good enough to be able to pursue math as a career."

With Foor's support, Curtis went to college wanting to pursue math. At first, she wanted to be an engineer. Later in the year, she decided she didn't really want to do that anymore. After she graduated from the University of Washington with her master's degree in applied math, she found a job interview for a data scientist, and she thought that was what she wanted to do. A data scientist uses data to help companies figure out how much money is going in and out. Curtis thought that this job would satisfy most of her mathematical interests. However, she was forgetting about one thing ... baseball!

When Curtis went in for her job interview, the person asked her about some of the projects that she had been working on for fun. ALL of these involved baseball. Curtis talked about

these projects with so much passion and interest because she truly loved baseball. However, when the interviewer asked her why she wanted to work as a data scientist for that company, she had the hardest time answering. She thought she should work there, but there was a little voice in the back of her head saying, "Baseball. Baseball is what you really love."

That night Curtis remembers talking to her now-husband and saying that she really thought she should try and get a job as a baseball data analyst. Although thousands of thoughts were going through her head about all the reasons why she couldn't do it, she remembered the way Foor used to make her feel. Then she decided it was time to "round first and go for it."

Curtis applied for a job as a data analyst for the Seattle Mariners. A little while later she got an email from the guy who was going to interview her. The email said that they had already filled the position and they didn't need to interview her. He left the door open and told her to reach out if she had any questions about her application or if she wanted any feedback.

Emily Curtis had tripped over the base. All of the negative things she had been saying came back. She was heartbroken that she hadn't gotten the job, and she started to give up. But Curtis just shook them away and remembered her love for the game. She loved baseball and she knew it was worth fighting for.

A few days later she emailed the guy back asking for some feedback on her work. He replied by saying they had just lost another person and that he would love to interview her for the job. Curtis excitedly went in for the interview a little while later. Afterward, she nervously waited to see if she got the job. When she found out she had, she was beyond herself with joy. Emily Curtis was officially a data analyst for the Seattle Mariners!

A few weeks into the job Curtis was still hesitant and nervous about making a mistake or ruining her chances in her career. She had "hit a home run and didn't even realize it." Curtis is one of the only women in her field at the Seattle Mariners. She had no idea that she had just paved a path for other women to pursue a mathematics career. Looking back, Curtis says she wishes she would have had more confidence in herself.

Now Curtis loves her job and thinks about how she can make the sport better every day. However, there is still one thing she wishes she could change. Curtis says, "If there was one thing I could change, it would definitely be to have a more diverse community. I wish that I saw more women, people of color, transgender, and nonbinary people in my field." Curtis knows that things aren't as bad as they used to be, but she also knows that we are far from perfect.

Curtis's word of advice for women who are thinking about entering the mathematical field is to be confident in themselves. Curtis wants everyone to know that when you hit a ball, don't be afraid to watch where it goes because maybe next time, you'll be the one with the home run.

CALL FOR NOMINATIONS

The Association for Women in Mathematics Dissertation Prize

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

To be eligible for the award graduate students must have defended their dissertation within the last two years (October 1, 2019 to September 30, 2021). They must either be a US citizen or have a school address in the US. The Prizes will be presented at the AWM Reception and Awards Presentation at the Joint Mathematics Meetings in Seattle, WA.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted. Nominations of members of underrepresented minorities are especially encouraged. The nomination should include: 1) a one to three page letter of nomination highlighting the exceptional mathematical research presented in the dissertation, 2) a curriculum vitae of the candidate not to exceed three pages, 3) a copy of the dissertation and 4) two letters supporting the nomination. Nomination materials should be submitted online at MathPrograms.org. The submission link will be available 45 days prior to the nomination deadline. Nominations must be received by **October 1, 2021**. If you have questions, phone 401-455-4042, email awm@awm-math.org, or visit awm-math.org/awards/awm-dissertation-prize/ for more information.

BOOK REVIEW

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

The Development of Women and Young Professionals in STEM Careers: Tips and Tricks, by Michele Kruger and Hannelie Nel, CRC Press, 2019. ISBN 978-0367334406

Reviewer: Marge Bayer

This book was written by engineers working in private industry in South Africa. It is directed mostly at young people working in industry, and for students who envision a career in industry. However, I think that young people in academia can translate much of the advice to their own setting. The other thing to know is that not very much of the book discusses issues of gender. The authors say that they are fans of Sheryl Sandberg's *Lean In*, which is often criticized for putting the onus on women to get ahead in corporate America. This book does not do that, but when it does give examples of particular challenges facing women in the workplace, it does not suggest solutions or responses.

By the way, the book is written in the first person, and that person is often identified as "Michele," so even though there are two authors, I will often refer to the authors in the singular.

The book encourages much self-reflection on one's motivations and goals, and how one functions at work. The first several chapters are about one's approach to a job or career. Chapter 1, "Passion for the Job," sounds like a pep talk. The reader is reminded that you will have a forty-year work life and that you should be proactive about determining what kind of career you want, not just what others around you want you to do. Find your passion. Find your niche in which your strengths are valued. (They recommend doing personality testing to identify some of those strengths.) Find role models. "I have female engineering and science role models who fight the good fight on a daily basis to turn around gender-based bias and promote gender parity." (I would certainly have liked examples of this.)

Under the term "Emotional Intelligence" the authors stress the importance of building relationships by "putting yourself in someone else's shoes." They suggest that this will make you stand out as effective among colleagues, because STEM workers are not expected to be empathetic. This may seem to be in contradiction to other advice in this

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 nominees may be at any level in their undergraduate careers, but must be undergraduates as of October 1, 2021. They must either be a US citizen or have a school address in the US. The Prize will be awarded at the AWM Reception and Awards Presentation at the January 2022 Joint Mathematics Meetings in Seattle, WA.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be at least one additional letter of support. Nominations of members of underrepresented minorities are especially encouraged. The letter of nomination should include, but is not limited to, an evaluation of the nominee on the following criteria: quality of performance in advanced mathematics courses and special programs, demonstration of real interest in mathematics, ability for independent work in mathematics, and performance in mathematical competitions at the local or national level, if any. With the letter of nomination, please include a copy of transcripts and indicate undergraduate level. Any additional supporting materials (e.g., reports from summer work using math, copies of talks, recommendation letters from professors, colleagues, etc.) should be enclosed with the nomination. All nomination material is to be submitted as ONE PDF file via MathPrograms.Org with a copy of transcripts included at the end of the file. The submission link will be available 45 days prior to the deadline. Nominations must be received by **October 1, 2021**. If you have questions, phone 401-455-4042, email awm@awm-math.org, or visit https://awm-math.org/awards/schafer-prize-for-undergraduates/.

chapter: Never care what others think of you. But apparently this latter is meant in a narrow sense: do not adopt the styles or interests or priorities of others, while at the same time relate to others with an understanding of their styles, interest and priorities.

I had some trouble with some statements in the third chapter, "Thinking Strategically about Your Career." To make the point that you should be visible at your workplace, she gives "The Story of a Bar Lady." Here she says that at her first job she would buy the food and drinks and serve them at the Friday afternoon social events. She believes that this helped her image, leading to promotion, when she was also recognized for doing good work. I question the kind of contribution this makes to professional advancement, while it continues the stereotype of women as helpers. In the same section, she says, "you will be known as the person [with] the right attitude, regardless of any typical hurdles such as age, gender, or race. You will be judged on merit and nothing else because you deserve it!" I don't suppose she is that naïve, but rather wants to encourage people to face the challenges with a positive attitude.

The chapter on Mentorship goes into some detail about mentoring and coaching, which is quite useful. The authors make the distinction between a mentor, who provides support over the long term, and helps you think through major career decisions, and a coach, who helps you figure out how to deal with day-to-day issues. Much of this chapter is about the responsibilities of both mentor and mentee. The last part deals with some warnings about the difficulties one will face in a career in STEM. This is another time when the issue of gender comes up, and I found some contradiction in the treatment of the issue. "Generally, this is still a level playing field and in the end, hard work takes them to graduation, regardless of gender" (referring to women in college; p. 36). "You will be treated differently as a woman/person of color/religious minority—advocate the advantages of diversity" (also p. 36).

The next chapter is on Leadership. A young person starting out may not yet see herself in a leadership position, but some of the advice is relevant for collaborations, even if one is not "the boss." In particular, listed at the end of the chapter are skills that are important in all careers, and for people at all stages of their career. These range from those involving our outward persona (public speaking, networking) to those involving more self-reflection ("bringing energy and positivity,"

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CALL FOR NOMINATIONS

The 2022 Etta Zuber Falconer Lecture

The Association for Women in Mathematics and the Mathematical Association of America (MAA) annually present the Etta Zuber Falconer Lecture to honor women who have made distinguished contributions to the mathematical sciences or mathematics education. These one-hour expository lectures are presented at the MAA MathFest each summer. While the lectures began with MathFest 1996, the title "Etta Zuber Falconer Lecture" was established in 2004 in memory of Falconer's profound vision and accomplishments in enhancing the movement of minorities and women into scientific careers.

The mathematicians who have given the Falconer lectures in the past are: Karen E. Smith, Suzanne M. Lenhart, Margaret H. Wright, Chuu-Lian Terng, Audrey Terras, Pat Shure, Annie Selden, Katharine P. Layton, Bozenna Pasik-Duncan, Fern Hunt, Trachette Jackson, Katherine St. John, Rebecca Goldin, Kate Okikiolu, Ami Radunskaya, Dawn Lott, Karen King, Pat Kenschaft, Marie Vitulli, Erica Walker, Izabella Laba, Talithia Williams, Pamela Gorkin, and Tara Holm. The 2021 lecture will be delivered by Bonita Saunders.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be at least one additional letter of support. Nominations for members of underrepresented minorities are especially encouraged. The letter of nomination should include an outline of the nominee's distinguished contributions to the mathematical sciences or mathematics education and address the nominee's capability of delivering an expository lecture. 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 1, 2021** and will be held active for two years. If you have questions, phone 401-455-4042, email awm@awm-math.org or visit https://awm-math.org/awards/falconer-lectures/ to learn more.

"being brave enough to be different"). Following that is a chapter on "Authority, Responsibility, and Ownership." The relationship between authority and responsibility is something everyone faces, but most of this chapter is concerned with the decision to start one's own business. This, I would guess, would be a far-off consideration for most of our readers.

Communication is, of course, always an issue. This chapter makes distinctions among communicating with clients (in academia, other STEM departments?), communicating with leadership, and communicating with peers and subordinates. An important section is on the pitfalls of email. Advice includes keeping emails clear and concise, not sending repetitive emails, and avoiding email when a response is needed right away. I might have added more about style—as faculty we often complain about emails from students that we consider rude, and I don't suppose poor practices in email writing disappear when students graduate.

The chapter on "Marketing and Selling" is definitely pitched to those working in a business that sells a product. But whether you like it or not, research mathematicians have to sell themselves and their work. No one likes or respects someone who is a blatant self-promoter, but one should not be secretive about one's accomplishments either. I remember a story of an Assistant Professor at University X. Everyone found him such a helpful colleague, and was sadly thinking of the day he would be gone because he wouldn't get tenure. He came up for tenure, and many in the department were so surprised that he had been doing excellent research all along. (He was easily awarded tenure.) This section would have been a good place to discuss the difference in expectations by gender.

Some of the later chapters concern issues that may be harder to translate to the academic world. I turn now to the last chapter, "Attracting, Developing, and Retaining Women Engineers and Scientists." The title is a bit misleading. Remember that the target audience is young people starting

CALL FOR NOMINATIONS

The 2022 Kovalevsky Lecture

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

The mathematicians who have given the prize lecture in the past are: Linda R. Petzold, Joyce R. McLaughlin, Ingrid Daubechies, Irene Fonseca, Lai-Sang Young, Dianne P. O'Leary, Andrea Bertozzi, Suzanne Lenhart, Susanne Brenner, Barbara Keyfitz, Margaret Cheney, Irene M. Gamba, Linda J.S. Allen, Liliana Borcea, Éva Tardos, Catherine Sulem, and Lisa Fauci. The 2021 lecture will be delivered by Yvette Girault.

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. Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be an additional letter of support. Nominations of members of underrepresented minorities are especially encouraged. 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 **October 1, 2021** 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 awm-math.org/awards/kovalevsky-lectures/ for more details.

a career in STEM. So this chapter is not intended to give advice to institutions and businesses on practices that would support women in STEM. (There is a short bullet-point list of general suggestions.) Rather, it mainly lays out obstacles that young women in STEM might face. Among these are family obligations, historical roles (now she says we shouldn't be making the coffee …), young male colleagues' denial of discrimination, older colleagues' lack of respect for younger women colleagues, poor mentoring, and assumptions that women cannot meet the demands of a career while raising a family. Unfortunately, there are no specific suggestions for responding to these. In addition, the authors identify possible internal obstacles to women's advancement: lack of career focus or passion, or even an attitude of "waiting for someone to save you." The "practical tips and tricks" that comprise the end of the book are primarily about organizing one's life outside of work. They include the usual: get plenty of sleep and exercise, have a healthy diet, prioritize time with family and friends…. They don't mention the one thing that was most important to me in my career: have a partner who actually is a full partner in child-rearing, cooking and household tasks!

If you are a more senior person in your career, you might not find much benefit from this book. If you are starting your career, take a look. As you can tell from my review, it is more helpful for those of you going to industry or government jobs, but even for those of you in academia, it will help you think about how you approach the workplace and how you should think about the long trajectory of your career.

MEDIA COLUMN

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

The Codebreaker: Wife. Mother. Secret American Hero.

Antonia W. Bluher, National Security Agency

Disclaimer: The opinions expressed are those of the writer and not necessarily those of the NSA/CSS, the Department of Defense, or the United States Government.

Despite its short length of only one hour, this PBS documentary gives a surprisingly deep look at the life of a great pioneer in American cryptography, Elizebeth Smith Friedman. (The unorthodox spelling of her name was her mother's idea, in order to prevent her from ever being called Eliza.) Born in 1892 as the youngest of nine children in a Quaker family in the small town of Huntington, Indiana, her circumstance of birth did not present much likelihood of her becoming a major factor in American cryptography during two world wars. Her path was a product of her plucky personality, desire for intellectual adventure, and quirky circumstance. Along the way, she met and married William Friedman, her soulmate in life and in cryptographic pursuits. At the time of this writing, the film was available on the PBS website, pbs.org/americanexperience.

Elizebeth and William met at Riverbank, a 350-acre combination farm and think tank in Geneva, Illinois. Its owner, George Fabyan, was a retired textile merchant with extraordinary curiosity and trust in his instincts, and enough money to spend on whatever he fancied. This larger-than-life character collected scientists, one by one, to work for him. His thirst for knowledge and optimism were commendable, as he exhorted his researchers: "Achieve success! Be spectacular! Then things break your way!" On the other hand, his personality had a dark side; he was described as "a half-crazy individual of unlimited funds and a split personality" [1]. At one point he exerted control over William and Elizebeth's lives to the extent of screening their mail so that they would not see outside job offers. The paradox of Fabyan was that he was simultaneously the key that opened opportunity and brought the couple together, and the lock that dogged their existence for many years.

Fabyan's researchers worked on various investigations, some cutting-edge and others fantastical. One of the fantastical projects, to which Elizebeth was assigned, was to find hidden messages in works of Shakespeare, which had allegedly been planted into the text during the printing process by use of two distinct fonts that played the role of 0's and 1's in binary. Five letters of the manuscript, written in the two fonts, conveyed one letter of the hidden message. William also became involved in this project, his role being to make high-resolution photos of the manuscript. Elizebeth and William

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became disenchanted with the project, realizing that there was only one font, and that the variations in the lettering were due to inherent randomness and imperfections in the printing process. The decrypts had been achieved by "inspiration"—the ability that humans have to discern patterns that are not really there. Both Elizebeth and William seem to have had a "no BS gene," an endearing quality that is widely held by mathematicians and cryptographers.

Fortunately for them, they would soon be assigned to a much more meaningful pursuit. As World War I began, Fabyan offered the services of his Riverbank Laboratories to the US government for cryptography, and William and Elizebeth were put in charge. Despite having no experience, they learned on the fly and became a powerhouse of American cryptography. The US had a minuscule cryptographic effort at the time, so during the year 1917, William and Elizebeth became a primary source of US decrypts. They used known methods that could be found in books on military cryptography, such as frequency analysis, and also developed their own methods, often statistical and combinatorial. After 1917, the US military had built a small codebreaking program of its own and the operational pace at Riverbank slowed. At that point, Fabyan shifted focus, making Riverbank a training center for cryptography. During this period, the Friedmans focused on building the science, and their Cipher Department published eight pamphlets included in the *Riverbank Publications* [4]. These publications for the first time put math above linguistics as the primary tool for cryptography, and they served as de facto training manuals for cryptographers for the next several decades.

At Riverbank, William and Elizebeth worked as a team, and undoubtedly they would have loved to continue, but entering the "real world" changed that, as many opportunities were closed to women. William signed up for the Army, where he was deployed to work on cryptology in France in 1917–18, and Elizebeth, not being allowed to follow him there, remained at Riverbank.

By 1920, William and Elizebeth escaped from Fabyan's grip and set out for Washington, DC. William began a brilliant career with the Army Signals Intelligence Service, building a team that eventually became the basis for the National Security Agency. He became perhaps the most famous American cryptographer of all time. However, rather than fading away, Elizebeth ended up becoming a cryptographic giant in her own right. During the early 1920s, Elizebeth worked periodically, but also settled into raising a family, having two children in 1923 and 1926. However, the quiet life was not her destiny. Her skills were so rare and profound that they could not be overlooked. She was recruited by the Coast Guard (literally, knocking on her door) to decrypt messages from an organized crime syndicate of rumrunners during Prohibition. She reluctantly agreed, on condition that she could work from home. This might be one of the first instances of a power woman negotiating her work terms! She organized her household accordingly, making use of babysitting and house help—an early example of balancing work and family. In three months she read two years of back traffic for the Coast Guard. Some of the messages were simple, but others were very difficult indeed, based on layers of encryption on top of a code book. Her decrypts were a key point in bringing the crime ring to justice. At one point during the trial, the rumrunners' lawyers claimed that Elizebeth's decrypts were not scientific, and they could have been fabricated. Elizebeth requested and received a blackboard, and proceeded to conduct a cryptography lesson in the court room! She won the day. The newspapers made quite a sensation of it, and Elizebeth became instantly famous. She continued working with the Coast Guard for about two decades.

For the first several years with the Coast Guard, Elizebeth worked with the help of just one typist, but in 1931, she successfully lobbied to hire and train a team of seven people, which came to be considered as one of the Treasury's great assets. She was given a large raise and the title of CryptAnalyst in Charge. In 1940, her team pivoted from Prohibition work to listening to German and British ships in order to enforce neutrality. In this new work, they discovered the existence of a Nazi spy ring in South America, a pursuit which occupied the team throughout World War II and had great consequence.

In 1941, President Roosevelt signed an executive order moving the Coast Guard from the US Treasury to the Navy. The military did not want civilians to be in charge of sensitive functions, so a young lieutenant was appointed to lead the team that Elizebeth herself had formed and nurtured. Since women were not accepted into the military at that time, they were effectively blocked from most leadership positions. Despite her formal loss of the top leadership role, she remained the key member of the team. They decrypted messages from the Nazi spy ring in South America. The spy ring was telling the German navy the locations of American shipping vessels. Her decrypts enabled these ships to evade U-Boats and saved thousands of lives. Towards the end of the war, the spy ring switched to using the German Enigma machine, and she also managed to decrypt that traffic.

Her decrypts eventually were pivotal in swaying Brazil, Argentina, and Chile to the side of the Allies.

Although Elizebeth worked in the Navy as a civilian, it is interesting that the Navy had accepted some military women during World War I. This happened when the Secretary of the Navy, desperate to find code breakers at a time when so many men were at war, realized that nowhere in the Naval Reserve Act of 1916 did it say that yeomen had to be men [3, p. 74]. Several female yeomen were hired, the most prominent being Agnes Meyer, a brilliant cryptographer who ended up spending a forty-year career with the Navy. It is noteworthy that Elizebeth had applied to the Navy in 1917 and might also have been one of the yeomanettes, but for the fact that Fabyan was intercepting her mail. The period when the Navy accepted women into the military was short-lived—after World War I, Congress amended the reservist law to make sure it included the word "male." All the yeomanettes were discharged, though Agnes' abilities were so outstanding that she promptly got hired back as a civilian. The fact that women could serve only as civilians put a glass ceiling on their careers.

While Elizebeth's work during Prohibition was known to the public, her extraordinary impact during World War II was a well-kept secret. This information became available only after her death, when her work was declassified.

The movie is based on the biography *The Woman Who Smashed Codes* [1] by Jason Fagone, and the two pair well together. The movie provides a wealth of visual imagery, including photos and film footage from the time period. Meanwhile, the book provides rich detail both about individual characters and worldwide developments during a fascinating time period that spanned two world wars and included the establishment of the NSA and CIA. For people interested in getting an even better feel for who the Friedmans were, one can find primary sources online. These include the *Riverbank Publications* [4] that were written while William and Elizebeth worked for Fabyan, and a series of six lectures about cryptographic history that were presented by William Friedman in 1960, including a text version as well as an audio version in William's voice [5]. In retirement, the Friedmans coauthored the highly acclaimed and craftily written book *The Shakespearean Ciphers Examined* [2], considered the final word on debunking the theories of embedded messages in Shakespeare.

Also highly recommended for those who enjoy this genre is Liza Mundy's *New York Times* best-seller, *Code Girls* [3]. It is surprising to learn that in addition to William and Elizebeth, there is another high-profile code-smashing egalitarian couple, Parker and Genevieve Hitt. Like William, Parker enjoyed having a brilliant wife and was full of pride and encouragement. The Hitts sometimes intersected with the Friedmans—Parker and William concurrently served with the Army's American Expeditionary Force in France, and the Hitts visited Riverbank during the time that it functioned as a codebreaking school.

In summary, this short documentary is a must-see. It sends us back in time with historic footage from both world wars and gives a colorful portrait of the cast of characters. William and Elizebeth are remarkable as individuals, and even more so as a couple, with an egalitarian relationship and deep bonds. The formal workforce rules of the early 20th century were not ready for Elizebeth, but her talents were so deep that they could not be ignored, and she made an enormous impact as an improbable American heroine.

References

[1] Jason Fagone, *The Woman Who Smashed Codes: A True Story of Love, Spies, and the Unlikely Heroine who Outwitted America's Enemies*, Dey Street Books, 2017.

[2] William F. Friedman and Elizebeth S. Friedman, *The Shakespearean Ciphers Examined: An Analysis of Cryptographic Systems Used as Evidence that Some Author Other Than William Shakespeare Wrote the Plays Commonly Attributed to Him*, Cambridge, Cambridge University Press, 1957.

[3] Liza Mundy, *Code Girls: The Untold Story of the American Women Code Breakers of World War II*, Hachette Books, New York, Boston, 2017.

[4] *Riverbank Publications*, available at www.marshallfoundation.org.

[5] United States Cryptologic History, Sources in Cryptologic History Number 3, *The Friedman Legacy: A Tribute To William and Elizebeth Friedman*, can be found online by searching for friedman-legacy-transcript.pdf.

SIAM Annual Meeting to Be Virtual

The SIAM Annual Meeting will be held in virtual format, July 19–23, 2021. The program schedule and speaker index will be posted online in late May 2021. There will be a virtual AWM Workshop, and a graduate student poster session held in conjunction with the SIAM Poster Session. Vivette Girault will deliver the 2021 Sonia Kovalevsky lecture, "From linear poroelasticity to nonlinear implicit elastic and related models."

EDUCATION COLUMN

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

Revisiting: Student Evaluation of Teaching (SET)

Jackie Dewar, Professor Emerita of Mathematics, Loyola Marymount University, jdewar@lmu.edu

I first wrote about Student Evaluation of Teaching (though I called them Student Ratings of Teaching, the term preferred by many faculty developers) in the November/December 2008 newsletter.[1] My article sidestepped the fraught issues of validity, reliability, and bias in these instruments[2] to present guidelines that should be better known and observed when using the data gathered from SETs. The guidelines explained: (1) the need for an appropriate response rate, (2) that comparisons should only be made with similar courses, (3) how a below average rating can still be a good rating, (4) the necessity of using multiple measures to evaluate a complex activity like teaching, and more. For the full set of guidelines consult the article at the link in footnote 1.

I return to the topic of SETs now to discuss: (1) some recommendations for changing practices surrounding SETs given the disruption to the teaching/learning environment caused by COVID-19; and (2) two studies of SETs published in 2020 that offer new perspectives/data.

In April 2020, the MAA posted its Recommendations for COVID-19 Response that included the following:

> **Use course evaluations only to inform future planning, not as part of Faculty/TA files, evaluation, or tenure and promotion decisions.** In normal circumstances, the use of student course evaluations in tenure and other decisions is problematic because of their known biases. In a time impacted by a global pandemic, the use of these evaluations in faculty decisions would be unethical. The move to all virtual teaching and learning was abrupt and done without the consent of students or faculty, who had little time to prepare or adjust. Teaching work attempted at this time cannot be considered representative. If course evaluations from this time are to be used at all, it should be to help faculty reflect on their work during this difficult time. They should not be saved by the institution or made available in any form for future formal evaluation.[3]

In August 2020, the Liberal Education blog of AACU (Association of American Colleges and Universities) observed:

> In this current environment, institutions must seriously reconsider the continued administration of a formal student evaluation of teaching and its use for promotion and tenure decisions.[4]

Inside Higher Ed (*IHE*) published two articles on SETs last year that I want to share. The first article (February 27, 2020) concerned a study based on a computational simulation, not actual student evaluation data.[5] The researchers simulated SET scores and faculty quality percentiles with varying correlation. They then used the simulated scores to make: (a) pairwise comparisons between individual instructors; and (b) comparisons of an individual's scores to the overall distribution of scores from all the instructors. These comparisons were intended to mirror typical use of SETs for (a) comparing two job candidates' teaching performances, or comparing the teaching of a faculty member up for tenure to that of a recent (un)successful case; and (b) for identifying faculty members who are underperforming relative to their peers, respectively (Esarey and Valdez, 2020, p. 1107).

The underlying assumptions of their model were that student ratings are moderately correlated with student learning, highly reliable, and not biased relative to gender, class size, or the type of course. Even under these ideal circumstances, the computer simulation showed that SETs do not reliably identify the best teacher in a pairwise comparison. In the simulation, SETs also failed at identifying the worst and the best teachers.[6] The problem is that despite using roughly the best estimate of reliability (that is correlation

[1] See pp. 21–23 of https://www.drivehq.com/folder/p8755087/1751135045.aspx

[2] See, for example, https://www.sciencedirect.com/science/article/abs/pii/S0191491X16300323 and https://www.scienceopen.com/document/read?vid=818d8ec0-5908-47d8-86b4-5dc38f04b23e

[3] https://www.mathvalues.org/masterblog/maa-recommendations-covid-19-response

[4] https://www.aacu.org/blog/student-evaluation-teaching-covid-19-considerations-validity-and-fairness

[5] https://www.insidehighered.com/news/2020/02/27/study-student-evaluations-teaching-are-deeply-flawed

[6] In the simulation 25% percent of faculty with SET scores below the 20th percentile were actually better teachers than the median professor and nearly 19% of those with SET scores above the 95th percentile were no better than the median.

between SETs and instructor quality) ever supported by the literature, the resulting variability is too great. This results from "the considerable imprecision in the relationship between SET scores and instructor quality even when there is substantial correlation between the two" (Esarey and Valdez, 2020, p. 1107).

The second *IHE* article (November 2, 2020) reported on a study of gender bias in TA (teaching assistant) evaluations as opposed to faculty evaluations.[7] Khazan, Borden, Johnson, and Greenhaw (2020) was limited in scope and took place in a single online upper division natural resource ecology course in Fall 2019. All 136 students had the same TA (a woman), but half were led to believe the TA was male and the other half female. While the difference in the mean scores obtained from 115 respondents was not significant, the purportedly female TA received five times as many overall negative assessments, and 80% of those came from female students. The study's authors observed that negative SET ratings and comments can have a demoralizing effect on the recipient, limit future award or job opportunities, and potentially contribute to leaving the profession. With so many mathematics courses going online these days, perhaps this study could be tried in our discipline.

[7] https://www.insidehighered.com/news/2020/11/02/study-finds-gender-bias-ta-evals-too?utm_source=Inside+Higher+Ed&utm_campaign=50ab8ee656-DNU_2020_COPY_02&utm_medium=email&utm_term=0_1fcbc04421-50ab8ee656-197440497&mc_cid=50ab8ee656&mc_eid =2c8b5acac0

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E. Khazan, E., Borden, J., Johnson, S., & Greenhaw, L. (2020). Examining Gender Bias in Student Evaluations of Teaching for Graduate Teaching Assistants. *North American Colleges and Teachers of Agriculture Journal*, 64. Available at https://www.nactateachers.org/index.php/volume-64-november-2019-october-2020

Editor's Note: Erica Walker, who usually writes the Education column for the May–June issue, will instead contribute to the November–December issue this year.

CALL FOR NOMINATIONS

The Association for Women in Mathematics Student Chapter Awards

In September 2016, the Executive Committee of the Association for Women in Mathematics established the Student Chapter Awards, to be awarded annually at the MAA MathFest. The purpose of these awards is to recognize outstanding achievements in chapter activities among the AWM student chapters.

Awards will be given out in up to four categories: (1) scientific excellence, (2) outreach, (3) professional development, and (4) funding/sustainability. More details about each category can be found on the AWM website awm-math.org.

Any chapter may nominate itself for awards. The nomination should include: 1) A cover letter: The cover letter should summarize the chapter's qualifications for the award category to which it is nominating itself. If the chapter is applying in two categories, it should ensure that both categories are clearly included in one cover letter. 2) An activities report: The activities report, 500–1000 words in length, should give a detailed description of the particular work for which it is seeking an award. If the chapter is applying in two categories, a separate activities report is required for each. Nomination materials should be submitted online at MathPrograms.org. The submission link will be available 45 days prior to the nomination deadline. Nominations must be received by **May 15, 2021**. If you have questions, phone 401-455-4042, email awm@awm-math.org, or visit https://awm-math.org/awards/awm-student-chapter-awards/.

2021 Awards and Prizes

Congratulations to those cited below for their awards from organizations other than AWM! They would have been presented at the 2021 JMM had it not been converted to a virtual meeting, at which the usual Joint Prize Session was not held. The extracts below are reprinted in the order in which they appear in the Prize and Awards Booklet, which is available online without its usual cover (see https://blogs.ams.org/beyondreviews/2021/01/03/jmm-prizes-and-awards-2021/). For full citations, descriptions of the prizes, biographical data and responses, visit the web.

Deborah and Franklin Tepper Haimo Distinguished Teaching Awards (MAA)

Elaine Kasimatis, California State University, Sacramento

Elaine Kasimatis has a long and exemplary record of accomplishments that attest to her devotion to teaching and student learning. She is the rare mathematician who holds a PhD in pure mathematics as well as an MA in mathematics teaching and a teaching credential. Elaine is recognized as a thoughtful and inspiring teacher and a deeply caring mentor whose support builds her students' penchant for persevering to make sense of the mathematics they are exploring. Her broad and deep work through regional, state, and national efforts has profoundly influenced not only students, but also generations of mathematics teachers and, in turn, their students.

Early in her career, Elaine recognized the need for programs to better support future teachers of mathematics. She developed a course to engage future elementary school teachers in genuine mathematical processes—exploration, conjecture, and proof. The course has influenced thousands of teachers as well as the dozens of mathematics faculty members who have taught the course over the past 30 years. Elaine developed a capstone course connecting real analysis and abstract algebra content to high school curricula, revamped the university's curriculum for remedial mathematics, created professional development programs for faculty teaching remedial mathematics, and developed a course to train tutors, among other projects. Much of this work has now appeared in more widely distributed programs and curricula, and in every case, Elaine was years ahead of the trends to create such programs. Elaine played a major role in developing the first program in California to integrate mathematics content with teacher preparation. Since the program's inception in 2001, she has carefully mentored and supervised every student teacher. Teachers from the program are in high demand regionally because of their exceptional preparation. Many teach in communities with large numbers of students from historically underserved groups. Her direct support of K–12 teachers also extends beyond their college and university experience, as she developed the California Math Project, a home for K–12 teachers of mathematics that, for over two decades, has enhanced the professional lives of thousands of teachers.

Elaine has been similarly influential beyond northern California. Her work on the NSF-funded Access to Algebra program increased the success of middle school students in Algebra 1 classes around the country. She is well-known for co-creating College Preparatory Mathematics, an innovative high school and middle school mathematics curriculum now used nationally and internationally. In 1999, it was designated one of three Exemplary Mathematics Programs by the US Department of Education. Elaine's international efforts include her work to create a new school in Rwanda and to develop the teacher preparation program there.

Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service (MAA)

Deanna Haunsperger, Carleton College

The Gung and Hu Award Committee recommends that the 2021 award go to Deanna Haunsperger for her prolific service to mathematics, including with the Mathematical Association of America; for her influential leadership of women in mathematics; for her long focus on inclusion and on building inclusive mathematical communities; and for a laudable career that has been rich in mathematical research, mathematical education, and mathematical exposition.

There are many ways one might influence the course of our discipline in Gung Hu-worthy ways. The main theme of Deanna's way is inclusion, in the sense of working to make learning and doing mathematics, from elementary to advanced levels, interesting and viable for many and various people. Deanna's deep interest in welcoming and helping a broad range of students to the study of mathematics is clear and evident. Both the goal of building a mathematical community and Deanna's efforts to this end are about as thoroughly MAA-centered as one could imagine. Deanna Haunsperger was MAA president (2017–2018) and is a professor of mathematics at Carleton College, where she has

been teaching for over twenty-five years. She earned her BA in mathematics and computer science from Simpson College and her PhD in mathematics from Northwestern University, focusing on voting theory applications to decision making.

As a faculty member at Carleton College, co-editor of *Math Horizons*, co-founder and co-director of the NSF-funded Summer Mathematics Program for Women Undergraduates (SMP), the second vice president and president of the MAA, chair of the Strategic Planning Group on Students, chair of the Council on Outreach Programs, co-chair of the Centennial Planning Committee, a member of many more MAA committees, and a member of the mathematics community as a whole, Deanna has done a tremendous job of encouraging, mentoring, and envisioning programs to help undergraduates pursue graduate study and careers in the mathematical sciences.

Carleton's SMP was recognized by the AMS as a 2014 Program That Makes a Difference. As the co-founders and co-directors from 1995 through 2014, Deanna and fellow mathematician and husband Stephen Kennedy created a community of several hundred female mathematicians who support, encourage, and inspire one another, and who mentor younger women who are thinking of going into mathematics. The impact of this group of female mathematicians can be felt throughout the country. The community of women built by this program, whose members started as undergraduates, now boasts over 110 PhDs in mathematics or a mathematical science, with over 30 members currently in graduate school in mathematics. These women will invariably tell you how grateful they were to SMP and Deanna and Stephen for helping them get where they are now in mathematics.

In addition to the leadership and mentoring that Deanna and Stephen provided to students during SMP, they have continued to foster the community of former SMPers long after the NSF stopped funding summer programs for women. Every year, they organize an SMP reunion at the Joint Mathematics Meetings, which now brings together approximately 40–50 alumnae at various stages in their mathematical careers. While SMP still had some NSF funding, they would help organize a JMM workshop, the Graduate Education Mentoring Workshop (GEM), to offer continued mentoring and networking for former SMPers who were pursuing graduate studies. This workshop was run by former SMPers who had tenure-track jobs themselves, but Deanna and Stephen's ideas, enthusiasm, and encouragement would be felt every step of the way.

Deanna was recognized in 2012 by the AWM with the M. Gweneth Humphreys Award for Mentorship of Undergraduate Women in Mathematics. She won, with Stephen Kennedy, the MAA Meritorious Service Award in 2016. She is also on the Board of Directors of Pro Mathematica Arte, which oversees the Budapest Semesters in Mathematics, and she was co-chair of the Human Resources Advisory Committee of the Mathematical Sciences Research Institute.

Deanna co-edited the books *The Edge of the Universe* and *A Century of Advancing Mathematics* and is working on a new book on mathematical communities. Deanna's co-editorship of the fourth edition of the MAA's popular *101 Careers in Mathematics* is yet another example of Deanna's MAA-related community effort. This one nicely combines Deanna's editorial skills with an explicitly broad outreach mission: to encourage students and other young mathematicians to see mathematical careers as possible and viable for themselves. The 125 people featured in this edition are notably diverse in every sense of the word.

As MAA president and past-president, Deanna helped launch a new MAA award and then served as the first chair of the Committee on the Inclusivity Prize. And if that were not enough, she and Stephen financially support the MAA and are members of the MAA Icosahedron Society.

As an association, MAA is stronger and a model for others because of Deanna Haunsperger's insistence that we be fair, inclusive, and welcoming, which has expanded our community with mathematicians who respect and include all. This is distinguished service from which the MAA and the profession will long benefit.

JPBM Communications Awards

John Bailer, Richard Campbell, and Rosemary Pennington

The 2021 JPBM Communications Award is presented to John Bailer, Richard Campbell, and Rosemary Pennington for their engaging, entertaining, and enlightening *Stats+Stories* podcast that for over six years has brought "the statistics behind the stories and the stories behind the statistics" to public radio and a broad podcast audience.

Biographical Note: Rosemary Pennington is an assistant professor of journalism in Miami University's Department of Media, Journalism & Film. Her research focuses on media representations of marginalized groups, with a specific focus on the representations of Muslims. She is the co-editor of the books *The Media World of ISIS* and *On Islam: Muslims and the Media* from Indiana University Press. Pennington received her PhD in mass communication from Indiana University in 2015. In her pre-academic life, she worked as a broadcast

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journalist in the newsrooms of public broadcasters WOUB and WBHM. While working at WBHM, Pennington's science and medical reporting helped her win the Alabama Associated Press's Best Specialized Reporter award two years in a row and the Douglas L. Cannon Broadcast Award for Excellence in Medical Reporting three years in a row.

Erica Klarreich

The 2021 JPBM Communications Award is presented to Erica Klarreich for her work as a writer and popularizer of mathematics and science. She writes about mathematics and theoretical computer science, and her writing has been chosen for and reprinted in *Best Writing on Mathematics* in four different years. Her works have appeared in *Quanta*, *The Atlantic*, *New Scientist*, *Science News*, *Wired* and other publications for a general audience. Erica Klarreich received a PhD in mathematics in 1997.

Biographical Note: Erica Klarreich has been writing about mathematics and science for a popular audience for more than twenty years. She has a PhD in mathematics from Stony Brook University and was a postdoc at the University of Michigan for three years. She is a graduate of the science communication program at the University of California, Santa Cruz.

As a freelance journalist based in Berkeley, California, she has written hundreds of articles for a wide range of publications.…

She was the journalist in residence at the Mathematical Sciences Research Institute in Berkeley in 2002 and at the Simons Institute for the Theory of Computing at the University of California, Berkeley in 2016. She has appeared on the *Numberphile* YouTube series and was the narrator for two mathematics documentaries by ZALA Films: *Secrets of the Surface*, about the life and work of Maryam Mirzakhani, and *Counting from Infinity*, about Yitang Zhang's work on the twin primes conjecture.

AMS Mary P. Dolciani Prize for Excellence in Research

Amanda L. Folsom, Amherst College

The Mary P. Dolciani Prize for Excellence in Research is awarded to Amanda L. Folsom, Professor of Mathematics at Amherst College, for her outstanding record of research in analytic and algebraic number theory, with applications to combinatorics and Lie theory, for her work with undergraduate students and for her service to the profession, including her work to promote success of women in mathematics.

Folsom received her PhD in mathematics in 2006 from the University of California at Los Angeles under the supervision of William Duke. She has published over 40 research articles on different aspects of the theory of modular forms, most notably on harmonic Maass forms, mock modular forms, and quantum modular and Jacobi forms. These papers have appeared in some of the most important international journals in number theory, including *Compositio Mathematica*, *Acta Arithmetica*, *Crelle's Journal*, and the *Journal of Number Theory*. Her book *Harmonic Maass Forms and Mock Modular Forms: Theory and Applications*, written with Kathrin Bringmann, Ken Ono, and Larry Rolen, won the PROSE Award from the Association of American Publishers as the Best Scholarly Book in Mathematics of 2018. She serves on the Editorial Boards of the *Proceedings of the American Mathematical Society*, the *Journal of Number Theory*, and *Research in Number Theory*. She has twice been a von Neumann Fellow at the Institute for Advanced Study in Princeton and has received a Simons Fellowship and multiple NSF individual investigator awards, including a CAREER award.

Folsom's research centers around the theory of mock modular forms and their relatives. Classical modular forms are complex functions on the upper half plane that have an invariance property under the action of the modular group; it was a profound study of their relationship to number theory that led to the proof of Fermat's Last Theorem. Mock modular forms have their roots in the work of Ramanujan, who proposed a number of functions that were "almost" invariant like a "real" modular form, but not quite. While Ramanujan didn't formally define "mock modular forms," over the past few decades, the work of many mathematicians has clarified the relationship of mock modular forms to more classical objects while at the same time generalizing them and highlighting the important combinatorial implications of the theory. Folsom has played a key role in this program, showing, with a variety of collaborators, how the theory of mock modular forms and their generalizations yields insights in situations as diverse as the representation theory of vertex algebras and Lie superalgebras, convex geometry, and a variety of combinatorial problems such as counting unimodal sequences of integers.

Folsom is an active collaborator with undergraduates, successfully bringing students into her research field, and has coauthored five papers with thirteen undergraduate coauthors. Folsom is also a dedicated expositor, working to explain her research field as well as aspects of the mathematical profession to a more general audience through articles in

journals such as the *Notices of the American Mathematical Society* and *Philosophical Transactions of the Royal Society A*. She has twice been a research advisor and co-edited a volume for the Women in Numbers workshops at Banff. [Ed. Note: The volume appears in the Springer AWM Series.] She currently serves as Department Chair of Mathematics and Statistics at Amherst.

Albert Leon Whiteman Memorial Prize (AMS)

Judith Victor Grabiner

The 2021 Albert Leon Whiteman Memorial Prize is awarded to Judith Grabiner for her outstanding contributions to the history of mathematics, in particular her works on Cauchy, Lagrange, and MacLaurin; her widely-recognized gift for expository writing; and a distinguished career of teaching, lecturing, and numerous publications promoting a better understanding of mathematics and the significant roles it plays in culture generally.

Biographical Note: Judith Victor Grabiner received her BS in Mathematics in 1960 at the University of Chicago, where she discovered that history, philosophy, and literature could be just as interesting and intellectually challenging as science. A chance look at a Harvard catalogue revealed the existence of an interdisciplinary field called History of Science, so she decided to study it. She received her MA in 1962 from Radcliffe and PhD in the History of Science in 1966 from Harvard, with thesis advisors I. Bernard Cohen and Dirk Struik. Her thesis was the beginning of her research program on eighteenth-century analysis. She focused on the use of algebraic inequalities in bounding approximations that revealed the key properties of the derivative, especially in the mean-value theorem, the theory of maxima and minima, power series, and the fundamental theorem of calculus.

After one-year jobs at UC Santa Barbara and Cal State LA, she became a professor of history at California State University, Dominguez Hills, where she received the Outstanding Professor award in 1975. She was co-president of the West Coast History of Science Society (1973–1975), Book Review Editor of *Historia Mathematica* (1976–1988), and Chair of the Southern California Section of the MAA (1982–1983). In 1985 she joined the mathematics faculty at Pitzer College in Claremont, California, where she held the Flora Sanborn Pitzer Chair in Mathematics until retiring in 2016. She has been a Visiting Scholar at the University of Leeds, the University of Edinburgh, Cambridge University, the Australian National University, and the University of Copenhagen. In 2013 she became a Fellow of the American Mathematical Society.

Grabiner's publications include three books: *The Origins of Cauchy's Rigorous Calculus*, 1981; *The Calculus as Algebra*, 1990; and *A Historian Looks Back: The Calculus as Algebra and Selected Writings*, 2010, which won the Beckenbach Book Prize from the MAA in 2014. She has also published over forty refereed articles….

She has given invited talks about her work in many international and national meetings and has been both a Sigma Xi National Lecturer and an MAA Distinguished Lecturer. She is also the author of a highly-rated course, "Mathematics, Philosophy, and the 'Real World,' " in the Teaching Company's Great Courses series. And she received the national Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching from the MAA in 2003.

Since retiring, she has been tutoring at-risk elementary school students in mathematics, working in voter outreach, still doing research though at a slower pace, and reading far too many detective novels than is good for her.

The Ruth Lyttle Satter Prize (AMS)

Kaisa Matomäki

The 2021 Ruth Lyttle Satter Prize is awarded to Kaisa Matomäki for her work (much of it joint with Maksym Radziwiłł) opening up the field of multiplicative functions in short intervals in a completely unexpected and very fruitful way, and in particular in their breakthrough paper, "Multiplicative functions in short intervals," (*Annals of Math*. 183 (2016), 1015–1056).

The Möbius function μ is a function from positive integers to $\{0, \pm 1\}$ which sends n to $(-1)^k$ where k is the number of prime factors of n if n is square free, and to 0 otherwise. It is a basic example of a multiplicative function, i.e., a function f on the positive integers satisfying $f(ab) = f(a)f(b)$ whenever a and b are coprime. The Möbius function is intimately connected to the Riemann zeta function and to the distribution of prime numbers. For example the prime number theorem (giving the asymptotic distribution of prime numbers) is equivalent to the non-vanishing of the Riemann zeta function on the line $\mathrm{Re}(s) = 1$ which in turn is equivalent to the fact that the Möbius function asymptotically has mean zero on intervals of the form $[x, 2x]$. It is important to understand whether this mean zero behavior remains true on shorter intervals $[x\ ,\ x + h(x)]$, even for "most x." In their 2016

continued on page 26

paper, described as a "stunning surprise" going well beyond what was commonly thought to be currently possible, Matomäki and Radziwiłł showed that for most x this was true as long as $h(x)$ grew with x, however slowly. (Moreover they proved a general result that holds for any real-valued bounded multiplicative function, not only for the Möbius function.) Previously, even assuming the Riemann hypothesis, such a result was only known for h growing like a power of $\log x$. Their result has had a transformative effect on analytic number theory opening up new lines of research and leading for instance to important progress on the Chowla conjecture and to Tao's resolution of the Erdös discrepancy problem.

MAA MathFest Goes Virtual!

Join the MAA for a highly engaging and interactive virtual meeting August 4–7, 2021. The program, registration info, and so on should be available at www.maa.org soon. The lineup of invited lectures is already posted and looks quite interesting. Bonita V. Saunders will deliver the AWM-MAA Etta Zuber Falconer Lecture, "Complex Functions, Mesh Generation, and *Hidden Figures* in the NIST Digital Library of Mathematical Functions." The inaugural Christine Darden Lecture, "The Road to 2002 Sonic Boom Demonstration," will be given by *Hidden Figure* Darden herself.

Ruth I. Michler Prize

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

A $50,000 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 October 1 for the award to be used during the 2022–2023 academic year.

www.awm-math.org/michlerprize.html

Cornell University

AWM ASSOCIATION FOR WOMEN IN MATHEMATICS

NSF-AWM Travel Grants for Women

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

Selection Procedure. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM. A maximum of $2300 for domestic travel and of $3500 for foreign travel will be funded. For foreign travel, US air carriers must be used (exceptions only per federal grants regulations; prior AWM approval required).

Eligibility and Applications. Please see the website (https://awm-math.org/awm-grants/travel-grants/) for details on eligibility and do not hesitate to contact awm@awm-math.org or 401-455-4042 for guidance. Applications from members of underrepresented minorities are especially welcome.

Deadlines. There are three award periods per year. Applications are due **February 1**, **May 15**, and **October 1**.

AWM WORKSHOP AT THE 2022 JOINT MATHEMATICS MEETINGS

Application deadline for graduate student poster session: **August 15, 2021**

For many years, the Association for Women in Mathematics has held a series of workshops in conjunction with major mathematics meetings. The AWM Workshops serve as follow-up workshops to Research Collaboration Conferences for Women (RCCW), featuring both junior and senior speakers from one of the AWM Research Networks. An AWM Workshop will be held in conjunction with the Joint Mathematics Meetings in Seattle, WA, January 5 – 8, 2022.

FORMAT: The workshop will consist of a Special Session focused on Algebraic Geometry organized by Julie Rana and Isabel Vogt, and a Poster Session for graduate students and recent PhDs. The Special Session will feature selected junior and senior mathematicians from the Research Network Women in Algebraic Geometry (WiAG). This workshop follows the RCCW hosted by ICERM in July of 2020.

POSTER SESSION: The Poster Session is open to all areas of research; graduate students working in areas related to algebraic geometry are especially encouraged to apply. Poster presenters will be selected through an application process to present posters at the Workshop Reception & Poster Session. With funding from NSF, AWM will offer partial support for travel and hotel accommodations for the selected graduate students. The workshop will include a reception, luncheon and a mentoring session where workshop participants will have the opportunity to meet with other women and non-binary mathematicians at all stages of their careers. In particular, graduate students in algebraic geometry will have the opportunity to connect with the Women in Algebraic Geometry (WiAG) Research Network.

ELIGIBILITY: To be eligible for selection and funding, a graduate student must have made substantial progress towards their thesis. Women and non-binary mathematicians with grants or other sources of support are welcome to apply.

All applications should be submitted on mathprograms.org and include:

- a title of the proposed poster
- an abstract in the form required for AMS Special Session submissions for the Joint Mathematics Meetings
- a curriculum vitae
- one letter of recommendation from the applicant's thesis advisor.

Applications (including abstract submission via the Joint Mathematics Meetings website) must be completed electronically by **August 15, 2021**. See https://awm-math.org/meetings/awm-jmm/ for details.

MENTORS: We also seek volunteers to act as mentors for graduate students as part of the workshop. If you are interested in volunteering, please contact the AWM office at awm@awm-math.org by **September 15, 2021**.

Mathematicians of all genders are invited to attend the talks and poster presentations. Departments are urged to help graduate students and junior faculty who are not selected for the workshop to obtain institutional support to attend the presentations.

AWM Thank-Yous

AWM is grateful to those whose donations support its mission of encouraging women and girls to study mathematics and have careers in the mathematical sciences. We extend a special thank you to AWM contributing members and donors. We also thank those who prefer to remain anonymous. (This list reflects activity from July 1, 2019–June 30, 2020.)

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