

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.

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## PRESIDENT'S REPORT

By now it is obvious that our old lives are not returning anytime soon. For a mathematician, being holed up alone can be a great opportunity for good research. But even for the most head-in-theorems mathematicians, the underlying stress of these times is wearing. According to the CDC 40% of Americans were struggling with mental health or substance abuse in June—two to three times higher than normal (<https://www.cdc.gov/mmwr/volumes/69/wr/mm6932a1.htm>). So you are not alone (well, you are socially distanced, but you know what I mean). I ask of you two things in this extraordinary time: give yourself permission to not be quite the superwomen you usually are, and give others a little extra slack, too.

Actually, I hope we can do both of these things now and in the future, beyond pandemics, climate calamities, glaring racism, and deep political and social divides. It is hard to always get it right, so I hope we will assume the best of ourselves and of each other. That means understanding that people we love may do things we do not like, but we still love them. And it means when people we don't know do something we find problematic, we should not assume they are bad people. Stuck in our isolated locations it is easier than ever to see only one facet of a person or situation.

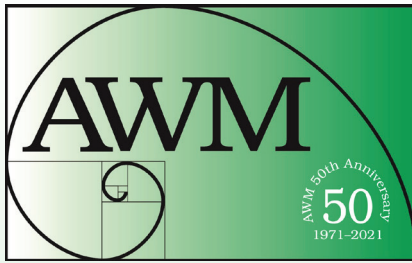
It is important to help make the world a better place, critical to be an active ally and not a complicit bystander, but let us encourage right action and try to believe in basic human goodness rather than condemning individuals or institutions. And yes, I know this feels extra hard right now.

The AWM has as its mission to encourage and support all women, from all backgrounds, in all kinds of mathematics, at all educational and career stages. It is sometimes clearer to see where we come up short (not enough programs for math educators, not enough diversity in leadership, why does it say women and not a more gender inclusive term?) than what we've achieved. I hope you will continue to assume the best of AWM and be an active participant to help us become even better.

Our community of women in mathematics is diverse along so many axes. I hope each of us will value all of us. We see women in math choosing a wide variety of career paths, engaging in a wide variety of research or focusing on educating, or serving the community in other ways. We choose to teach, be tenure track, work for the military, open restaurants, be administrators, write novels, you name it. Every woman, every gender-expanding person doing math is remarkable. Please join me in appreciating all of us.

The Joint Math Meetings will be a virtual conference in 2021, and the AWM will be there! It was to be, and will be, the kick off to the celebration of the 50th

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## ASSOCIATION FOR WOMEN IN MATHEMATICS

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

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

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

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## PRESIDENT'S REPORT *continued from page 1*

anniversary of the AWM. After all, as the story goes, the AWM started when a small group of women stuck around after a meeting of the Mathematics Action Group at the 1971 JMM in Atlanta and formed a caucus. Around the same time one of the women, Mary Gray, sat in on an AMS council meeting—where women were not welcome. For more about the early history see Lenore Blum's piece written for our 20th anniversary: <https://awm-math.org/about/history/a-brief-history-of-awm/>.

Our 2021 JMM activities will include a wide range of activities, reflecting many aspects (but alas not all) of who we are. Our feature events this year are panels: To help all of us think about ethical implications of what we do, there will be an AWM panel on Fairness and Bias (Thursday). For a great look back at our history, there will be a panel discussion entitled "AWM through the decades," featuring AWM presidents from each decade (Thursday). A third panel discussion on Non-Traditional Careers in Mathematics is also planned. This year's workshop for young researchers is organized by Women in Analysis (WoAN). Please stop by the poster session Friday to admire the research of the new crop of women graduate students. Other sessions co-sponsored by AWM include the AMS-AWM Special Session on Women of Color in Applied Math and Analysis; the AMS-AWM Special Session on Women of Color in Topology and Algebra; and the MAA Contributed Paper Session on Promoting Women in Mathematics (co-sponsored by AWM and other groups). We'll also be posting videos to celebrate this year's various prize winners, as there will be no prize session at the virtual JMM.

I am delighted to report the University of Waterloo has become the inaugural AWM Sponsoring Institution. Thank you Waterloo! With an entire Faculty of Mathematics, consisting of 6 departments and 260 full time faculty, they are surely one of the largest groups of mathematicians in the world. We were happy to create a new membership category for them, and hope other institutions (even those with fewer members) will be interested in sponsoring AWM in a similar manner as well. Please reach out to us if you are interested in learning more.

A great big thank you to everyone who has continued to contribute to AWM during this multifaceted crisis. Thanks too for simply renewing your membership or joining us for the first time. The majority of our budget comes from our members and we are grateful for your continued support.

As always, I look forward to hearing your thoughts and working with our community.

Ruth Haas  
September 24, 2020  
Mānoa, HI



Ruth Haas

## PRESIDENTS' REFLECTIONS

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

This is the twelfth 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.

Jean Taylor was the fourteenth president of AWM (1999–2001). For more about Taylor, see her Wikipedia entry and web pages: <http://cims.nyu.edu/~jtaylor>, <http://sites.math.rutgers.edu/~jet1>.

## A Blast from the Past and a Hope for the Future

*Jean E. Taylor*

My first priority for the AWM [will be] to be sure its finances, office staff and governing procedures are in good order. We need to ensure continued grant support for the many things we do well. Then I’d like to see the AWM grow both in financial resources and adventurousness. In particular, I’d like to see the AWM become a more active source of information and projects concerning all women in mathematics, including women in industry and girls in school.

That is in a message I sent in July 1998 to the AWM president Sylvia Wiegand, as part of a correspondence about priorities and goals for AWM. We made progress on most of these goals, both under Sylvia’s leadership and then under mine.

My most enduring innovation has been the great AWM website. Before, the AWM web presence had been as a subdirectory of the president’s own website, moving around every two years as the president changed. (I’m afraid I’m responsible for the name [awm-math.org](http://awm-math.org); when we tried to register [AWM.org](http://AWM.org), we found that address already taken.) A former undergraduate student of mine, Barbara Ling, got it off the ground, and then it soared under Tamara Kolda’s direction. It rapidly became what I wished for: an active source of information.

Another innovation was developing a proposal to expand our NSF-funded travel grants program to include mentoring travel grants. This idea had been proposed before my time, but it was up to me to develop it into an NSF proposal and see it through (of course, with lots of other people’s work!). It has been valuable to many women since.

As an indication of the state of our governing procedures, the AWM clerk was not attending meetings of the executive committee (EC), but rather mainly serving as the AWM representative legally required by our charter in Massachusetts. Thus things like the taking of minutes were rather haphazard. I appointed Sue Geller as clerk, and that changed. At that time, nearly all of AWM’s basic work was done by the president plus three people: long-standing volunteers Anne Leggett and Bettye Anne Case, running the newsletter and meetings respectively, and our paid office

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### Membership Dues

*Membership runs from Oct. 1 to Sept. 30*

**Individual:** \$70 **Contributing:** \$160

**Family, new member, and reciprocal (first two years):** \$35

**Affiliate, retired, part-time:** \$30

**Student, unemployed:** \$20

**Outreach:** \$10

*AWM is a 501(c)(3) organization.*

### Institutional Membership Levels

**Category 1:** \$325

**Category 2:** \$325

**Category 3:** \$200

See [awm-math.org](http://awm-math.org) for details on free ads, free student memberships, and ad discounts.

### Executive Sponsorship Levels

\$5000+

\$2500–\$4999

\$1000–\$2499

### Print Subscriptions and Back Orders—

Regular and contributing members living in the US may elect to receive a print version of the *Newsletter*. Libraries, women’s studies centers, non-mathematics departments, etc., may purchase a subscription for \$75/year. Back orders are \$20/issue plus shipping/handling (\$5 minimum).

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

**Newsletter Ads**—AWM will accept ads for the *Newsletter* for positions available, programs in any of the mathematical sciences, professional activities and opportunities of interest to the AWM membership, and other appropriate subjects. The Administrative Specialist, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the Newsletter must be Affirmative Action/Equal Opportunity designated.* Institutional members receive discounts on ads; see the AWM website for details. For non-members, the rate is \$130 for a basic four-line ad. Additional lines are \$16 each. See the AWM website for *Newsletter* display ad rates.

### Newsletter Deadlines

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

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

### Addresses

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



## ASSOCIATION FOR WOMEN IN MATHEMATICS

### AWM ONLINE

The *AWM Newsletter* is freely available online.

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

**Website:** <https://awm-math.org>  
Updates: [webmaster@awm-math.org](mailto:webmaster@awm-math.org)

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### AWM DEADLINES

AWM Workshop at SIAM:  
November 15, 2020  
AWM Research Symposium Proposals:  
November 15, 2020  
AWM Essay Contest: February 1, 2021  
AWM Mentoring Travel Grants:  
February 1, 2021  
AWM-Microsoft Research Prize:  
February 1, 2021  
AWM-Sadosky Research Prize:  
February 1, 2021  
AWM Travel Grants: February 1  
and May 15, 2021  
RCCW Proposals: February 1, 2021

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## PRESIDENTS' REFLECTIONS *continued from page 3*

manager, Dawn Wheeler. AWM relied entirely on those three. But Dawn was sufficiently busy and set in her ways that it was difficult to make any changes in how the office functioned, even to the updating of software. Furthermore, the rest of the EC (beyond Anne and Bettye Anne) was underutilized. I got another staff person hired and made various attempts to have the EC become more involved but it was only under later presidents, most notably Carolyn Gordon, that I saw the EC blossom and the management become more flexible. I learned valuable lessons in leadership by watching her. Financial resources did grow, but never as much as we could have used.

One effort at outreach that I made was having AWM Scholars at AAAS annual meetings. Students applied; six were accepted and got free registration and press passes. I arranged for them to have shared hotel rooms and provided rudimentary breakfast and guidance to the meeting. Many of them got additional travel funds from their colleges or universities. They all wrote articles about their experience.<sup>1</sup> (Although both the students and I enjoyed this, and they enlivened some of the discussions, this program was not continued after my presidency.) Other innovations of my time as AWM president: getting job advertisements onto the website (yes, there was debate on the EC about this!), having a Corporate Task Force, and sponsoring a membership drive. I participated in an International Congress of Industrial and Applied Mathematicians (with its AWM workshop) in Edinburgh and the Pan-African Congress of Mathematicians in Cape Town, as well as multiple meetings in the US.

As always, we relied on volunteers to organize and serve on all our committees, especially including the selection committees working behind the scenes to make travel grants, lectures, prizes, panels, conferences, Sonia Kovalevsky Days, etc. happen—I counted nearly 100 people by the end of my presidency.

For the past almost 50 years, people have asked “Is AWM (still) necessary?” I answer with a resounding yes! AWM was founded in 1971; to see what the situation for women was like then, see the film *On the Basis of Sex*. After describing Ruth Bader Ginsburg’s law school student days at Harvard and Columbia and her inability to get a position in a law firm despite being at the top of her class, the film focused on the first case the Ginsburgs argued in court together, a gender-discrimination dispute brought before the US Court of Appeals in 1971. As for me, in 1971, I was in the midst of my PhD thesis work, unaware of what RBG was accomplishing for all of us and not present at the founding of AWM, though I was activist enough to be part of the Mathematics Action Group at Princeton. (The next year I became part of the second AWM nucleus, organized by Alice Schafer in Boston.)

There is still a big difference between men and women in their experience of a career in the mathematical, computing, and natural sciences. I was recently the representative of the International Council for Industrial and Applied Mathematics (ICIAM) for the Gender Gap in Science project, a large international effort extending over three years, to document this gap. Marie-Françoise Roy was both the representative of the International Mathematics Union (IMU) and the primary organizer. As part

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<sup>1</sup> See the May–June 2000 newsletter, <https://www.drivehq.com/folder/p8755087/1748793885.aspx>.



of its work, the Gender Gap in Science project conducted a world-wide survey answered by 32,000 scientists, 50% women and 50% men. To quote the report:

Its results confirm that the Gender Gap in Science is very real: it exists across all regions, disciplines, and development levels [of countries]. Women's experiences in both educational and employment settings are consistently less positive than men's. Over a quarter of women reported **personally experiencing sexual harassment** at school or work. Women were over 14 times more likely than men to report being personally harassed. There continues to be a **salary gap** between women and men. Becoming a parent had **significantly different impact** on the lives of women and men.

Some of the results of this survey are presented in the book *A Global Approach to the Gender Gap in Mathematical, Computing, and Natural Sciences: How to Measure It, How to Reduce It?* Some analysis is done by discipline and by geographical region. It is available online free, or people can order a print-on-demand version. Visit the website<sup>2</sup> for information on how to access either version. There is also an eight-page illustrated booklet with some highlights from the book, available at that website, which can easily be printed in either a color or a black-and-white version.

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<sup>2</sup> <https://gender-gap-in-science.org>

There is still much more, not in the book, that could be distilled from the complete results of the survey. One thing I found quite striking in the raw data broken out for mathematics, and also for applied mathematics within the category of mathematics, was how different the perceptions are for men and women regarding sexual harassment; basically, men hadn't even heard about it happening in their departments, whereas most women had either had it happen to them, seen it happen, or heard about it happening in their departments. In question 49, respondents were asked if they had ever felt discriminated against for nine possible reasons. For reasons of gender, 44% of women said yes, as against 6% of men; for the reason of being a parent, 12% of women said yes and 1% of men. Of the male respondents, 70% never felt discriminated against for any reason, as opposed to 41% of the female respondents. And then there was question 64, "Have you ever felt discouraged about your field for any of these reasons?" giving seven reasons (research, funding, interaction with colleagues, workplace environment, personal life, family obligation, other). For every single reason, women more frequently reported feeling discouraged than men. I hope that someone (any AWM volunteers?) will ask the Gender Gap project for permission to access this data and publish a paper about it.

There were two other parts of the Gender Gap in Science project: a survey of some of the most important journals in various disciplines to ascertain differences in publication rates by gender, and a database of best practices. I encourage people to look at both, and to contribute to the best-practices database.

## CALL FOR PROPOSALS

### Research Collaboration Conferences for Women

Supported by a National Science Foundation ADVANCE grant, the AWM began working to establish and support research networks for women in all areas of mathematics research. Although that grant has ended, the AWM will continue to provide mentorship and support to new networks wishing to organize a research collaboration conference for women (RCCW), including: help finding a conference venue, help developing and submitting a conference proposal, and help soliciting travel funding for participants.

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](mailto:awm.rccw@gmail.com). Deadlines for submission: **February 1** and **July 1**.

More information about Research Collaboration Conferences for Women, existing RCCW networks, and related initiatives can be found at <http://awmadvance.org/>.

## Emille D. Lawrence Wins AWM Service Award

The Association for Women in Mathematics is pleased to announce that the recipient of the 2021 AWM Service Award is **Emille D. Lawrence**, Term Associate Professor and Chair, Department of Mathematics and Statistics, University of San Francisco. Lawrence is honored for her service as Chair of the Mentor Network Committee, as Chair of the 50th Anniversary Committee and as Founding Faculty Sponsor of the USF AWM Student Chapter.

The AWM Service Award, established by the AWM Executive Committee in November 2012, recognizes individuals for helping to promote and support women in mathematics through exceptional voluntary service to the Association for Women in Mathematics. The award is given annually to a select AWM Volunteer or group of AWM volunteers in recognition of their extensive time and effort devoted to AWM activities.

### Citation

Emille D. Lawrence is recognized for her service as Chair of the 50th Anniversary Committee and her leadership role as Chair, since 2016, of the Mentor Network Committee and for her mentorship as Founding Faculty Sponsor of the AWM Student Chapter at the University of San Francisco. In all of these roles, Lawrence has worked to increase participation in the AWM by a diverse population of mathematicians at all stages of their careers.

The Mentor Network is a well-run, outward-facing program which showcases AWM's commitment to meeting women (and men) where they are. Students at all levels who are interested in mathematics or are pursuing careers in mathematics are matched with mentors based on common interests in careers in academics or industry, math education, balance of career and family, or general mathematical interests. As chair of the Mentor Network Committee, Lawrence liaises with our partner math institutes, creating a pipeline for mentors and mentees. She oversees and works to improve the program and facilitates mentor-mentee relationships as needed.

As chair of the AWM 50th Anniversary Committee, Emille Lawrence has led the planning of activities that will



*Emille D. Lawrence*

both celebrate AWM's past and develop a vision for its future. These efforts have focused on involving the next generation in mathematics and creating a community where all are welcome and can thrive.

A gifted and successful leader, Lawrence has recently become chair of the mathematics department at the University of San Francisco. She has served as Founding Faculty Sponsor of the AWM Student Chapter at USF since 2017.

### Response from Emille D. Lawrence

I am truly honored to be a recipient of an AWM Service Award. I hope that my contributions to the 50th Anniversary Committee and to the Mentor Network have had a positive and measurable impact on women in mathematics and, moreover, the mathematics community as a whole. This work could not have been done without a strong team, so I extend my sincere thanks to the members of each committee. I look forward to continuing my efforts of supporting the AWM mission of promoting women and girls in the mathematical sciences. Thank you once again for this recognition.

**Renew your membership at [awm-math.org](http://awm-math.org).**

## BOOK REVIEW

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

**Power in Numbers: The Rebel Women of Mathematics**, by Talithia Williams, Race Point Publishing, 2018. ISBN 9781631064852.

*Reviewer: Erin Carmody, Fordham University, ecarmody2@fordham.edu*

Upon first impression, this is a visually gorgeous book. It would look great on anyone's coffee table or bookshelf. The cover features portraits of six mathematicians, and the background is a chalkboard with mathematical equations and expressions. The font on the cover and spine is in a bright metallic pink. The contents page reveals three parts to the book, organized chronologically. Part I: The Pioneers, includes mathematicians such as Sophie Germain. Part II: From Code Breaking to Rocket Science, includes such mathematicians as Katherine G. Johnson. And finally, Part III: Modern Math Mavens, includes such mathematicians as Maryam Mirzakhani. There are around 30 mathematicians featured in this engaging and stunning book.

One of the most inspiring mathematicians to me is the author herself: Talithia Williams. In the introduction, we learn about her inspiring career and hear her words of wisdom for women who wish to pursue a life in mathematics. I can relate when Williams says that people are shocked when she tells them she is a mathematician. She admits that even she did not know any women with PhD's in mathematics growing up (I can relate!). In high school she took AP Calculus, where she was among only 25 students in the school enrolled in the class (out of 2000 students) and was one of the only 4 African-American students.

Motivated by extra credit from her teacher Mr. Dorman, she found herself going "up to the chalkboard to work out problems." I think that any young mathematician can relate to the feeling of accomplishment from being able to communicate mathematically at the board! During this formative time, Mr. Dorman told young Williams that she was talented at mathematics and should major in it in college. She did just that! Williams tells a funny story about how she found out at a high school reunion (10 years later) that Mr. Dorman had told this to a lot of students. She reflects that her teacher had acted as a mirror for her own great potential.

As an undergraduate, Williams worked at JPL (NASA's Jet Propulsion Laboratory). Her advisor there, Lonnie Lane,

insisted that she call him by his first name. Being from Georgia, this was not socially acceptable to young Williams. But, he insisted and she said it had the effect that it made her feel like part of the team and that her thoughts and opinions mattered!

Williams' mentor at NASA was Claudia Alexander and was everything that Williams wanted to become. Alexander planted a seed in those three years that lasted a lifetime. Williams was a math major and physics minor at Spelman College. She got a Masters in mathematics at Howard University and a PhD in Statistics at Rice University where she was the only African-American woman in her class. It was at Rice University that she met her husband. Williams is now at Harvey Mudd College acting as a mirror reflecting the potential of her students as her mentors such as Mr. Dorman, Claudia Alexander, and Lonnie Lane reflected her own potential, a few years before.

The thread that binds all of the women selected for this book, according to the author, is that each woman had someone who believed in them and showed them the path. Williams observes, "Many were alone on their journey, but with every female who enters the field of math, it makes it easier and more achievable for the next one, and the one after that." As I read about the lives of these mathematicians, it is clear that the path of math changed their lives as it has changed mine. Williams invites everyone to learn about these women. There is nothing as inspiring as reading about the hills and valleys of a life lived, especially when one chooses a challenging path like mathematics. Reading this book ignited a sense of accomplishment for how far I have made it on my own journey, and pride in the mathematicians who made this possible for me today.

For this review, I'll choose one mathematician from each section, and let the reader enjoy meeting the others. As I sit upon a hill at Liberty State Park, reading and writing about these mathematicians, I have to ask myself: Am I a rebel woman of mathematics? Would I want to be?

From Part I, I chose mathematician Emmy Noether (March 23, 1882 – April 14, 1935). The pages on Noether begin with a quote from Einstein saying that she is the greatest woman creative genius to have ever lived. Nice recommendation! Emmy Noether's father was a leader in algebraic geometry and was a patient and kind teacher. Even though Emmy's father and brothers were highly educated, this was not the intended path for Emmy. Her education was focused on cooking, cleaning, and music. However, Emmy broke the rules and got permission to sit in on classes at the University of Erlangen (where her father taught and brother

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attended). Eventually the rules changed, and Emmy got her PhD in 1907.

Noether's chapter of the book includes several interesting photos (and full-color diagrams), including photos of Einstein and Hilbert and a postcard where Emmy is discussing mathematics with Ernst Fischer. In this chapter, the author explains Noether's Theorem: "In essence, this finding states that whenever there is symmetry in nature, there is a corresponding conservation of energy, momentum and electric charge." Emmy had difficulty securing a paid teaching position, despite her many great contributions in mathematics and physics. She did eventually get a job at Bryn Mawr College, but sadly died rather young in 1935 after a surgery. We see in Emmy's life that even with a mathematical foundation from birth she had to struggle to be an equal, but we also see how much she was able to accomplish with this foundation. No one will ever forget Emmy Noether.

From Part II, I chose Shakuntala Devi (November 4, 1929 – April 21, 2013). When I read about mathematicians such as Devi, it makes me believe that mathematical objects exist in their own reality. This is because Shakuntala Devi is known as "the human computer" and can compute so fast that it seems that she has a secret key to the mysterious realm of mathematics. She says, "Numbers have life, they're not

just symbols on paper." Her extraordinary talent reminds me of the savant Daniel Tammet who has synesthesia and also claims to be able to feel numbers. Devi's father was a circus performer and noticed her incredible talent with numbers, and she soon joined the show calculating cube roots at 5 years old.

Devi did not have a formal education, but began performing her mental calculations at universities in Southern India at 6 years old. In 1977, at Southern Methodist University, she beat a computer in calculating the 23rd root of a 201-digit number. I wonder what it looks like and feels like in her mind! Devi was also a writer and was known for her children's books and books on math, astrology and puzzles. Included in the chapter is a photo of her with a wooden art piece with gold numbers. She lived a fairly long life. Devi inspires me to connect with the numbers directly.

From Part III, I chose mathematician Chelsea Walton (born July 11, 1983). As a child, Walton looked at the world from an alternative perspective. She read a children's dictionary and made a frequency table of the occurrence of letters in the book. She remembered the animated *Donald in Mathmagic Land* and how it inspired her to see math not as a chore, but as a puzzle. By the time she was in high school, she was researching careers in math: she searched on "can I do logic puzzles all day and get paid for this?" Indeed one can, and even go for beers after!

## 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 support for travel and subsistence for a meeting or conference in the applicant's field of specialization.

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

**Eligibility and Applications.** Please see the website (<https://awm-math.org/awm-grants/travel-grants/>) for details on eligibility and do not hesitate to contact [awm@awm-math.org](mailto: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.**



**In conclusion, I recommend this book as much as I recommend a career in research mathematics. It is a must-have for any mathematicians' bookshelf, but I'll warn you to bring the tissues because reading about the difficult lives of the women that came before is not so easy. But as the title reflects, there is power in numbers.**

Walton seems like a focused and determined individual. She must be great at proving theorems! After she found out that a career in mathematics was possible, she started emailing math professors. She came to the conclusion that the next step would be to get a PhD in math in order to have a career in mathematics.

Walton studied for her Bachelor of Science at Michigan State University where she found a mentor, Jeanne Wald who works in non-commutative ring theory. Next, Walton started graduate school at the University of Michigan and finished at the University of Manchester with her thesis advisor Toby Stafford. Another advisor was Karen E. Smith (a ring theorist who is also featured in the book). Walton successfully defended her dissertation "On Degenerations and Deformations of Sklyanin Algebras" in 2011. Walton's postdoctoral career includes: the University of Washington, the Mathematical Sciences Research Institute, and the Massachusetts Institute of Technology. In 2015 she became a professor at Temple University, and in 2017, a research

fellow for the Sloan Foundation. She is famous for her great work in quantum symmetry, representation theory, Hopf algebras, and Nakayama automorphisms.

I can really relate to Chelsea Walton when she says, "I really like the lifestyle—math research is a creative job and the hours are not routine." I think many people would be surprised to find out that being a research mathematician is similar to being an artist. And she says:

"Genuinely connecting with a wide variety of people (whether it's writing a paper together, having lunch, mentoring, being mentored, ...), while being 100% myself, is one of my proudest achievements in math." This is my favorite part of being a mathematician: the community, the after-seminar beers, the mathematical conversations.

Walton now lives in Illinois with her husband and two dogs, as she begins a tenured position at the University of Illinois-Champaign. As I sit upon this hill thinking of these great mathematicians, I think I would like to be a rebel woman of mathematics like Chelsea Walton. I want to burn bright, but for a long time, and feel the numbers like Devi. In conclusion, I recommend this book as much as I recommend a career in research mathematics. It is a must-have for any mathematicians' bookshelf, but I'll warn you to bring the tissues because reading about the difficult lives of the women that came before is not so easy. But as the title reflects, there is power in numbers.

## CALL FOR NOMINATIONS

### The 2022 AWM-Sadosky Research Prize in Analysis

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

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

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted. Nominations of members of underrepresented minorities are especially welcome. The nomination should include: 1) a one to three page letter of nomination highlighting the exceptional contributions of the candidate, 2) a curriculum vitae of the candidate not to exceed three pages, and 3) three letters supporting the nomination (submitted independently). Nomination materials should be submitted online at [MathPrograms.org](https://mathprograms.org). The submission link will be available 45 days prior to the nomination deadline. Review of candidates will begin in mid-February. For full consideration, nominations should be submitted by **February 1, 2021**. If you have any questions, phone 401-455-4042, email [awm@awm-math.org](mailto:awm@awm-math.org) or see <https://awm-math.org/awards/awm-sadosky-research-prize/>

## EDUCATION COLUMN

Education Column Editor: Jackie Dewar, Loyola Marymount University, [jdewar@lmu.edu](mailto:jdewar@lmu.edu)

### Guidelines for Assessment and Instruction in Statistics Education – Part Deux

Anna Bargagliotti, Loyola Marymount University, [Anna.Bargagliotti@lmu.edu](mailto:Anna.Bargagliotti@lmu.edu)

*“It is critical that statisticians, or anyone who uses data, be more than just data crunchers. They should be data problem solvers who interrogate the data and utilize questioning throughout the statistical problem-solving process to make decisions with confidence, understanding that the art of communication with data is essential” (GAISE II).*

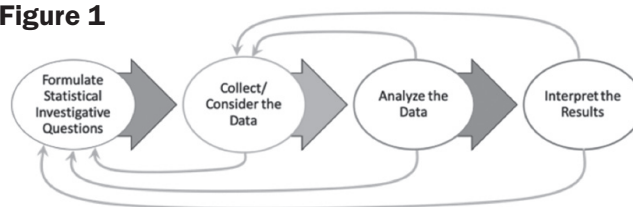
In 2020, the American Statistical Association (ASA) and the National Council of Teachers of Mathematics (NCTM) will jointly publish the *Guidelines for Assessment and Instruction in Statistics Education II: A Framework for Statistics and Data Science Education report (GAISE II)*. The forthcoming report (Bargagliotti, Franklin, Arnold, Gould, Johnson, Perez, & Spangler, 2020) presents a set of recommendations towards data acumen at the school-level. Data acumen is defined in a National Academies of Sciences, Engineering, and Medicine report (2018) as the ability to make good judgments and decisions with data. Data acumen is “not a final state to be reached but rather a skill that data scientists develop and refine over time” (p. 12). *GAISE II* offers an update to the original report, *Guidelines for Assessment and Instruction in Statistics Education: A Pre-K–12 Curriculum Framework (GAISE I)*, published in 2005 ([https://www.amstat.org/asa/files/pdfs/GAISE/GAISEPreK-12\\_Full.pdf](https://www.amstat.org/asa/files/pdfs/GAISE/GAISEPreK-12_Full.pdf)). *GAISE I* provided a framework of recommendations for the evolution of statistical concepts and the development of foundational skills for statistical reasoning of students across the school years described as levels A, B, and C, roughly equivalent to elementary, middle, and high school. These levels are maintained in *GAISE II*; however, the achievement of data acumen in the PreK–12 *GAISE* (both *I* and *II*) is intended for any individual, regardless of age, who is striving to achieve statistical literacy.

An important contribution of the first *GAISE* report was the articulation of the statistical problem-solving process. The process was defined by four components: formulating questions, collecting and considering data, analyzing data, and interpreting data. This statistical problem-solving process is the pillar of statistical practice. *GAISE II* articulates how the statistical problem-solving process becomes

more sophisticated throughout the levels A, B, and C, and it develops 22 examples to show how the process is carried out.

*GAISE II* incorporates the enhancements and new skills needed for making sense of data today while maintaining the spirit of *GAISE I*. *GAISE I* primarily focused on traditional data types from quantitative to categorical variables and study designs using smaller data sets of samples from a population; but since its publication, data types have expanded, necessitating the acquisition of different and new statistical skills. For example, today data can be text or pictures posted on social media or collections of pictures, sounds, or videos collected automatically by our devices. Data are vast and readily available. Data are also multidimensional with data visualizations often needing to display many variables simultaneously. While data and the way we think about data have changed over the last fifteen years, the statistical problem-solving process pictured in Figure 1 remains a pillar in *GAISE II*.

Figure 1



The statistical problem-solving process embodies how statisticians approach a problem: guided by a research question, data are collected or considered, then analyzed and ultimately interpreted. Within the statistical problem-solving process, *GAISE II* highlights the following:

1. The importance of questioning through each stage of the statistical problem-solving process (formulating a statistical investigative question, collecting or considering data, analyzing data, and interpreting results) and how this process remains at the forefront of statistical thinking;
2. The consideration of different data and variable types and the importance of carefully designing how the data will be collected or considered to answer a statistical investigative question, the process of collecting and cleaning the data, the interrogation of the data, and the analysis of the data;
3. The inclusion of multivariate thinking throughout all levels of K–12 education.
4. The role of probabilistic thinking in quantifying randomness used by students throughout all school levels;
5. The shifts and deepening of the role of technology throughout K–12 (school level) education;
6. The importance of how, now more than ever, statistical information is communicated.

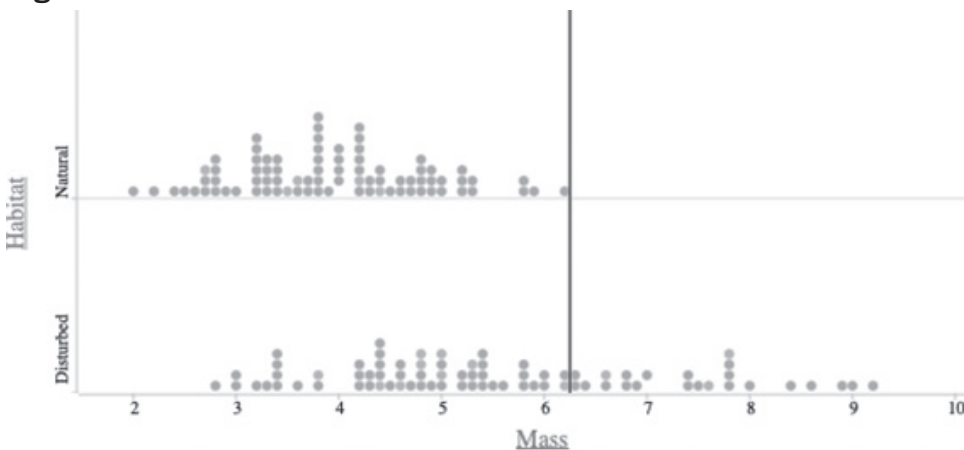
Never has data and statistical literacy been more important than today. Processing information associated with global issues such as the COVID-19 pandemic (the first global pandemic since 1918), extreme weather conditions and a changing planet, economic upturns and downturns, and important social issues such as the Black Lives Matter movement are a few cases in point. A statistically literate person must be able to evaluate the conclusions drawn from data and the legitimacy of reported results from statistical studies and to interact with data visualizations (both interactive and static) to extract relevant information.

### Level C Lizards Example from *GAISE II*

The lizards example in *GAISE II* (Level C in the report) illustrates an important example that develops fundamental ideas used in classification problems. Suppose students in a science class are exploring the impact of human development on wildlife. In an earlier analysis, students discovered that lizards in “disturbed” habitats (habitats with substantial human development) tended to have greater mass than lizards in natural habitats. Based on this prior knowledge, students pose the following statistical investigative question: Can a lizard’s mass be used to predict whether it came from a disturbed or a natural habitat?

A biologist captured a number of individuals from one species of lizard, *Anolis sagrei*, across two different habitat types on each of four islands in the Bahamas. A total of 159 lizards were captured, 81 from natural habitats, 78 from disturbed habitats. Once captured, the lizards were measured across several physical characteristics, including their mass, length, breadth, foot span, head width, etc. Lizards captured from habitats with human development were labeled “disturbed” and those captured from habitats without development were labeled “natural.” The posed statistical investigative question relies on only two variables: habitat and mass (measured in grams). Data from a comparative

**Figure 2**



dotplot (Figure 2) of the mass shows considerable overlap between the two types of habitats.

A classification approach to answer the posed question requires students to propose a rule, based on the mass of the lizard, which predicts the type of environment the lizard came from. For example, consider a potential rule that classifies lizards with mass less than 6.25g to be from natural habitats (“natural”). (In Figure 2 the vertical line is located at mass = 6.25 g.)

The dotplot shows that if lizards with a mass less than 6.25g are classified as from natural habitats then 100% of these lizards are correctly classified (because all of these lizards in our sample have mass less than 6.25g). However, a high percentage ( $55/78 = 0.705 = 70.5\%$ ) of the lizards that are from disturbed habitats will be misclassified, as they also have a mass less than 6.25g. Because the dot plots show a lot of overlap in the masses of the two groups, the classification of a lizard as coming from a disturbed or a natural habitat is not straightforward.

A confusion matrix (Figure 3 on page 12) shows the true values in the columns and the classification categories in the rows (or vice versa). Thus, the upper-left cell of the matrix below indicates that 23 lizards were correctly classified as belonging to a disturbed habitat. A perfect classifier will have 0’s on the off-diagonal. The matrix shows that all 81 of the lizards from natural habitats were classified as natural, but 55/81 lizards from disturbed habitats were incorrectly classified. Overall, the misclassification rate is (number of lizards misclassified)/total number of lizards =  $(55+0)/(23+0+55+81) = 0.346$  or about 35%.

Students can explore which different classification rules produce the lowest misclassification rate. In addition, classification rules can apply to multiple explanatory variables. For example, the lizards may be classified not only using their mass but also using, for example, head depth or hind limb length. In this multivariate case, a Classification and Regression Tree (or CART) can be used. CART is an example of

a modern statistical approach that relies on an algorithm, rather than a mathematical model. An “algorithm” in this case refers to a series of rules. Using the data presented in *GAISE II*, a CART algorithm begins with splitting the data according to the rule: classify a lizard as natural if its mass is less than 5g. This rule splits the data into two groups. One group consists of lizards less than 5g that are classified as

*continued on page 12*

**Figure 3**

	Truly from Disturbed Habitat	Truly from Natural Habitat
Classified as “disturbed”	23	0
Classified as “natural”	55	81

“natural” (even though this group may contain some that are not from the natural habitat), and the other group that are larger than 5g that are classified as “disturbed” (even though some may not be from the disturbed habitat).

At this point, further classification rules can be applied. For example, students may state:

- 1) If the mass is less than 5g, consider the head depth. If the head depth is less than 5.25mm, classify as “disturbed.” If the head depth is greater than or equal to 5.25mm, classify as “natural.”
- 2) If the mass is greater than or equal to 5g, classify as “disturbed.”

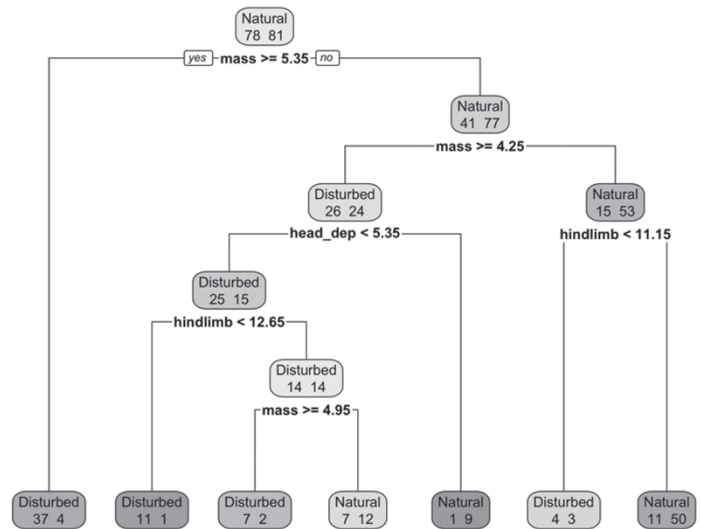
At each step, any variable may be considered in order to split the data into two classification groups. The CART algorithm does what no human would be patient enough to do. At each step of the process, it considers all available variables and all possible cut-off values. It determines which provides the lowest misclassification rate, and then it splits the data based on that rule.

The tree figure in Figure 4 is an example of a CART algorithm carried out using software. Each split in the tree contains a rule stated as a condition. If the condition is true, one moves down the left branch, and continues in this fashion until reaching an end node. The node indicates how to classify the observation. Similar to the single variable case, correct classification rates can be computed.

**A Future Driven by Data**

An enormous amount of personal data is generated each day. It has been estimated that an individual generates on average one gigabyte of data each day. Working with data today raises questions about the ethical considerations with data collected on individuals as well as equity issues with the availability of technology. Ideally, such data would be used to better society and quality-of-life across the globe. *GAISE II* lays the foundation for the skills needed to organize data, to clean data, make judgments about the appropriateness of

**Figure 4**



data for answering statistical investigative questions, and making predictions using data.

As stated in *GAISE II* (Introduction and Framework Section),

Data are used to tell a story. Statisticians see the world through data—data serve as models of reality. Statistical thinking and the statistical problem-solving process are foundational to exploring all data.

The vision *GAISE II* tries to convey is one where every individual should feel confident in being able to reason statistically and to make sense of data but at the same time, know how and when to question as a healthy skeptic of information.

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Bargagliotti, A., Franklin, C., Arnold, P., Gould, R., Johnson, S., Perez, L., & Spangler, D. (2020). *Pre-K–12 Guidelines for assessment and instruction in statistics education (GAISE) report II*. Alexandria, VA: American Statistical Association and Reston, VA: National Council of Teachers of Mathematics. (To be available at [www.amstat.org](http://www.amstat.org).)

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## Resources for Dismantling Inequity

Jackie Dewar, Professor Emerita, Loyola Marymount University

This year Anna Bargagliotti and I exchanged spots in the “regular” rotation of Education Column writers. My column appeared in Anna’s normal June/July spot and hers is here in my usual November/December slot. In addition, I am including this short piece to share some resources for dismantling inequity in higher education.

I begin with two resources on the AWM website that I strongly encourage readers to access if they have not done so already.

At <https://awm-math.org/policy-advocacy/endorsements>, readers will find AWM’s 6/1/20 Statement of Solidarity with the National Association of Mathematicians (NAM). Founded in 1969, NAM (see <https://www.nam-math.org>) is a non-profit professional organization in the mathematical sciences with the mission to promote excellence in the mathematical sciences and to promote the mathematical development of all underrepresented minorities. The Statement acknowledges “the role that higher education has played in maintaining structures of inequality” and suggests concrete actions to take.

COVID-19 has exacerbated existing inequities and created new ones (especially for women in academia). AWM’s recently developed COVID-19 webpage (<https://awm-math.org/covid-19>) provides information on women and academic output and has links to COVID-19 webpages of other mathematics professional societies.

On July 1, 2020, *Inside Higher Ed* published a list of practical ways non-Black faculty can help dismantle educational inequities, titled “A Dozen-Plus Ways You Can Foster Educational Equity.” Written by a biologist and two psychologists, the article begins with concrete things to say and do in the classroom and moves on to suggest actions surrounding hiring and supporting colleagues of color. A quick read and worth your time (I think), the article is available at <https://www.insidehighered.com/advice/2020/07/01/list-practical-ways-non-black-faculty-members-can-help-dismantle-educational>.

For anyone interested in bringing social justice into their classroom, there is a new resource—*Mathematics for Social Justice: Resources for the College Classroom*—the first of a two-volume set, edited by Gizem Karaali and Lily S.

Khadjavi, published by MAA Press<sup>i</sup> (see <https://bookstore.ams.org/clrm-60>). A recent interview with the two editors appeared in *MAA Focus* (see <http://digitaleditions.walworthprintgroup.com/publication/?m=7656&i=663226&p=16>)<sup>ii</sup>.

A web search for additional resources led me to an interesting collection of books, articles, and blogs on mathematics and justice at <https://sites.google.com/site/mathandsocialjustice/my-reading-list>. Since several books I have frequently recommended<sup>iii</sup> appear on this list, I include this link as well. I plan to explore a few of the entries in it that are new to me. The webpage seems to be the work of a community of math teachers, who blog, tweet, or read blogs or tweets, known as the Math-Twitter Blog-o-Sphere (<https://mtbos.org>).

Finally, there is a new digital library of photos, videos, and other media featuring women in STEM fields—the IF/THEN<sup>®</sup> Collection, intended for use by individuals and non-profit entities for educational and other non-commercial purposes. See <https://www.ifthencollection.org>. It features 125 female STEM innovators selected by the American Association for the Advancement of Science (AAAS) and Lyda Hill Philanthropies<sup>®</sup> (<https://www.lydahillphilanthropies.org>) to be AAAS IF/THEN<sup>®</sup> Ambassadors (<https://www.aaas.org/page/ifthen-ambassadors>). These Ambassadors are to serve as role models for girls. Among the IF/THEN<sup>®</sup> Initiative’s goals are changing perceptions of who works in STEM and inspiring middle school girls to pursue STEM careers. Also planned as part of the Initiative are public art exhibits based on 122 3-D printed statues of contemporary female STEM professionals and role models from a variety of industries including entertainment, sports, business, and academia. I learned from the exhibit website (see <https://ifthenexhibit.org/about>) that IF/THEN is short for “If she can see it... then she can be it.”

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<sup>i</sup>Karaali, G., & Khadjavi, L. S. (Eds.). (2019). *Mathematics for Social Justice: Resources for the College Classroom*. MAA Press.

<sup>ii</sup>Edholm, C. (2020, June/July). Mathematics for Social Justice: An Interview with the Editors. *MAA Focus*, 40(3), 16–18.

<sup>iii</sup>*Beyond Banneker: Black Mathematicians and the Paths to Excellence* by Erica Walker, published (2015) by SUNY Press; *Hidden Figures: The American Dream and the Untold Story of the Black Women Mathematicians Who Helped Win the Space Race* by Margot Shetterly, published (2016) by HarperCollins; and *Whistling Vivaldi: How Stereotypes Affect Us and What We Can Do* by Claude Steele, published (2010) by W. W. Norton.

# EvenQuads: Celebrating Women in Math

*Denise Rangel Tracy on behalf of the Project Management Committee*

Introducing EvenQuads, a new card deck created by AWM in celebration of our 50th anniversary! The double-sided deck allows for five different games to be played. One side of the cards has symbols representing four mathematical organizations. The other side features biographies and hand-drawn portraits of notable women in mathematics created by the larger mathematical community. The full project consists of four decks of sixty-four cards each and the first deck is ready to be produced! We are currently running a Kickstarter campaign to accomplish this. For only \$18 (including domestic shipping) you can own the first deck of EvenQuads: go to <https://www.kickstarter.com/projects/evanquads/evanquads> to purchase.

The games are intended for people of all mathematical and non-mathematical backgrounds, ages 10 years and up. There are two types of games that can be played: Quad Collector and EvenBetter. The main goal of all the Quad Collector games is to collect cards with an even number of attribute states in common. There are solitaire, group, and gin rummy versions of this game and all are played with the logo sides of the cards. The flip sides of the cards, featuring notable women mathematicians, are used to play EvenBetter. This is a cooperative game in which players create yes/no questions that can be asked about the women on the cards and work to find women who correspond to all pairings of yes/no answers to the questions. EvenBetter can be played with four or eight players and there is also a solitaire version. The mathematics and regular Quad Collector game were developed by AWM member Lauren Rose and Jeffrey Pereira. The EvenBetter games are based on the game Orthogonal Questions invented by Jonah Ostroff. Full descriptions of and rules for all five games are at the project website <https://awm-math.org/publications/playing-cards/>.

Creating and producing EvenQuads has involved hundreds of volunteers who contributed countless hours working to make this project a reality, including such aspects as researching production and fulfillment, evaluating graphic design, creating the deck insert, writing biographies, and drawing portraits. These helpful folks are all listed at the project website.



**This EvenQuads deck is not only a celebration of women in mathematics but of an entire community that works to support and encourage them. We are asking for that support once again in making our Kickstarter campaign a success.**

The process of choosing the women to feature on this first deck was a long one as the project management committee wanted to ensure these selections accurately reflected the community. Around a dozen major sources were used, and nominations were solicited, to find 1400 nominees for inclusion. Volunteers worked for several months gathering biographical and professional data on these women. A detailed evaluation rubric was developed and the Qualtrics survey software was used to gather assessments from reviewers. In order to acknowledge that there are many different ways to contribute as a mathematician, the rubric was organized around five pillars of achievement: mathematical research, mathematics education, contribution in business, industry, and government (BIG), establishing, cultivating and sustaining mathematical communities, and increasing the participation of women and under-represented groups. Each nominee was then reviewed by two people using the rubric. Using these reviews, the committee identified more than two hundred truly amazing women mathematicians and chose a subset of them to appear on the first deck. We valued and prioritized equitable representation across multiple demographic groups, mathematical fields, and different contributions to the mathematical community. The choices were tough, and the committee is already excited about many women slated to appear on future decks. So if you don't see your favorite woman mathematician on the first deck, just wait for the other decks to be completed.

This EvenQuads deck is not only a celebration of women in mathematics but of an entire community that works to support and encourage them. We are asking for that support once again in making our Kickstarter campaign a success.

# Suzanne L. Weekes Named SIAM Executive Director

*SIAM, Philadelphia, PA, September 2020*

The Society for Industrial and Applied Mathematics (SIAM) has announced the appointment of Dr. Suzanne L. Weekes, Associate Dean of Undergraduate Studies, ad interim, and Professor of Mathematical Sciences at Worcester Polytechnic Institute (WPI), to the position of Executive Director. In her new role, Weekes will continue to build SIAM's reputation as the leading professional society for applied mathematicians and computational scientists.

With a BS in Mathematics from Indiana University, a PhD in Mathematics and Scientific Computing from the University of Michigan and having done her post-doctoral work at Texas A&M University, Weekes serves on SIAM's Council and is a member of the Science Policy committees of both the American Mathematical Society (AMS) and SIAM. As part of her science policy work, Weekes recently chaired the SIAM Task Force on Future Research Directions for NSF in the Era of COVID-19, the goal of which was to make recommendations to NSF on future applied mathematics and computational science research directions given the COVID-19 pandemic.

**“We need to make sure that the public and policymakers understand the importance and impact of what applied mathematicians and computational scientists do.”**

“After nearly six months of interviewing many extraordinary and passionate candidates, the search committee is proud to appoint Suzanne as SIAM's third Executive Director,” said Margot Gerritsen, Chair of the SIAM Board of Trustees. “In Suzanne's words, ‘SIAM is the voice of applied mathematics’ and we know that under her leadership, that voice will sound clear and true.”

Weekes is also an At-Large Member of the Executive Committee of the Association for Women in Mathematics (AWM) and is a member of the National Association of Mathematicians (NAM). She is the recipient of a 2020 Haimo Award for Distinguished College or University Teaching of Mathematics from the Mathematical Association of America (MAA). She also received the 2019 Humphreys Award for mentoring from AWM. Weekes is a past Chair of the SIAM Education Committee and was the faculty founder of the WPI SIAM Student Chapter in 2003, where she has served as the faculty advisor to the chapter since.



*Suzanne L. Weekes*

“SIAM has always been a special and important organization to me, personally and professionally,” Weekes commented. “In fact, the SIAM Annual Meeting was the first conference I attended when I was a graduate student in the 90s, and a couple years later, the first conference at which I presented. The organization has been instrumental in my career, and what a culmination of that to now have the honor of serving as Executive Director.”

Weekes' research work is in numerical methods for differential equations including applications to spatio-temporal composites and cancer growth. She is also focused on initiatives connecting the academic mathematics community to mathematics and statistics work in business, industry, and government, and is passionate about making the mathematical sciences accessible to the public.

“COVID-19 has driven home the critical importance of science, technology, and math,” says Weekes. “In this pandemic era, we are relying on scientists to help us understand, analyze, and solve critical problems—to make us healthy and keep us safe. Research coming out of the SIAM community reflects the best of modern science and technology. We need to make sure that the public and policymakers understand the importance and impact of what applied mathematicians and computational scientists do.”

Weekes will begin her new role January 1, 2021 and succeeds Dr. James M. Crowley, who served SIAM for 25 years as Executive Director and recently retired.



## MAD Pages Update

*On October 9, 2020, there was an unveiling of the updated website *Mathematicians of the African Diaspora*, a site first created by Scott Williams (SUNY Buffalo) in 1997. The new site is <http://www.mathad.com>. This is the culmination of a 10-year project undertaken by Edray Goins (Pomona College), Don King (Northeastern University), Asamoah Nkwanta (Morgan State), and John Weaver (Varsity Software).*

In 1997, Scott Williams (SUNY Buffalo) founded the website *Mathematicians of the African Diaspora*, which has since become widely known as the MAD Pages. According to a 2019 blog written by Scott Williams for the American Mathematical Society, “As a child I was struck by the emphasis, within the general American culture, upon achievements in the Sports/Entertainment Industry as indications of success. Within the African American subculture, those indications are even stronger—just consider the winners of the NAACP Image Awards among other celebrations. On the rare occasion a scientist has won an award, there has been a limitation to the medical field. In addition, where it concerns successes in mathematics and the sciences, I discovered much incorrect or misconstrued information available in texts and especially on the web.”

Williams built the site over the course of 11 years, creating over 1000 pages by himself as a personal labor of love. The site features more than 700 African Americans in mathematics, computer science, and physics as a way to showcase the intellectual prowess of those from the Diaspora. Williams provided profiles of these individuals, detailing their education, their journey within mathematics thus far, and their accomplishments. He also created numerous pages discussing Black history within the mathematical sciences and presented data on the demographics of Black people in the mathematical sciences at the time. Since its creation, the MAD Pages have received more than 20

million visitors and provided immeasurable inspiration and validation to many Black mathematicians and students.

Scott Williams retired in 2008. After an initial town hall meeting about the future of the MAD Pages, which took place at a Conference for African American Researchers in the Mathematical Sciences (CAARMS), an informal group of mathematicians decided to work together to preserve Williams’ work. In 2015, the National Association of Mathematicians (NAM) formed an ad hoc committee to update the MAD Pages, consisting of NAM President Edray Goins (Pomona College), Committee Co-Chairs Don King (Northeastern University) and Asamoah Nkwanta (Morgan State University), and web developer John Weaver (Varsity Software). The MAD Pages Update Project was funded in part by Temple University, the Educational Advancement Foundation (especially Albert Lewis and Harry Lucas), the Mathematical Sciences Research Institute (MSRI), the National Science Foundation (DMS-1560394), Northeastern University, Pomona College, and Washington & Lee University. We employed nearly four dozen undergraduate students from across the country to assist with this project; they greatly contributed to the database’s depth and accuracy.

The updated MAD Pages will be unveiled to the public on October 9, 2020. “This unveiling date intentionally coincides with the death of Benjamin Banneker, arguably the first African American mathematician,” states committee member Edray Goins. “His collected works were lost in a mysterious fire which occurred on the day of his funeral. MAD Pages is dedicated to the quest of preserving the memory of African American mathematicians, lest they be lost forever.” The new pages consist of a database containing biographical information of more than 700 mathematical scientists from the diaspora. This site employs a wiki model, allowing users to create their own profiles and update any incorrect information. The new site can be found at <http://www.mathad.com>.



ASSOCIATION FOR  
WOMEN IN MATHEMATICS

**You can renew your  
membership at [awm-math.org](http://awm-math.org).**



# AWM Workshop at the 2021 SIAM Annual Meeting

**Application deadline for graduate students: November 15, 2020**

For many years, the Association for Women in Mathematics has held a series of workshops for women graduate students and recent PhDs in conjunction with major mathematics meetings. Since 2016, these workshop talks have been supported by the AWM ADVANCE grant. The AWM Workshops serve as follow-up workshops to Research Collaboration Conferences for Women, featuring both junior and senior women speakers from one of the Research Networks supported by the ADVANCE grant. An AWM Workshop is scheduled to be held in conjunction with the 2021 SIAM Annual Meeting in Spokane, Washington, July 19–23, 2021.

**FORMAT:** The workshop will consist of two research minisymposia focused on **Control and Optimization in Differential Equations** organized by Lorena Bociu and Mary Ann Horn, a Poster Session and an informational minisymposium directed at starting a career. Selected junior and senior women from the Research Collaboration Conference for Women (RCCW) WIC will be invited to give 20-minute talks in the two research minisymposia. The speakers will be supported by the National Science Foundation AWM ADVANCE grant: Career Advancement for Women Through Research-Focused Networks. The Poster Session will be open to *all* areas of research; graduate students working in areas related to control and optimization in differential equations are especially encouraged to apply. The graduate students will be selected through an application process to present posters at the Workshop Poster Session held in conjunction with the SIAM Poster Session. AWM will offer partial support for travel and hotel accommodations for the selected graduate students, pending funding. The workshop will include a luncheon and mentoring session where workshop participants will have the opportunity to meet with other women mathematicians at all stages of their careers, and a career panel which will be open to the public. In particular graduate students working in areas related to control and optimization in differential equations will have the opportunity to connect with the Women in Control (WIC) Research Network.

All mathematicians (of all genders) are invited to attend the talks, career panel and poster presentations. Departments are urged to help graduate students and junior faculty who are not selected for the workshop to obtain institutional support to attend the presentations.

**MENTORS:** We also seek volunteers to act as mentors for workshop participants, in particular the graduate students. If you are interested in volunteering, please contact the AWM office at [awm@awm-math.org](mailto:awm@awm-math.org) by **May 15, 2021**.

**ELIGIBILITY:** To be eligible for selection and funding, graduate students must have made substantial progress towards their theses. Women with grants or other sources of support are welcome to apply. All non-US citizens must have a current US address. Applications from members of underrepresented minorities are especially encouraged.

All applications should include:

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

Applications must be completed electronically by **November 15, 2020**.

See <https://awm-math.org/meetings/awm-siam/>.

# Announcements

## AWM Online Store

The launch of the AWM online store was announced in our October e-Communication, and we are reporting on it here to be doubly sure you know about it! Currently we are selling quality T-shirts and onesies that are screen-printed by ASCOTT, a small women-owned company. Visit <https://store.awm-math.org/> to make your first purchase or to volunteer your help. Branwen Schaub is Merchandising Coordinator and will be happy to answer your questions at [merchandise@awm-math.org](mailto:merchandise@awm-math.org).



*Michelle Snider and her new T-shirt*

edge

proudly presents



The  
Karen

EDGE  
Fellowship

The EDGE Foundation has received an extraordinary gift from Abel Prize winner, Karen Uhlenbeck. Her generous gift has been used to establish The Karen EDGE Fellowship Program to support and enhance the research programs and collaborations of mid-career mathematicians who are members of an underrepresented minority group. Applications will be evaluated by a review committee consisting of mathematicians appointed by the EDGE Foundation Board.

**Eligibility:** Fellowships are available to mid-career mathematicians employed in full-time positions in the U.S. Applicants must be US citizens or permanent residents with a PhD or equivalent who are underrepresented minorities. Mathematicians of any gender identity are eligible.

**Funding:** The award consists of \$8000 per year for three years including funds to support one trip per year to the Institute for Advanced Study in Princeton (travel only; the Institute will provide local expenses) to meet Karen and members of the community. Valid expenses include travel by the Fellow, the Fellow's graduate students, or the Fellow's collaborators for the purpose of advancing the proposed

## NSF-AWM Mentoring Travel Grants for Women

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

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

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

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

research project, scientific computing, supplies, books, and professional memberships. Teaching buyouts or salary supplements are not permitted.

**Reporting Requirements:** An annual progress report and financial statement are expected annually within two months of the end of each academic year.

The application consists of the following: Personal Statement (1 page); Research Description (2 pages, not including references); Curriculum vitae (2 pages); Three-year plan for use of the Fellowship (1 page); Budget Outline (1 page; include travel to Princeton, NJ); Current and pending funding support.

**Deadline:** Applications should be submitted to <https://www.mathprograms.org/db/EDGE/980/> and are due by **February 1, 2021**.

One awardee will be announced by May 1, 2021. (For more information about the EDGE Foundation, see <https://www.edgeforwomen.org/support-edge/the-edge-foundation/>.)

## 2019 AAAS Fellows

*AAAS, November 2019*

The American Association for the Advancement of Science has named its 2019 class of Fellows. We congratulate new Fellows of the Section on Mathematics, Lisa J. Fauci, Tulane University, and Kavita Ramanan, Brown University, and new Fellows of the Section on Statistics, Nandini Kannan, Indo-US Science and Technology Forum (IUSSTF), Kathryn Roeder, Carnegie Mellon University, and Susan M. Shortreed, Kaiser Permanente Washington Health Research Institute.

## 2020 CRM-Fields-PIMS Prize

*Fields Institute news*

Catherine Sulem, F.R.S.C. and Professor of Mathematics at the University of Toronto, has been awarded the CRM-Fields-PIMS prize for outstanding achievement in the mathematical sciences. Professor Sulem is the second woman to be awarded the prize since its inception in 1994.

“It is a great honour for me to be awarded the 2020 CRM-Fields-PIMS prize,” said Sulem, upon being notified of her award. “I have participated in many wonderful programs at the Institutes and would like to thank them for their support of the entire Canadian mathematical community. I am also grateful to my collaborators, who have played a vital role in my research. I thank all of them for their inspiration and friendship.”

Sulem is being recognized for her numerous and influential contributions to the study of non-linear partial differential equations. Her deep results on the non-linear Schrödinger equation resolved multiple questions that had resisted analysis for years. In particular, her work is central to the understanding of self-focusing singularities to this equation. Her analysis of water waves introduced powerful new probabilistic ideas to that field. These and other ground-breaking achievements have been acknowledged earlier through her election as a Fellow of both the Royal Society of Canada and the American Mathematical Society, through winning the Krieger-Nelson Prize of the Canadian Mathematical Society and the 2019 Association for Women in Mathematics – Society for Industrial and Applied Mathematics (AWM-SIAM) Sonia Kovalevsky Lecture, and through the award of a Killam Research Fellowship of the Canada Council for the Arts.

The CRM-Fields-PIMS prize is the premier Canadian award for research achievements in the mathematical sciences. It is awarded jointly by the three Canadian mathematics institutes: Centre de Recherches Mathématiques in Montreal, the Fields Institute in Toronto, and the Pacific Institute for the Mathematical Sciences in Vancouver. Sulem will receive a monetary award and an invitation to present a lecture at each institute. The prize was established by the Centre de Recherches Mathématiques and the Fields Institute as the CRM-Fields prize in 1994, and the Pacific Institute for the Mathematical Sciences became an equal partner in 2005.

## 2020 Dannie Heineman Prize for Mathematical Physics

*AIP News, October 2019*

The American Institute of Physics and the American Physical Society announce Svetlana Jitomirskaya, from the University of California, Irvine, as the recipient of the 2020 Dannie Heineman Prize for Mathematical Physics. The award is given annually to recognize significant contributions to the field. Jitomirskaya is the second woman to receive this award.

“I am tremendously grateful for this recognition,” said Jitomirskaya, who cites her influences as mathematician Jean Bourgain and Barry Simon, a 2018 Heineman Prize recipient.

“We are excited to present this year’s Heineman Prize for Mathematical Physics to Dr. Svetlana Jitomirskaya,” said Michael Moloney, chief executive officer of AIP. “Over

*continued on page 20*

## ANNOUNCEMENTS *from page 17*

the course of her nearly three-decade career, she has made invaluable contributions to her field. We at AIP thank her for her work and congratulate her on this win.”

The citation on the award reads:

for work on the spectral theory of almost-periodic Schrödinger operators and related questions in dynamical systems. In particular, for her role in the solution of the Ten Martini problem, concerning the Cantor set nature of the spectrum of all almost Mathieu operators and in the development of the fundamental mathematical aspects of the localization and metal-insulator transition phenomena.

Jitomirskaya, a mathematician, described her foray into mathematical physics as serendipitous:

At the school of math at Moscow State, we were supposed to choose an advisor and department by the end of the second year of the undergraduate. For me, it meant the ripe old age of 17. Among the professors in my classes, Yakov Sinai and Vladimir Arnold were my favorite, so I was choosing between their departments, probability and differential equations. I, of course, knew they were great mathematicians, but who could have known they were both hidden mathematical physicists?

Could it just be that the physics community and I have similar tastes in math? I went with Sinai, because he noticed me and invited me to attend a learning seminar.

After earning her doctorate at Moscow State, Jitomirskaya ended up at UCI, where mathematical physicist Abel Klein became her mentor. She said this combination of advisor, subsequent mentor and welcoming mathematical physics community early on placed her solidly into the field.

Jitomirskaya cited her work on quasiperiodic localization as her main accomplishment in her career to date:

Quasiperiodic localization is a topic that has been traditionally approached via a form of the Kolmogorov-Arnold-Moser theorem and technique, which is used to prove persistence of quasiperiodic motions under small perturbations in infinite-dimensional space, requiring intricate methods designed to deal with small denominators that appear in perturbative expansions. I developed a new, simple and more direct approach that has allowed us to obtain a result up to the phase transition point.

Jitomirskaya said she is currently working on a physics project that doesn't focus on her mathematical skills for the first time.

## CALL FOR PAPERS

### AWM Anti-Racism Initiative

As a way of upholding the values outlined in AWM's Statement of Solidarity with NAM following George Floyd's death, we are reserving space in our bimonthly newsletter for articles that share experiences and best practices around dismantling racism in the mathematics community, and articles that support and promote BIPOC women mathematicians and their work. We welcome submissions in these two areas, including:

- Profiles of BIPOC women mathematicians and their scientific and programmatic accomplishments
- Book reviews for books about antiracism, or books written by BIPOC women mathematicians
- Descriptions of effective processes or actions you or your institution have taken toward antiracism in the mathematical community
- Successes or charges to action directly related to reimagining AWM as an anti-racist organization

Submissions from AWM committees, student chapters, past speakers, and prize winners are encouraged.

Please follow the submission guidelines available by going to <https://awm-math.org/publications/newsletter/>, scrolling down the page and clicking on the plus sign. For items that would be appropriate for one of our columns, sending a query or abstract to the column editor would be appreciated. Although the editorial deadlines are the 24th of odd-numbered months, more lead time to allow for consultation between editors and authors can be very helpful.



The most exciting of my current projects is related to topological phase transitions, the phenomenon of closure and opening of gaps in certain Hofstadter-type structures. This may have some interesting implications. I even started talking to the experimental physicists!

## SIAM 2020 DiPrima Prize

*SIAM, July 2020*

Anna Seigal, now at the University of Oxford, received the Richard C. DiPrima Prize for her dissertation “Structured Tensors and the Geometry of Data,” for which she received her PhD at UC Berkeley. There, her thesis was awarded the Bernard Friedman Memorial Prize in Applied Mathematics. At Oxford, she is a Hooke Research Fellow at the Mathematical Institute and a Junior Research Fellow at The Queen’s College. For information, see <https://sinews.siam.org/Details-Page/july-2020-prize-spotlight#Anna%20Seigal>.

## The 2021–2022 Joan and Joseph Birman Fellowship for Women Scholars

The Joan and Joseph Birman Fellowship for Women Scholars is a mid-career research fellowship specially designed to fit the unique needs of women. The fellowships are open only to women. This fellowship program, established in 2017, is made possible by a generous gift from Joan and Joseph Birman.

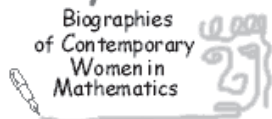
The fellowship seeks to address the paucity of women at the highest levels of research in mathematics by giving exceptionally talented women extra research support during their mid-career years.

The most likely awardee is a mid-career woman, based at a US academic institution, with a well-established research record in a core area of mathematics. The fellowship will be directed toward those for whom the award will make a real difference in the development of their research career. Candidates must have a carefully thought-through research plan for the fellowship period. Special circumstances (such as time taken off for care of children or other family members) may be taken into consideration in making the award. The fellowship can be used to provide additional time for research of the awardee, or opportunities to work with collaborators. This may include, but is not limited to, course buy-outs, travel money, childcare support, or support to attend special research programs. Note that no overhead costs will be covered by this grant.

The award for the 2021–2022 academic year will be in the amount of \$50,000. For further information on the application process, see <http://www.ams.org/programs/ams-fellowships/Birman-fellow>. The application deadline is **December 1, 2020**.

*continued on page 22*

### Essay Contest



To increase awareness of women’s ongoing contributions to the mathematical sciences, the Association for Women in Mathematics holds an annual essay contest for biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers. AWM is pleased to announce that the 2021 contest is sponsored

by Math for America, [www.mathforamerica.org](http://www.mathforamerica.org).

Essays will be based primarily on an interview with a woman currently working in a mathematical career. The AWM Essay Contest is open to students in the following categories: **grades 6–8**, **grades 9–12**, and **undergraduate**. At least one winning entry will be chosen from each category. Winners will receive a prize, and their essays will be published online at the AWM website. Additionally, the essay winning the grand prize will be published in the *AWM Newsletter*. For more information, visit <https://awm-math.org/awards/student-essay-contest/>. The deadline for electronic receipt of entries is **February 1, 2021**. To volunteer to be interviewed, please visit the website <https://awm-math.org/awards/student-essay-contest/> and sign up using the link at the bottom of the page.



## The CMS Launches the Cathleen Syngé Morawetz Prize

*CMS, August 2020*

The Canadian Mathematical Society is pleased to announce the launch of the Cathleen Syngé Morawetz Prize. The Prize is established in honour of the late Canadian mathematician, Cathleen Syngé Morawetz (1923–2017), to reflect the remarkable breadth and influence of her research achievements in pure and applied mathematics.

The Prize is awarded for an outstanding research publication (or a series of related publications) that has had a profound impact on an area of mathematics. It is an annual prize which will rotate between several broadly specified subject areas of mathematics. The recipient shall

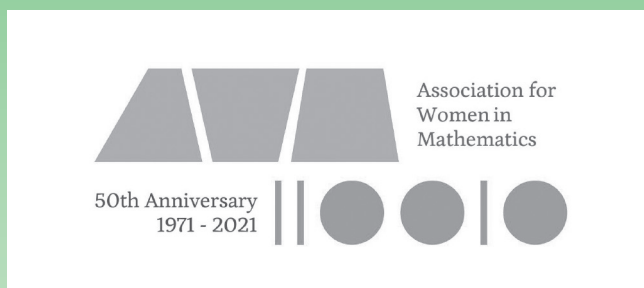
be a member of the Canadian mathematical community. The objective is to broaden the discipline's diversity of the awards given by the CMS.

The Cathleen Syngé Morawetz Prize will be awarded according to the following six-year rotation of subject areas:

Geometry and Topology (2021, and every six years thereafter);  
Combinatorics, Discrete mathematics, Logic and foundations, and Mathematical Aspects of Computer Science (2022, and every six years thereafter);

Applied mathematics, including but not limited to Numerical Analysis and Scientific Computing, Control Theory and Optimization, and Applications of Mathematics in Science and Technology (2023, and every six years thereafter);

Probability and Mathematical Physics (2024, and every six years thereafter);



## Proposals Now Being Accepted for Special Sessions and Panels at the AWM Research Symposium 2021

The 2021 AWM Research Symposium will be held at the Institute for Mathematics and Applications in Minneapolis, MN, June 24–27, 2021, coinciding with the 50th anniversary of AWM. The in-person symposium will showcase the research of women in the mathematical professions, featuring plenary talks, special sessions on a broad range of research in pure and applied mathematics, workshops, panels, and poster sessions for graduate students and recent PhDs. We will postpone until the following year if we believe travel will still be limited in summer 2021.

AWM is now accepting proposals for panels and special sessions at the Research Symposium. A proposal should consist of: a title, summary of the session or panel, and four proposed speakers (the organizer may be one of the speakers). The proposal will also request a statement about how your session supports AWM's commitment to diversity and inclusion, in support of a productive and creative research community. We welcome proposals from any member of the mathematical sciences community on topics in mathematical science research or education.

Please visit <https://www.mathprograms.org/db/programs/1000> to submit by **November 15, 2020**. Note that we will make a determination about postponement before December 31, 2020.

Algebra, Number theory, Algebraic geometry (2025, and every six years thereafter);

Analysis and Dynamic systems (2026, and every six years thereafter).

All of the above fields will be understood most broadly, to ensure that any outstanding publication can be considered under at least one of the categories. A paper (or a series of papers) which has significantly impacted more than one of the listed fields can be nominated more than once during the six-year rotation. The nomination must focus on a single topic, rather than a broad body of work by the nominee.

Cathleen Synge Morawetz was a brilliant Canadian mathematician with a truly remarkable career. She was born in Toronto and did her undergraduate studies at the University of Toronto. She was encouraged to pursue a PhD in Mathematics by Cecilia Krieger (of the Krieger-Nelson Prize). She went to MIT for a master's degree and then obtained her PhD at NYU, where she would spend the bulk of her career, becoming the director of Courant Institute in 1984. Cathleen Synge Morawetz was a recipient of Jeffrey-Williams Prize in 1984 (the only woman to win the Prize), Leroy P. Steele Prize for Lifetime Achievement (2004), George David Birkhoff Prize in Applied

Mathematics (2006), the National Medal of Science, and many other awards and recognitions.

Nominations are currently welcomed for the 2021 Prize, with a deadline of **November 15, 2020**. See <https://cms.math.ca/awards/cathleen-synge-morawetz-prize/nomination-information/>.

## 2021 National Math Festival Will Be Online

<http://www.nationalmathfestival.org/2021-festival/>

The 2021 National Math Festival is moving online! Details are coming soon about events taking place December 2020 through March 2021, plus a concentration of live, interactive online events during the Festival weekend, April 16–18, 2021. Thank you to our presenters for re-confirming their participation. We are excited about bringing you our program!

The National Math Festival brings together some of the most fascinating mathematicians of our time to inspire and challenge participants of all ages to see math in new and exciting ways. The 2021 Festival will feature lectures, hands-on demos, art, films, performances, puzzles, games, children's book readings, and more for all ages.

### CALL FOR NOMINATIONS

## The 2022 AWM-Microsoft Research Prize in Algebra and Number Theory

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

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

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted. Nominations of members of underrepresented minorities are especially welcome. The nomination should include: 1) a one to three page letter of nomination highlighting the exceptional contributions of the candidate; 2) a curriculum vitae of the candidate not to exceed three pages; and 3) three letters supporting the nomination (submitted independently). Nomination materials should be submitted online at [MathPrograms.org](https://mathprograms.org). The submission link will be available 45 days prior to the nomination deadline. Review of candidates will begin in mid-February. For full consideration, nominations should be submitted by **February 1, 2021**. If you have any questions, phone 401-455-4042, email [awm@awm-math.org](mailto:awm@awm-math.org) or see <https://awm-math.org/awards/awm-microsoft-research-prize/>

## In Memoriam

**Susan Fera Assmann** (June 26, 1956–May 30, 2020), lost her courageous battle with cancer at the home she shared with her husband and soulmate, Jeffrey Del Papa of Waltham, MA. She graduated summa cum laude from Dartmouth College in 1978 and earned a PhD in mathematics from the Massachusetts Institute of Technology in 1983 and an MS in biostatistics from the University of Massachusetts School of Public Health, Amherst in 1994. She has an Erdős number of 2.

Susan was a Principal Statistician at HealthCore (formerly New England Research Institute) in Watertown, MA, where she worked for a week shy of 26 years, following a career as a mathematics professor at UMass Lowell and at Regis College in Weston, MA. Susan was the co-author of over 60 scientific publications and her statistical analyses of data from clinical trials will aid many patients.

Susan was an avid reader, a student of the English art of change ringing, an enthusiastic amateur harpsichordist, and an ardent supporter of the early music community in Boston.

**Ruth Roberts Hailperin** of Nazareth, Pennsylvania, died January 15, 2020, three months before her 100th birthday. She earned her PhD in mathematics at the University of Pennsylvania in 1960.

She was co-founder of the 4th Street Meals Center on the South Side of Bethlehem, Professor Emerita of Mathematics at Moravian College, and a World-War II veteran of the United States Army. She was long a member of Central Moravian Church and its choir.

### AWM Will Be \*50\* in 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 will be virtual this year, due to the pandemic. See page 30 for more information about our activities there.

Whether or not the 2021 AWM Research Symposium will be postponed until 2022 will be determined by the end of this year. See <https://awm-math.org/meetings/awm-research-symposium/> for the most up-to-date news. See page 22 for info on submitting a proposal for panels and special sessions.

## ADVERTISEMENTS



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U.S. DEPARTMENT OF ENERGY

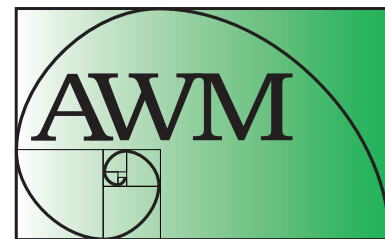
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1/4 page (horizontal)	7 1/8" x 1 7/8"	\$258.50

For further information, see [awm-math.org](http://awm-math.org).



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AWM members get a reciprocal member rate that is 30% less than the regular member rate. And if you join by January 31, 2021, you'll get an additional 25% off your membership when you enter promo code "MBNW21" at check out.

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“SIAM is the premier organization for applied mathematicians and computational scientists representing academia, industry, and government, and serves the community worldwide. SIAM journals are the gold standard and SIAM conferences create and nurture a vibrant network. I am fortunate to serve as SIAM President and am continually impressed with the talent, dedication, and ingenuity of SIAM’s leadership, membership, and staff.”

— Lisa Fauci, SIAM President and Professor of Mathematics, Tulane University, U.S.



8/20

## ADVERTISEMENTS



# ICERM



The Institute for Computational and Experimental  
Research in Mathematics

### ICERM DEPUTY DIRECTOR SEARCH

The Institute for Computational and Experimental Research in Mathematics (ICERM) at Brown University invites applications for the position of Deputy Director, for a term of two to four years beginning as early as July 1, 2021.

ICERM scientific programs are overseen by a Director and two Deputy Directors and assisted by several Associate Directors charged with specific projects or responsibilities. The Deputy Director is a half-time appointment and is expected to be in residence at the institute for half the year.

A Deputy Director should have a Ph.D. and research achievements in mathematics or a related field and is expected to contribute to scientific discussions of programmatic activities and events. Preference will be given to applicants with a scholarly background complementary to the current directors and a broad perspective on research. A courtesy visiting faculty appointment in the appropriate department at Brown will be provided.

Areas of responsibility include 1) overseeing the details of one of the two annual semester programs at ICERM; 2) overseeing some of the additional institute activities: topical workshops, summer undergraduate research program (Summer@ICERM), early career programs, small group research (Collaborate@ICERM), and outreach events; 3) assisting in the solicitation and development of programs and workshops; 4) assisting with grant proposals to support existing and new programs and initiatives, and 5) advising the Director on administrative questions touching on ICERM's scientific activities.



Applicants should submit a cover letter, CV, and names of two references to [director@icerm.brown.edu](mailto:director@icerm.brown.edu). Review of applications will begin November 15 and applications will be accepted until the position is filled. You can find all the details at: <https://www.mathjobs.org/jobs/list/16157>.

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## 2021-2022 MEMBERSHIP

# IAS

INSTITUTE FOR  
ADVANCED STUDY

### PROGRAMS

WOMEN & MATHEMATICS  
[math.ias.edu/wam/2021](http://math.ias.edu/wam/2021)

SUMMER COLLABORATORS  
[math.ias.edu/summercollaborators](http://math.ias.edu/summercollaborators)

### MEMBERSHIPS

The IAS School of Mathematics welcomes applications from mathematicians and theoretical computer scientists at all career levels, and strongly encourages applications from women, minorities, and mid-career scientists (5-15 years from Ph.D.). Competitive salaries, on-campus housing, and other resources are available for periods of 4-11 months for researchers in all mathematical subject areas. The School supports approximately 40 post-docs per year.

In 2021-2022, there will be a special-year program, **h-Principle and Flexibility in Geometry and PDEs**, led by Camillo De Lellis and László Székelyhidi, Jr., Distinguished Visiting Professor; however, Membership will not be limited to mathematicians in this field.

To apply, submit your application at [mathjobs.org](http://mathjobs.org) by December 1, 2020. For more information, please visit: [math.ias.edu](http://math.ias.edu)

DEADLINE:  
DEC. 1, 2020  
[mathjobs.org](http://mathjobs.org)



## ADVERTISEMENTS

### DARTMOUTH COLLEGE

The Dartmouth College Instructorship in Applied and Computational Mathematics is a postdoctoral two- to three-year appointment intended for promising Ph.D. graduates with strong interests in both research related to applied and computational mathematics and teaching. An Instructor should have a research interest in these areas in common with some other member of the Department. Current related research areas are in numerical methods, applied mathematics, complex systems, stochastic processes, network theory, statistical learning, and mathematical biology. Other areas of research in the Department include combinatorics, geometry, logic, noncommutative geometry, number theory, operator algebras, probability, set theory and topology.

Applicants should apply online at [www.mathjobs.org](http://www.mathjobs.org). Position ID: IACM #16173. Applicants received by **January 11, 2021** will receive first consideration. For more information about this position, please visit our website: <https://www.math.dartmouth.edu/activities/recruiting/>.

Dartmouth is highly committed to fostering a diverse and inclusive population of students, faculty, and staff. We are especially interested in applicants who are able to work effectively with students, faculty, and staff from all backgrounds, including but not limited to racial and ethnic minorities, women, individuals who identify with LGBTQ+ communities, individuals with disabilities, individuals from lower income backgrounds, and/or first generation college graduates, and who have a demonstrated ability to contribute to Dartmouth's undergraduate diversity initiatives in STEM research, such as the Women in Science Program, E. E. Just STEM Scholars Program, and Academic Summer Undergraduate Research Experience (ASURE).

Applicants should state in their cover letter how their teaching, research, service, and/or life experiences prepare them to advance Dartmouth's commitments to diversity, equity, and inclusion.

### DARTMOUTH COLLEGE

The Dartmouth College John Wesley Young Instructorship in Mathematics is a post-doctoral two to three-year appointment intended for promising Ph.D. graduates with strong interests in both research related to applied and computational mathematics and teaching. An Instructor should have a research interest in these areas in common with some other member of the Department. Current related research areas are in numerical methods, applied mathematics, complex systems, stochastic processes, network theory, statistical learning, and mathematical biology. Other areas of research in the Department include combinatorics, geometry, logic, noncommutative geometry, number theory, operator algebras, probability, set theory and topology.

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Applicants should apply online at [www.mathjobs.org](http://www.mathjobs.org) Position ID: APAM #16169. Applicants received by **December 15, 2020** will receive first consideration. For more information about this position, please visit our website: <https://www.math.dartmouth.edu/activities/recruiting/>.

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## ADVERTISEMENTS

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The Department of Mathematics at Dartmouth is delighted to announce a senior opening in applied mathematics at the rank of Professor or Associate Professor, with initial appointment as early as 2021-2022, as the Jack Byrne Professor or Associate Professor of Applied Mathematics. In exceptional circumstances we may consider an appointment at the Associate Professor level. A PhD in Mathematics, Statistics, or a related field is required. We seek an acknowledged international leader in applied mathematics with an exemplary track record in creating mathematical and statistical methodological advances and their applications. Current applied and computational interests in the department include complex systems, computational social sciences, image and signal processing, mathematical biology, network analysis, statistical learning, stochastic processes, and uncertainty quantification. Our strength in applied mathematics is complemented by strength in several areas in theoretical mathematics.

This position is part of the larger "Byrne Cluster" comprising two positions in the Department of Mathematics and a recent senior hire in decision sciences in Dartmouth's top-ranked Tuck School of Business. The Byrne Cluster represents a new investment in the department's continued efforts to expand its research efforts and related pedagogy in applied mathematics. We seek a candidate with a demonstrated ability to work across fields and bridge multiple research areas both inside and outside the Department of Mathematics, specifically including the Byrne Cluster member of the Tuck School. The Byrne Cluster comes with programmatic funds to support these interdisciplinary goals. In addition to research qualifications, candidates should have a keen interest and demonstrated excellence in teaching and mentorship of both undergraduates and graduate students.

Applicants should apply online at [www.mathjobs.org](http://www.mathjobs.org) Position ID: APAM #16253. Applicants received by **December 15, 2020** will receive first consideration. For more information about this position, please visit our website: <https://www.math.dartmouth.edu/activities/recruiting/>. Dartmouth is highly committed to fostering a diverse and inclusive population of students, faculty, and staff. We are especially interested in applicants who are able to work effectively with students, faculty, and staff from all backgrounds, including but not limited to racial and ethnic minorities, women, individuals who identify with LGBTQ+ communities, individuals with disabilities, individuals from lower income backgrounds, and/or first generation college graduates, and who have a demonstrated ability to contribute to Dartmouth's undergraduate university initiatives in STEM research, such as the Women in Science Program, E. E. Just STEM Scholars Program, and Academic Summer Undergraduate Research Experience (ASURE). Applicants should state in their cover letter how their teaching, research, service, and/or life experiences prepare them to advance Dartmouth's commitments to diversity, equity, and inclusion.

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**IPAM POSTDOCTORAL SCHOLARS**—The Institute for Pure and Applied Mathematics (IPAM) at UCLA is seeking to recruit up to three Simons Postdoctoral Scholars (SPD) funded by the Simons Foundation. The appointment will be for one calendar year, beginning **August 1, 2021**. A PhD in Mathematics, Statistics, or a related field received in May 2016 or later is required. Women and minorities are especially encouraged to apply. To apply and learn more, go to <https://recruit.apo.ucla.edu/JPF05895>. Applications will receive fullest consideration if received by **January 1, 2021**. UCLA is an equal opportunity/affirmative action employer.

**IPAM ASSOCIATE DIRECTOR**—The Institute for Pure and Applied Mathematics (IPAM) at UCLA is seeking an Associate Director (AD) for a 2-year appointment (renewable for a 3rd year) starting **August 1, 2021**. The AD will be an active member of the team and expected to have research background in mathematics or related fields, with experience in conference organization. The primary responsibility of the AD will be coordinating with the organizing committees to execute IPAM programs. To apply and learn more, go to <https://recruit.apo.ucla.edu/JPF05835>. Applications will receive fullest consideration if received by **February 19, 2021**. UCLA is an equal opportunity/affirmative action employer.

**INSTRUCTOR, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT), CAMBRIDGE, MA**—The Mathematics Department at MIT is seeking to fill positions in Pure and Applied Mathematics, and Statistics at the level of Instructor beginning July 1, 2021 (for the 2021-2022 academic year, or as soon thereafter as possible). Appointments are based primarily on exceptional research qualifications. Appointees will be expected to fulfill teaching duties and pursue their own research program. PhD in Mathematics or related field required by employment start date.

The Department of Mathematics offers supportive mentorship to junior faculty and instructors, an exceptional environment for mathematical inquiry, and a strong commitment to an inclusive, welcoming culture. MIT is an Equal Opportunity, Affirmative Action Employer. All qualified applicants will receive consideration for employment and will not be discriminated against on the basis of race, color, religion, sex, sexual orientation, gender identity, national origin, veteran status, or disability.

For more information and to apply, please visit [www.mathjobs.org](http://www.mathjobs.org). To receive full consideration, submit applications by **December 1, 2020**.

**TENURE —TRACK ASSISTANT PROFESSOR, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT), CAMBRIDGE, MA**—The Mathematics Department at MIT is seeking to fill positions in **Pure and Applied Mathematics** at the level of tenure-track Assistant Professor or higher beginning July 1, 2021 (for the 2021-2022 academic year, or as soon thereafter as possible). Appointments are based primarily on exceptional research qualifications. Appointees will be required to fulfill teaching duties and pursue their own research program. PhD in Mathematics or related field required by employment start date.

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# AWM at Virtual JMM 2021

Register here: [https://jointmathematicsmeetings.org/meetings/national/jmm2021/2247\\_reg](https://jointmathematicsmeetings.org/meetings/national/jmm2021/2247_reg)

See <https://awm-math.org/meetings/awm-jmm/awm-at-jmm-2021-2/> for further information, and to check for updates of the schedule.

**Wednesday, January 6, 2021** AMS-AWM Special Session on Women of Color in Applied Math and Analysis, I  
8:00 a.m. – 10:50 a.m. EST

AWM Panel Discussion Non-traditional Academic Careers in Mathematics  
2:15 p.m. – 3:40 p.m. EST

AMS-AWM Special Session on Women of Color in Applied Math and Analysis, II  
2:15 p.m. – 6:05 p.m. EST

**Thursday, January 7, 2021** AMS-AWM Special Session on Women of Color in Topology and Algebra, I  
8:00 a.m. – 11:50 a.m. EST

AMS-AWM Special Session on Women of Color in Topology and Algebra, II  
1:00 p.m. – 3:50 p.m. EST

Association for Women in Mathematics Panel – *AWM Through the Decades*  
2:30 p.m. – 4:00 p.m. EST

Association for Women in Mathematics Panel – *Fairness and Bias in Mathematics*  
4:30 p.m. – 6:00 p.m. EST

**Friday, January 8, 2021** AWM Workshop Poster Presentations by Women Graduate Students and Reception  
3:45 p.m. – 5:00 p.m. EST

Association for Women in Mathematics Business Meeting  
5:00 p.m. – 5:30 p.m. EST

Association for Women in Mathematics Awards Presentation  
5:30 p.m. – 7:00 p.m. EST

**Saturday, January 9, 2021** AWM Workshop on Women in Analysis (WoAN)  
8:00 a.m. – 5:05 p.m. EST

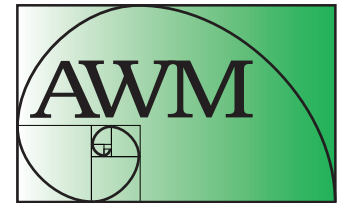
Other sessions of interest include: MAA Contributed Paper Session on The EDGE (Enhancing Diversity in Graduate Education) program: Pure and Applied talks by Women Math Warriors, I and II, Friday, 9:00 a.m. – 11:55 a.m. and 1:00 p.m. – 2:55 p.m. and MAA Contributed Paper Session on Promoting Women in Mathematics, I, II, and III, Wednesday, 8:00 a.m. – 10:55 a.m. and 2:15 p.m. – 4:50 p.m., Saturday, 9:00 a.m. – 10:55 a.m.

# 2020–2021 Individual Membership Form

**JOIN ONLINE at [www.awm-math.org](http://www.awm-math.org)!**

Please fill in this information and return it along with your dues to:

AWM Membership, PO Box 40876, Providence, RI 02940



**ASSOCIATION FOR  
WOMEN IN MATHEMATICS**

PO Box 40876  
Providence, RI 02940  
401.455.4042

<http://www.awm-math.org>  
[awm@awm-math.org](mailto:awm@awm-math.org)

Last Name \_\_\_\_\_ First Name \_\_\_\_\_ M.I. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State/Province \_\_\_\_\_

Zip/Postal Code \_\_\_\_\_ Country \_\_\_\_\_

AWM's membership year is from October 1 to September 30. Please fill in this information and return it along with your dues to: AWM Membership, PO Box 40876, Providence, RI 02940

The AWM Newsletter is published six times a year. If you have questions, contact AWM at [awm@awm-math.org](mailto:awm@awm-math.org), 401.455.4042, or visit our website at: [www.awm-math.org](http://www.awm-math.org).

E-mail: \_\_\_\_\_ Home Phone: \_\_\_\_\_ Work Phone: \_\_\_\_\_

## PROFESSIONAL INFORMATION:

Position: \_\_\_\_\_

Institution/Company: \_\_\_\_\_

City: \_\_\_\_\_ State/Province: \_\_\_\_\_ Zip/Postal Code: \_\_\_\_\_ Country: \_\_\_\_\_

If student, check one:

Graduate  Undergraduate

If not employed, leave position and institution blank.

**DEGREES EARNED:** Degree(s) Institution(s) Year(s)

Doctorate: \_\_\_\_\_

Masters: \_\_\_\_\_

Bachelors: \_\_\_\_\_

## INDIVIDUAL DUES SCHEDULE

Please check the appropriate membership category below. Make check or money order payable to: Association for Women in Mathematics.

NOTE: All checks must be drawn on U.S. banks and be in U.S. funds. AWM membership year is October 1 to September 30.

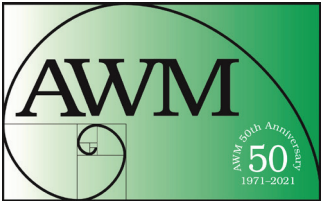
- Regular individual membership (*new members only*) ..... \$35
- Regular individual membership ..... \$70
- Regular membership (*3 year membership*) ..... \$210
- Family membership ..... \$35  
*please indicate family member who is a regular member of AWM: \_\_\_\_\_*
- Contributing membership (*includes designation of a free student membership*) ..... \$160
- Contributing membership (*3 year membership*) ..... \$480
- Retired or Part-time employed or KWMS Affiliate or AWM-SIAM Reciprocity (*circle one*) ..... \$30
- Student or unemployed membership (*circle one*) ..... \$20
- Outreach membership ..... \$10
- Contribution to the AWM annual giving campaign ..... \$ \_\_\_\_\_
- Contribution to the AWM Mary and Alfie Gray Award for Social Justice. .... \$ \_\_\_\_\_
- Contribution to the AWM Alice T. Schafer Prize fund ..... \$ \_\_\_\_\_
- Contribution to the AWM Anniversary Endowment fund ..... \$ \_\_\_\_\_
- I do not want my name to appear in annual lists of contributors to AWM's funds.

Please note that all student, unemployed, outreach, family, and KWMS affiliate members and members with non-US addresses receive only the electronic version of the newsletter.

If you wish to receive a print version, please check here

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ASSOCIATION FOR  
WOMEN IN MATHEMATICS

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**ASSOCIATION FOR WOMEN IN MATHEMATICS**

Volume 50, Number 6, November–December 2020

**ADDRESS CORRECTION FORM**

- Please change my address to:
- Please send membership information to my colleague listed below:
- No forwarding address known for the individual listed below (enclose copy of label):  
*(Please print)*

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Country (if not U.S.) \_\_\_\_\_ E-mail Address \_\_\_\_\_

Position \_\_\_\_\_ Institution/Org. \_\_\_\_\_

Telephone: Home \_\_\_\_\_ Work \_\_\_\_\_

**MAIL TO:**

AWM  
PO Box 40876  
Providence, RI 02940

**or E-MAIL:**

[awm@awm-math.org](mailto:awm@awm-math.org)