

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

A colleague on AWM's Executive Committee recently wondered who people think about when they say "the AWM." Is it me, as President? Is it Darla Kremer and Samantha Faria, as our two paid employees? Is it the Executive Committee? Is it the 200+ regular committee members who perform most of the work of the organization? Is it the several hundred volunteers beyond that who do things like essay contest judging, student chapter organizing, or EvenQuads bio writing? Is it the membership? Is it some or all of these?

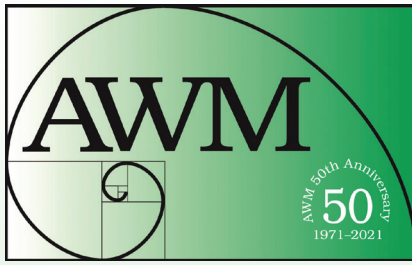
Because of AWM's extensive programming, many people do not realize that we have only 1.75 ongoing paid staff positions. AWM, like other organizations such as Spectra and NAM that were developed to address inequities in mathematics, depends almost entirely on volunteers. AWM projects move forward when people in the math community are enthusiastic enough about them to donate their time and expertise consistently until the project comes to fruition. Sometimes these projects come from AWM leadership (the Executive Director (ED) and the Executive Committee (EC)), but they also often come from members who have a fantastic idea and enough energy to bring it to life.

In other words, I'm inclined to say that the AWM is its members. Each one of you has power to shape the future of the organization, whether or not you are elected to a leadership role. And those of you who are or will be in a leadership role, either on the EC or on a committee, have even more ability to shape who we are and where we are going. Of course, the EC and ED have a responsibility to create a climate and organizational structure that facilitates expressions of our members' power, something we take quite seriously and continually work to improve. But I encourage each of you to recognize what power you do have, and use it to create the best organization we can be. Don't hesitate to reach out if you have an idea you'd like us to consider.

Prize nominations. At the AWM panel of past presidents at JMM 2021, Kristin Lauter characterized genius as talent plus fame, and suggested that women are not seen as geniuses because of an absence of fame. I am fairly skeptical of the concept of genius (even though I know some), especially the way it is wielded in mathematics and academia, but I strongly support the idea that we need to highlight the extraordinary work that many of our women and BIPOC men are doing. One way to do so is to nominate people you admire for prizes.

Having been on several committees where awards are determined, I can tell you that the same people are nominated over and over again for different awards. These are often faculty and students at institutions with 2–2 teaching loads and below,

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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*

who have the time to gain visibility and to find someone to nominate them, and/or whose colleagues have time to think about who they might nominate. Meanwhile, excellent work at other institutions goes unrecognized because prize deadlines come and go while we are swirling in the tornado of the academic year or the deadlines of our industry workplace. Being intentional about which awards you want to target can help. Having a clear idea of when award nominations are due and creating a timeline for the nomination can help. Serving on review committees for those awards can help.

AWM has a committee that puts forth ideas for women nominees for math prizes in other societies. Additionally, past presidents—especially Lauter herself—work together to assemble nomination packets for women. I urge each of you to follow suit. For example, suggest names to AWM at awm@awm-math.org. Or gather a small group of people and commit to working together to nominate people every year for a few prizes. Or make a personal pledge to do so on your own. At the very least, send us an email with the name of someone you'd like our prize nomination committee to consider—it only takes a few seconds and can make a tremendous difference in someone's life.

Women and the gender spectrum. At our May EC meeting, Juliette Bruce from Spectra gave a presentation about gender identity and expression and how a gender-based organization such as AWM might work to support mathematicians from other marginalized gender identities. Bruce suggested that we (a) educate ourselves about gender identities and challenges they face (for example, distance from conference rooms to the nearest gender neutral bathroom), (b) think carefully about what we assume to be true about certain gender identities (for example, not all pregnant people are women) and (c) be clear about who our events are meant to support and then provide that support (for example, don't advertise that folks from all marginalized genders are welcome and then run a session for cisgender women). We will continue to discuss these issues and look at how AWM is or is not succeeding in these areas and in our mission to support all women in mathematics. In the meantime, I encourage our membership to think about these ideas for their own events and programming, and to attend one of the many events that Spectra will be organizing at JMM 2022.

AWM 50th anniversary. We are almost halfway through our 50th year! The 50th Anniversary Committee has done an amazing job of organizing AWM's We Speak Series. Speakers so far include Erika Camacho, Moon Duchin, Talithia Williams, Gioia de Cari, and Carla Cotwright-Williams (who is on our EC). Upcoming speakers will be Erica Walker and Eugenia Cheng. All talks are recorded and posted on the website: <https://awm-math.org/50th-anniversary/we-speak-series/>. Check out these amazing women and the excellent work they are doing!



**You can renew
your membership
at awm-math.org**

Research Symposium. Our plan to host our biennial research symposium during the year of our 50th anniversary was thwarted by the pandemic since we postponed the symposium until June 2022. We will still throw ourselves a birthday party, though, and we hope you can join us. If you'd like to propose a workshop or session, you have until September 15, 2021 at this portal: <https://www.mathprograms.org/db/programs/1000>. We look forward to seeing your brilliant ideas!



Kathryn Leonard

Kathryn Leonard
May 24, 2021
South Pasadena, CA

PRESIDENTS' REFLECTIONS

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

This is the sixteenth 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.

Cathy Kessel was the eighteenth president of AWM (2007–2009). For more about Kessel, see https://works.bepress.com/cathy_kessel/.

On being an AWM member, an education consultant, and an AWM president

Cathy Kessel

In 2005, when I was asked to be AWM president-elect, I was astonished. I doubted that I was respectable enough to be president. Unlike previous presidents, I didn't have a regular job, just a lot of consulting gigs—and my past academic positions were not particularly distinguished. Moreover, I thought of my work as “odd jobs in math education” as I wrote in 2005,¹ not mathematics, although mathematics played an important role. Because my post-graduate activities shaped my later attitudes and actions as president, I begin with a brief summary of my life after I left the traditional academic path.

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¹ See my two-part article in the March–April and May–June 2004 *AWM Newsletter*, <https://www.drivehq.com/folder/p8755087/1748807765.aspx>, <https://www.drivehq.com/folder/p8755087/1748808262.aspx>.

Membership Dues

Membership runs from Oct. 1 to Sept. 30

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Family, new member, and reciprocal

(first two years): \$35

Affiliate, retired, part-time: \$30

Student, unemployed: \$20

Outreach: \$10

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

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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.

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



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

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AWM DEADLINES

RCCW Proposals: July 1, 2021
and January 1, 2022
AWM Workshop at JMM:
August 15, 2021
AWM-AMS Noether Lecture:
October 1, 2021
AWM-MAA Falconer Lecturer:
October 1, 2021
AWM-SIAM Sonia Kovalevsky Lecture:
October 1, 2021
AWM Alice T. Schafer Prize:
October 1, 2021
AWM Dissertation Prize:
October 1, 2021
Ruth I. Michler Memorial Prize:
October 1, 2021
AWM Travel Grants: October 1, 2021
and February 1, 2022
AWM Workshop at SIAM:
November 15, 2021

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PRESIDENTS' REPORT *continued from page 3*

In 1989, after three years as an assistant professor at a small college, I had gone to Berkeley, then quit my job.² I spent time at the Graduate School of Education (GSE) at the University of California where I was able to audit courses, and began to understand some of the behaviors that had so troubled me with respect to teaching and to gender. Being at the GSE was also an opportunity to watch studies in mathematics education develop. Two especially memorable ones were studies of teacher knowledge and of success and failure among African American middle school students.

In contrast with my graduate school experience, I began to acquire mentors. Often, the term “mentor” is associated with teaching and guidance, but as the pairing “mentor and protégé” suggests, an important aspect of mentoring is knowing the protégé’s talents and making appropriate recommendations of the protégé for talks, scholarships, and, in my case, odd jobs in math education. This was a huge contrast with my graduate school experiences in mathematics as were shared practices at the GSE: a “first-year project” which requires starting to do research early; help and encouragement to give talks at professional meetings and to publish while in graduate school. (These practices were a revelation to me then, but, I hope, nothing special now.)

The San Francisco Bay Area was a hotbed of math education organizations, many started in the 1970s. One was the Math/Science Network which sponsored Expanding Your Horizons (EYH) conferences, career days for middle- and high-school girls held across the US and beyond.³ I became a board member and got involved in editing and proofreading its newsletter and the materials that were sent to the EYH sites every year by the sole staff person, a part-time executive director. I also joined the Support Committee for Jenny Harrison (which, despite its name, was a 501(c)(3) organization like AWM) composed of academics, activists, and activist academics, with no paid staff. (Harrison, a mathematician, sued the University of California (UC) for sex discrimination.⁴) That and other sex discrimination cases at Berkeley, throughout the UC system, and around the US⁵

² My December 1990 *UME Trends* article, “Why I Quit My Job,” gives some reasons, <https://mathedck.files.wordpress.com/2010/03/kessel-ume-trends-article-1990.pdf>. I recognized the student attitudes described by Neal Koblitz in his September–October 1990 *AWM Newsletter* article “Are Student Ratings Unfair to Women?” <https://www.drivehq.com/folder/p8755087/1748752929.aspx>.

³ For some history, see <https://techbridgegirls.org/index.php?id=467> and <https://berkeleysciencereview.com/2020/05/an-accidental-activist-part-2/>.

⁴ In addition to articles and letters to the editor of the *AWM Newsletter*, see Selvin et al., “Does the Harrison Case Reveal Sexism in Math?,” *Science* 252, 1781 (1991); Selvin, “Jenny Harrison Finally Gets Tenure in Math at Berkeley,” *Science* 252, 286 (1993). Harrison was far from alone in suing for tenure denial at Berkeley. At the law school, Marjorie Shultz and Eleanor Swift were denied tenure in 1985 and 1987, respectively, and sued. As the result of a settlement, they were granted tenure reviews (and awarded tenure) by independent panels in 1989; see *California Magazine*, <https://alumni.berkeley.edu/california-magazine/fall-2020/swift-justice-berkeley-law-historic-fight-for-gender-equality>. Harrison, who had filed suit in 1986, had asked for the same independent panel process to be used—and it was—in 1993.

⁵ See Margaret Rossiter’s *Women Scientists in America: Forging a New World Since 1972* and AAUW’s *Tenure Denied: Cases of Sex Discrimination in Academia*, <https://www.aauw.org/app/uploads/2020/02/TenureDenied.pdf>.

inspired the founding of WAGE (We Advocate Gender Equity) whose mission was “To end gender bias and achieve gender equity in the education, hiring, retention, promotion, and compensation of women in the academic community within the University of California and other academic institutions.” Like the Support Committee, it had no paid staff, and as with the Math/Science Network, I was on its board and helped to edit its newsletter.

As a result, I became a lot better at going to meetings and reading agendas, began to appreciate the type of skill involved in running a meeting, and learned something about how small organizations keep going. (A tiny staff may not be able to fulfill every request and should not be stretched thin by trying. Volunteers are very important! So is institutional memory.)

Although I dropped off the standard academic track in 1989, I had not lost contact with the mathematical community. In the same year, I wrote my first book review for the *AWM Newsletter*, then became the book review editor. That, along with committee work and other service allowed me to get a sense of what AWM did and a chance to discuss ideas encountered at the School of Education with mathematicians. At the same time, I tried to think of ways to build bridges between mathematicians and researchers in education and social science: Facilitating exchange of relevant information by passing it along myself, suggesting people for AWM’s Education Committee, inviting social scientists to give talks in sessions at the Joint Meetings, and expanding the travel grants program to encourage interactions

between mathematicians and researchers in education and related fields such as psychology and sociology.

As president-elect, my interests in mathematics education and gender converged when I worked on the background for a petition to remove Camilla Benbow from the National Math Panel in 2006. In 1980 and 1983, Benbow and her co-author Julian Stanley had published articles in *Science* that reported dramatic gender differences in “mathematical reasoning ability,” as measured by SAT scores given to non-random samples of middle-school students. The 1980s findings were often interpreted as evidence of innate ability in males in media accounts⁶ and were widely circulated and cited, by Lawrence Summers, among others.⁷ Later use of the same (shaky) methods had produced less dramatic findings that Benbow, a prolific author, had neglected to mention. In 2007, an article co-authored by Benbow cited

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⁶E.g., “Are Boys Better at Math?,” *New York Times*, December 7, 1980; AWM statement on p. 1 of the March–April 1981 *AWM Newsletter*, <https://www.drivehq.com/folder/p8755087/1748722736.aspx>.

⁷In 2005, Summers (an economist) was president of Harvard and (via Steven Pinker’s book *The Blank Slate*) used the Benbow–Stanley findings as a basis for speculations that received much publicity. For a more thorough discussion, see “Gender, Culture, and Mathematics Performance,” *Proceedings of the National Academy of Sciences*, <https://www.pnas.org/content/pnas/106/22/8801.full.pdf?sid=76b8d>.

CALL FOR PROPOSALS

Research Collaboration Conferences for Women

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

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

More information about Research Collaboration Conferences for Women, existing RCCW networks, and related initiatives can be found at <http://awm-math.org/programs/advance-research-communities/>.

the less dramatic findings, which began to trickle into the writings of other authors.⁸

As president, I focused on helping AWM run. In contrast with most of my previous board experiences, AWM had many programs and a staff, which at that time consisted of a half-time executive director and half-time managing director with some office help. (From my viewpoint that was a large staff, but it was (and is) quite small as compared with those of AMS, MAA, or SIAM. For example, AWM now has 1.75 full-time staff members. In contrast, AMS has over eight times as many members and an executive staff of 7, plus other staff members for government relations, education, finance, publishing, sales, meetings, etc.)⁹

I was lucky to start my term as president after Jennifer Quinn had gained experience as executive director, and again lucky that Maeve McCarthy was her successor. Both had creative ways of dealing with problems and constraints. I got a lot of practical advice about organizations from Jennifer Lewis, the managing director. For example, consider the costs of adding a new award. Aside from any cash awarded, staff time is needed: someone must ask people to serve on the selection committee, answer questions from nominators (and sometimes the selection committee), handle nominations, notify the winner, get a press release or citation checked, get a plaque or certificate made, update the website, etc.

Before becoming president, I had served on the Long-range Planning Committee, which with the aid of a consultant had developed a strategic plan to restructure AWM's governance and operations. Among other things, this involved the initiation of four "portfolios" (Policy and Advocacy, Meetings and Programs, Membership, and Fundraising) chaired by members-at-large in the second half of their four-year terms. To allow that, the number of members-at-large expanded from five to eight in 2006, while my predecessor Barbara Keyfitz was president. The Executive Committee (EC) and the four portfolio committees met in alternate months.

In my opinion, the strategic plan was designed to accommodate the change from being an organization in which the president was still quite hands-on, for example, populating award selection committees without the aid of a Committee on Committees. (As I write this, I have a vivid

⁸ In 2006, I wrote about these findings in the *AWM Newsletter* and *Focus*; see <https://www.drivehq.com/folder/p8755087/1751134571.aspx> and <http://www.maa.org/pubs/december06focus.pdf>. In 2011, I wrote about these and other questionable statistics in the *Journal of Humanistic Mathematics*, <http://scholarship.claremont.edu/jhm/vol1/iss2>.

⁹ <https://www.ams.org/about-us/executive-staff/org-chart.pdf>.

memory of Maeve McCarthy initiating a Committee on Committees meeting at a JMM.) The role of the EC also changed. Instead of going immediately to the EC, proposals for new activities first went to the appropriate portfolio committee for vetting and discussion, then were presented to the EC.¹⁰

In my last months as president, I had the opportunity to work on a proposal from the Association for Women in Science called Advancing Ways of Awarding Recognition in Disciplinary Societies (AWARDS).¹¹ This built on an earlier project that had collected statistics on awards given to women in STEM¹² and was intended to inform disciplinary societies about ways to reduce bias. At that time, because "bias" was confined to gender bias and most AWM awards were for women, AWM didn't have the opportunity to examine its awards as part of the project. However, AWM helped in obtaining agreements to participate from MAA, SIAM, AMS, and ASA and was represented at the AWARDS workshops.

It seems to me that search and hiring committees are often told "best practices" without rationales for using them. (Another problem is the term "best practices." How can one know if a practice is best without testing all possible practices?) I think that one strength of the AWARDS workshops was the sessions conducted by the University of Wisconsin's Women in Science & Engineering Leadership Institute (WISELI) that presented research findings about biases along with methods to reduce those biases, rather than simply labeling such methods "best practices."¹³ In addition to reducing gender bias in awards from these societies, I hoped that methods such as use of a canvassing committee (helping to increase nominee diversity) and spending sufficient time reviewing each applicant (helping to reduce cultural, racial, ethnic, and gender bias in selection) might infiltrate other arenas: for example, departmental hiring and AWM's procedures for awards.

¹⁰ The Policy and Advocacy Committee—one of these portfolios—years later gave rise to the Government Advocacy Committee, sponsor of the Capitol Hill visits.

¹¹ For a brief description of AWARDS, see Leboy and Popejoy's abstract for their 2012 JMM talk: http://jointmathematicsm meetings.org/amsmtgs/2138_abstracts/1077-00-1439.pdf. AWIS resources developed for AWARDS include: <https://www.insightintodiversity.com/improving-recognition-through-awards-how-to-mitigate-bias-in-awards/>; https://awis.site-ym.com/page/Awards_webcasts.

¹² <http://raiseproject.org/>.

¹³ Connections between findings on a given form of bias and methods for reducing it are illustrated in the AWARDS webcasts and in WISELI's short booklet on reviewing applicants: https://wiseli.wisc.edu/wp-content/uploads/sites/662/2018/10/BiasBrochure_3rdEd.pdf.

My thoughts about AWM's future extend what I've already mentioned: building more ties with PreK–12 teachers;¹⁴ helping to improve education (PreK to postdoc), mentoring, research, and careers; extending consciousness of bias and knowledge of ways to avoid or counteract it. In my view, these involve building connections with people outside mathematics (e.g., psychologists and sociologists) as well as inside mathematics, both for exchange of information and for projects and activities.

Support of such efforts, in my opinion, relies on AWM's infrastructure and institutional memory. AWM has been extremely fortunate in having energetic and longstanding volunteers. But we are a small organization with

¹⁴ Recently, I often think of Pat Kenschaft's article, "Racial Equity Requires Teaching Elementary School Teachers More Mathematics," <https://www.ams.org/notices/200502/fea-kenschaft.pdf>.

a small membership. As the vibrant AWM ecosystem of conferences, awards, research support, Hill visits, and student chapters has grown,¹⁵ so have demands on staff time. Although the budget and staff time have grown along with the organization, it often seems that there is never quite enough of either. So, one of my wishes for AWM's future is more income for more staff time, whether from donations, sponsors, or new memberships. From that, I hope we can build not only institutional memory in staff as well as in volunteers, but also reinforce institutional practices that consistently counter bias, helping AWM to become a more welcoming and inclusive organization, and strengthening mathematics by allowing mathematical interest and talent to be better recognized and nurtured.

¹⁵ I have adopted and adapted Judy Roitman's lovely description in her reflection.

AWM Slate Announced!

We are pleased to announce the slate for this fall's AWM election. **Talitha Washington** (Clark Atlanta University and Atlanta University Center) has been nominated to serve as President-Elect. **Alejandra Alvarado** (Eastern Illinois University) has been nominated to serve as Clerk. **Kim Ayers** (Carroll College), **Emma D'Aniello** (Università degli Studi della Campania Luigi Vanvitelli), **Susanna Fishel** (Arizona State University), **Rebecca Garcia** (Sam Houston State University), **Courtney Gibbons** (Hamilton College), **Carly Klivans** (Brown University), **Priya Prasad** (University of Texas, San Antonio), and **Shanise Walker** (University of Wisconsin, Eau Claire) have accepted nominations for Member-at-Large; four will be elected.

Nominations by petition signed by 15 members are due to our president by **September 1, 2021**. We give our thanks to the Nominating Committee (Hélène Barcelo, Raegan Higgins, Dave Kung, Ami Radunskaya (Chair), Suzanne Sindi, and Aris Winger)!

Ruth I. Michler Prize

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

A \$50,000 prize will be awarded to a woman, recently promoted to associate professor or the equivalent, for a semester of mathematical research without teaching obligations in the Mathematics Department of Cornell University.

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

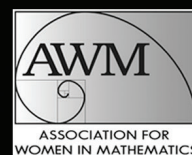
The application deadline is October 1 for the award to be used during the 2022–2023 academic year.



www.awm-math.org/michlerprize.html



Cornell University



Bonita V. Saunders Named 2021 AWM-MAA Falconer Lecturer

In recognition of her distinguished contributions to mathematics and mathematics education as well as her skill in delivering an expository lecture, the Association for Women in Mathematics and the Mathematical Association of America are pleased to announce that the 2021 Etta Zuber Falconer Lecturer will be Dr. Bonita Saunders of the National Institute of Standards and Technology (NIST).

Saunders earned a BA in mathematics from the College of William and Mary, an MS in mathematics from the University of Virginia Charlottesville and a PhD in computational and applied mathematics from Old Dominion University. Her research interests include numerical grid generation, visualization of complex functions data, numerical software for special functions, and the numerical solution of partial differential equations.

Saunders is a research mathematician in the Applied and Computational Mathematics Division (ACMD) at the NIST. She is the Visualization Editor and principal designer of graphs and visualizations for the NIST Digital Library of Mathematical Functions (DLMF), and Project Leader for the DLMF Standard Reference Tables on Demand Project, a collaborative effort between ACMD and the University of Antwerp Computational Mathematics Research Group to develop a software testing system that generates certifiably accurate tables of special function values at user specified precision.

Throughout her career, Saunders has received a host of awards honoring her many accomplishments. In 2011 she received the US Department of Commerce Gold Medal and in 2017 the NIST Information Technology Laboratory Outstanding Contribution Award for Excellence in Technical Leadership. In 2019 she was elected a Fellow of the Washington Academy of Sciences and honored for Excellence in Research Mathematics and Computer Science.

She is an active member of MAA, SIAM, AMS, and NAM. She is currently the MD-DC-VA Section Representative to MAA Congress, an associate editor of MAA *Mathematics Magazine*, and a member of the SIAM Board of Trustees.



Bonita V. Saunders
Photo courtesy of Lifetouch Photography

She served on the Selection Committee for the AWM-MAA Etta Zuber Falconer Lecture from 2004 to 2009 and on the MAA BIG Committee from 2012 to 2017.

At MathFest 2021, Saunders will speak on “Complex Functions, Mesh Generation, and Hidden Figures in the NIST Digital Library of Mathematical Functions.” The DLMF replaces the National Bureau of Standards *Handbook of Mathematical Functions* and currently contains more than 600 2D and 3D figures and over 200 interactive 3D web visualizations of high level mathematical function surfaces that users can explore. The talk will include some interesting historical tidbits, as well as past and present challenges during the development of the DLMF’s graphics content.

MathFest 2021 will be held virtually August 4–7. The Falconer lectures were established in memory of Etta Zuber Falconer (1933–2002). Her many years of service in promoting mathematics at Spelman College and efforts to enhance the movement of minorities and women into scientific careers through many forums in the mathematics and science communities were extraordinary. Falconer lecturers are women who have made distinguished contributions to the mathematical sciences or mathematics education.

Renew your membership at awm-math.org.

STUDENT CHAPTER CORNER

Coordinator: Emek Köse, student-chapters@awm-math.org

Call for Creative Ideas for Joint Project

Shanna Dobson, chair, AWM-MAA Liaison Committee

I am delighted to announce a forthcoming project jointly hosted by the AMW-MAA Liaison and AWM Student Chapter Committees scheduled for the 2021–2022 academic year. Consider this announcement one of imagineering. We wish to invite all AWM Student Chapters to participate in a new national competition that is cooperative and globally inclusive in its essence. The idea is to build community nationally by amplifying and showcasing our creativity in mathematics. A project will be announced, and chapters will

work together to complete the task by the deadline in the announcement and showcase their results both nationally, at our MathFest 2022 awards ceremony, and locally at their MAA Sectionals.

To that end, we are putting forth a call for creative ideas for possible projects. Any creative ideas will be considered, so please be as imaginative as you like. The project chosen will be announced at the AWM Facebook page on November 15.

Ideas we have so far for the project are: design a pair of quiet VTOL devices; write and perform a 10-minute musical about women in mathematics; write and perform a short play about female mathematicians; deliver a Three Minute Thesis as a poem/song/dance; design a mathematics curriculum for Jupiterians (inhabitants of Jupiter).

Please contact Shanna Dobson at awm-maa@awm-math.org or Emek Köse at student-chapters@awm-math.org with your wonderful ideas for projects! For full consideration, we need to receive them by **November 1**.

CALL FOR NOMINATIONS

The 2023 Noether Lecture

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

The mathematicians who have given the Noether lectures in the past are: Jessie MacWilliams, Olga Taussky Todd, Julia Robinson, Cathleen Morawetz, Mary Ellen Rudin, Jane Cronin Scanlon, Yvonne Choquet-Bruhat, Joan Birman, Karen Uhlenbeck, Mary Wheeler, Bhama Srinivasan, Alexandra Bellow, Nancy Kopell, Linda Keen, Lesley Sibner, Olga Ladyzhenskaya, Judith Sally, Olga Oleinik, Linda Rothschild, Dusa McDuff, Krystyna Kuperberg, Margaret Wright, Sun-Yung Alice Chang, Lenore Blum, Jean Taylor, Svetlana Katok, Lai-Sang Young, Ingrid Daubechies, Karen Vogtmann, Audrey Terras, Fan Chung Graham, Carolyn Gordon, Susan Montgomery, Barbara Keyfitz, Raman Parimala, Georgia Benkart, Wen-Ching Winnie Li, Karen E. Smith, Lisa Jeffrey, Jill Pipher, Bryna Kra, and Birgit Speh. The 2022 lecturer will be Marianna Csörnyei.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be an additional letter of support. Nominations of members of underrepresented minorities are especially encouraged. The letter of nomination should include a one-page outline of the nominee's contribution to mathematics, giving four of her/their most important papers and other relevant information. Nominations are to be submitted as ONE PDF file via [MathPrograms.Org](https://mathprograms.org). The submission link will be available 45 days prior to the deadline. Nominations must be submitted by **October 1, 2021** and will be held active for three years. If you have questions, phone 401-455-4042, email awm@awm-math.org or see the website <https://awm-math.org/awards/noether-lectures/>

BOOK REVIEW

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

When Women Didn't Count: The Chronic Mismeasure and Marginalization of American Women in Federal Statistics, by Robert Lopresti, Praeger, 2017. ISBN-13: 978-0440843686

Reviewer: Barbara Lee Keyfitz, The Ohio State University

This book examines a question you might have pondered: To what extent can one trust the accuracy of reports produced by the Bureau of the Census and other federal agencies whose task it is to tell Americans how many people live in the country, what are their jobs, and what are their demographic characteristics like age, gender, marital status, and number of children. The 2020 census was concluded a few months ago, and we have all seen considerable commentary on the low probability that it is anywhere close to accurate. In fact, there is evidence, based on news reports and on statements by the Commerce Department (the home department of the Bureau), that this census count has been deliberately distorted for political ends. Based on the examples detailed in *When Women Didn't Count*, this is nothing new. Inaccurate data, regarding women in particular, seems always to have found its way into official government documents.

By tracing the history of some of these “mismeasures,” Lopresti lays the groundwork for a fascinating analysis of how social expectations and political calculations have influenced the US census from its inception to the present. Reading this book, one learns that Lopresti is not the first person to have asked about the federal government's policies regarding data on women; he quotes at length other scholarly works on “statistics on women.” His findings are meticulously documented: There are 43 pages of notes and a 44-page bibliography.

Lopresti, who recently retired as a faculty member and librarian at Western Washington University, is an authority on government documents. He points out that one could do equally revealing studies of inaccuracies in data about race, disability, or many other identifying characteristics. But for the AWM community, this study is particularly interesting because it traces how changing perceptions of women have distorted the stories told, through data, about women.

Before getting into the story, let me insert my own perspective here. My background includes a close relationship with the Dominion Bureau of Statistics (now called Statistics

Canada), the Canadian counterpart of the US Bureau of the Census. My father worked there for 23 years, beginning as a census clerk in 1936 and rising to the rank of Dominion Statistician before leaving for academia in 1959. And I had summer jobs there, the summer before I started college in 1962 and the summer after that. My first summer job was delightful. I was assigned to a division that calculated cost of living allowances for Canadians posted abroad. My task was to convert units of measurement and currency for a “market basket” of groceries and household items in different countries and to come up with an estimate of their cost, relative to the same items in Canada. The lists I was given were compiled by the envoys and their staffs, and their quality varied considerably. But the objective was to come up with a number, and one that didn't seem too unreasonable. By the second summer I worked there, data from the 1961 census was being compiled, and I was part of a group of eight young women who had the task of copying by hand tables from computer printouts of data and turning them over to typists who would typeset them for the final census reports. We had all passed some sort of exam to qualify us for this job; we were also qualified to know what an incredibly stupid make-work project this was, as we proofread our copied tables by reading them to each other. The bright spot was that with eight people we could make up two tables of bridge at our lunch breaks.

Statistics Canada has the advantage over the Bureau of the Census that it is not mandated by the Constitution, and therefore is somewhat less influenced by politics. For example, its head is a civil service appointment, not a political one. And it is possible, though not mentioned specifically by Lopresti, that some of the “marginalization” of women in the early days of the US census was due to the fact that women did not vote and, to some extent, were interesting to the government only as they contributed to the head count. So, the early census tabulators identified by name only one person in the household (always male, if possible) and gave merely the head count of the other members of the household. This lack of interest in the women of a household seems to have resulted in much inaccuracy (inferred by observing inconsistencies from census to census). Once women got the vote in 1919, the census paid more attention to the women of a household, and inconsistencies decreased.

The complicated history of the term “head of household” is detailed in *When Women Didn't Count*. This classification provides an example of a phenomenon repeated throughout this book. During the period when this term was used, so that census enumerators, who until 1960 went door-to-door and obtained answers to the census questions

by interviewing whoever happened to be home at the time, had to put a name there, the expectation was that the head of the household was male. In fact, that became the rule, so that if a female name was recorded, it would be changed, by fiat, to a male name where possible. If an enumerator reported some unusual data, such as a woman head of household, their report would be marked for further examination. The enumerator would have to spend time justifying their conclusion and explaining that it was not an error. Since workers were paid by the piece, this extra time meant a loss of wages, and enumerators were motivated not to record unusual data. Of course, there is no proof that enumerators deliberately shaped their reports to conform to the expectations of the day, but it has been noted by other researchers cited by Lopresti.

The story unwinds in similar ways in other categories. When certain occupations are regarded as rare or “unsuitable” for women, few women are reported in them. When the social climate changes, the number “suddenly” increases. Single mothers received short shrift in the past. If there were children in the household, women were expected to produce evidence of the man who was responsible for them. The recorded number of single mothers increased dramatically when non-judgmental language to describe them was introduced. The chapter on “gainful employment” is particularly striking, and relevant to today’s controversies concerning the value of work done in keeping house and raising children. The term seems to have been first used in reports on the 1870 census. This was a time when it would have been difficult to maintain many middle-class households without servants. Servants were paid, and remuneration through wages was one criterion for gainful employment. Many women were classified as “keeping house,” but their numbers were not included in the census bureau’s Table of Occupations. Needless to say, despite the definition of “gainful,” prostitution did not make it onto the list of gainful occupations for women.¹

Lopresti’s treatment is meticulous. Additional parts document the treatment of women’s health, both as it concerns

¹ Women who were keeping house or attending school were considered to be employed, but not gainfully so. The Superintendent of the bureau suggested that the following categories of women were to be found among the unemployed: “grown daughters living at home, widowed mothers supported by their children, ladies living upon the income of accumulated property, as well as women of the pauper, vagrant, and criminal classes.” [See Remarks on the Table of Occupations, 659–661, *The Statistics of the Population of the United States*, Francis A. Walker, Superintendent of Census, Washington: Government Printing Office, 1872.]

specific issues connected with childbearing and general medical issues, such as excluding women from clinical trials, and questioning whether breast cancer screening ought to be covered by Medicare. There is a chapter on data on crime, and a chapter on data on women in the military. Much of these data were collected by specialized federal offices within different departments (for example, the Bureau of Justice Statistics, created in 1979, is located in the Justice Department). There are 127 federal agencies with statistical responsibilities, including, for example, the FBI. The lack of centralization means that figures on a particular topic compiled by different offices may be inconsistent. While such discrepancies do not necessarily reflect bias, they do make it more difficult to trust the numbers.

When Women Didn’t Count is organized into eight parts, each with between two and five chapters. There are two parts concerned with women’s work, the first on the question, discussed earlier in this review, of what of the things that women do counts as “work.” The second focuses on two federal offices, the Bureau of Labor Statistics and the Women’s Bureau. Here Lopresti documents, in depressing detail, how politics affects not only what is counted and how, but how we find out about it. In the early 2000s, for example, publications from the Women’s Bureau with titles like *Don’t Work in the Dark—Know Your Rights* disappeared from its website. This appeared to reflect an insensitivity to issues facing women in the labor force. I will not report which political party appeared to be behind this. You may guess. However, it was the *other* party, I learned to my dismay, that terminated a valuable publication called the *Statistical Abstract of the United States*, an annual snapshot of data the federal government thought we Americans should know about ourselves.

Each chapter follows a topic from the beginning of the Republic to the present day, a narrative that can be a bit unnerving. Despite the grim subtitle and the continuing fluctuations in attitudes about women’s place in the body politic, there has been a steady increase in sensitivity to the fact that women constitute more than half of the occupants of this country and that women’s experiences are not merely a footnote to grand narrative of men’s contributions. One may laugh or grimace about how bad things were in the past while still recognizing that there is room for improvement.

The structure of this book does not make for cover-to-cover reading. It produces an effect from relentless documentation. A reader, somewhat exhausted by over twenty chapters that ring the changes on this history, is not

continued on page 12

likely to emerge with a question like, “I wonder why the book says nothing about such-and-such.” (Although this reader, trying to find the reference to something she thought she’d read, was frustrated by the index, which may be organized on principles familiar to librarians, but didn’t have entries for the words that I remembered reading.)

My parents liked to tell a story from my childhood. When I was a toddler, parenting advice emphasized, as it does now, the importance of reading to your small children. The advice then included a statement that it didn’t matter much what the parent was reading; what the child got from the interaction was the experience of contact with the parent, and of feeling the parent’s attention devoted to the

child. In fact, the advice said, the parent could read from the telephone directory (let me suppose the readers of this review remember what a telephone directory is) and it would be completely satisfactory. My father, always eager to be up-to-date, tried it out. With me sitting comfortably beside him for a bedtime story, he pulled out the Ottawa telephone book (white pages) and got started. After a few seconds, my parents told me, I trotted off and returned half a minute later with *The Pokey Little Puppy*. That was the end of the phone book. From an adult viewpoint, the telephone directory tells a different, and valuable, story, and it would be pointless to urge that it be reorganized to be more readable or charming. The content of *When Women Didn’t Count* justifies its structure, and beyond its explicit topic, draws attention to the dangers of politicizing data. That part of the story continues.

CALL FOR NOMINATIONS

The 2022 Kovalevsky Lecture

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

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

The lectureship may be awarded to anyone in the scientific or engineering community whose work highlights the achievements of women in applied or computational mathematics. Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be an additional letter of support. Nominations of members of underrepresented minorities are especially encouraged. The nomination must be accompanied by a written justification and a citation of about 100 words that may be read when introducing the speaker. Nominations are to be submitted as ONE PDF file via MathPrograms.Org. The submission link will be available 45 days prior to the deadline. Nominations must be received by **October 1, 2021** and will be kept active for two years.

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

AWM WORKSHOP AT THE 2022 JOINT MATHEMATICS MEETINGS

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

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

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

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

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

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

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

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

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

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

MEDIA COLUMN

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

WIMM Watch: A Hidden Figure in *Stitchers*

Sarah J. Greenwald, Appalachian State University

The science fiction series *Stitchers* focuses on using a living human “stitcher” plus technology in order to enter into the memories of people who are recently deceased. In the finale “Maternis” (S3 E10, original airdate 8/14/2017), Commander Denise Nichols, played by the actress Louisa Abernathy, has died of natural causes at the age of 84. She is introduced as a mathematician and American hero. The team later hypothesizes that Nichols would have calculated space trajectories at NASA in the early 1970s. I believe this is a nod to *Hidden Figures* (the movie had been released in January of 2017). Nichols’ work ties into the plotline. As of the date of this writing, the entire series is freely available at <https://www.freeform.com/shows/stitchers>.

EDUCATION COLUMN

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

Moving Towards Data Science in K–12

Anna Bargagliotti, Department of Mathematics, Loyola Marymount University; Anna Gralnik, 5th Grade Teacher, Aurelia Pennekamp Elementary School

In 2020, this column discussed the report *Pre-K–12 Guidelines for Assessment and Instruction in Statistics Education II: A Framework for Statistics and Data Science Education (GAISE II)* (Bargagliotti, Franklin, Arnold, Gould, Johnson, Perez, & Spangler, 2020; Bargagliotti, 2020). The report presents a set of recommendations towards data acumen at the school level across three levels (A, B, and C) roughly corresponding to elementary, middle, and high school.

A podcast by Steve Levitt (2019), co-author of *Freakonomics*, prompted a movement to include data science in the school curriculum that has taken off. Levitt said:

I believe that we owe it to our children to prepare them for the world that they will encounter—a world driven by data. Basic data fluency is a

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 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.**

requirement not just for most good jobs, but also for navigating life more generally, whether it is in terms of financial literacy, making good choices about our own health, or knowing who and what to believe.

Driven by the digital revolution, data are now readily available to help us gain insights and make recommendations on how to deal with world issues, empowering students with tools for social critique and social action (Oakes et al., 2018, p. 5). We are in a critical time for the development of data literacy. Students need to gain the ability to understand data, to use data to arrive at plausible and reasonable decisions based on the data available, and to interrogate what the data is representing. For example, as students investigate data, do they see themselves represented in the data? Who is included? Who is excluded? Does the data hold a particular bias? What is illuminated in the absence of data?

The *GAISE* report offers a blueprint forward for statistics and data science education in K–12 schooling.

Over the past year, there have been more calls for the K–12 curriculum to include data science from Departments of Education across different states. Several states are undergoing frameworks and standards revisions and including data science as part of their curriculum. For example, California is in the process of approving new frameworks to include data science (<https://www.cde.ca.gov/ci/ma/cf/>) and

the state of Georgia is approving a set of state standards that includes much more attention to data science and statistics than previous standards (<https://www.georgiastandards.org/Georgia-Standards/Pages/Math.aspx>). While this push to place data science in the K–12 curriculum has been important and significant, it is still unclear how it will play out in the curriculum. Will it become an “alternate pathway” course for high school students or be well-integrated into the curriculum in all of K–12?

As data literacy is a basic requirement for being able to participate in an educated manner in today’s society, students really need to have data science and statistics be an important part of their curriculum throughout all grades. While it seems to be more common for people to be able to envision how to do data science with high school students and beyond, meaningful data science can be done with young students as well.

In this article, we describe an example of what data science could look like in the elementary grades and discuss some important principles of data science at the elementary level. The following example was carried out with a fifth grade class in California via online synchronous teaching during the COVID-19 pandemic.

Data Science in the Early Grades

Climate change is one of the most important challenges of our generation. Students need time to grapple

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CALL FOR NOMINATIONS

The Association for Women in Mathematics Dissertation Prize

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

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

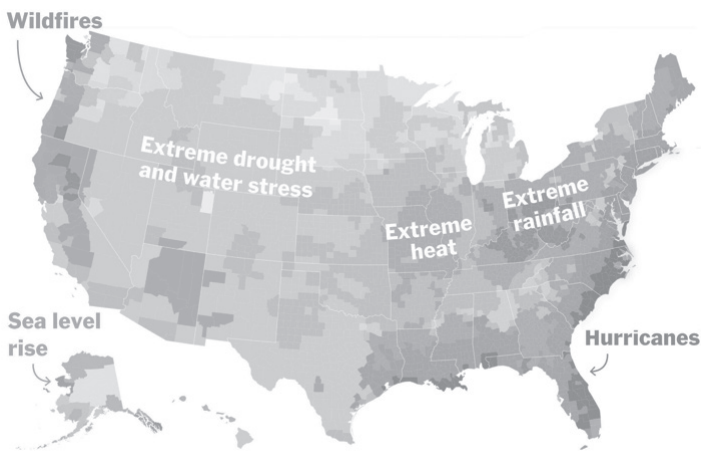
Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted. Nominations of members of underrepresented minorities are especially encouraged. The nomination should include: 1) a one to three page letter of nomination highlighting the exceptional mathematical research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

with and reflect on this issue in order to understand the implications for their generation. Anna Gralnik (co-author of this article), a 5th grade teacher in California, designed a two-week cross-disciplinary investigation of climate change for her 5th grade class. She posed an open-ended question to the class: *What are typical climate challenges that affect your community?*

Gralnik had students engage in an inquiry process that provided students the opportunity to reflect on insights they discovered from the multiple data sources they investigated over the course of one week. As part of the lesson students read articles and opinion pieces, wrote an essay, and participated in a debate.¹

Data Talk. The “What’s Going on With This Graph?” collaboration between the *New York Times* (NYT) and the American Statistical Association (ASA) focuses on getting students to understand data visualizations and complex multi-dimensional data. Each week a graphic used in a NYT article is presented and students are asked to notice and wonder about the graphic. It is important to note that the context of the graph is described and the citation for the original graph is given. The source of the data used to create the graph is always traceable and the graphs are always timely, current, and relevant.

The following graph/map was presented to the 5th grade class:



Reprinted by permission of the *New York Times*. Created by Stuart A. Thompson and Yaryna Serkez, graph titled “What to call climate change where you live” from “Every Place Has Its Own Climate Risk. What Is It Where You Live?” published 9/18/2020, NYT. Copyright 2020 The New York Times Company.

¹ See Gralnik & Bargagliotti (in press) for a more detailed description of this lesson.

To understand the source, students were guided to the original article presenting the map in the NYT: <https://www.nytimes.com/interactive/2020/09/18/opinion/wildfire-hurricane-climate.html>.

The original article cites that the data came from Four Twenty Seven (<http://427mt.com/>), a company that focuses on assessing climate risk on financial markets. The data for the map was taken from their report: <http://427mt.com/wp-content/uploads/2018/05/427-Muni-Risk-Paper-May-2018-1.pdf>

It is very important for students to learn to check the source and whether it is reputable. Reputable sources have citations. The source must describe their data collection process and any limitations of the data. Data collection and study design is an advanced and extremely important part of statistics which is often glossed over while teaching statistics at all levels. However, as data science takes off in schools, checking data sources becomes more important than ever. Secondary data are being collected constantly throughout our daily lives (e.g., Amazon clicks, pictures we take with our phones, Tweets people share, photos people share, locations where we are), so understanding how data are collected and questioning the data becomes imperative. It is critical to examine data science instruction as it relates to purpose, value, and student engagement. Young students need to develop the practice of checking sources when drawing conclusions or making any assertions. This process should not be undervalued or skirted over.

Gralnik’s class was asked to study the map and answer the following questions in small groups:

- What do you see on this graph?
- What do you notice?
- What do you wonder?
- What impact does this have on you and your community?

Students were encouraged to understand the different variables that are presented in the data visualization to see that the map graphically displays three variables simultaneously:

1. type of environmental risk (a six category variable represented by the grayscale²)
2. severity of risk (a continuous variable represented by the intensity of the grayscale)
3. location (represented by the map itself)

² The links to the graphical displays in the *New York Times* will connect to the color versions of the maps.

This data talk encouraged students to research a larger social issue (climate change) in their community, looking at common themes through a collaborative process. The impact of data talks is enhanced by the authentic questions and investigations that students generate while collaborating with their peers. Students learn not only from the teachers but from their own research and from one another (Parkay et al., 2014).

Interactive Map. After reflecting on the static map, the 5th grade students were presented with the interactive version of the map found here: <https://www.nytimes.com/interactive/2020/09/18/opinion/wildfire-hurricane-climate.html>

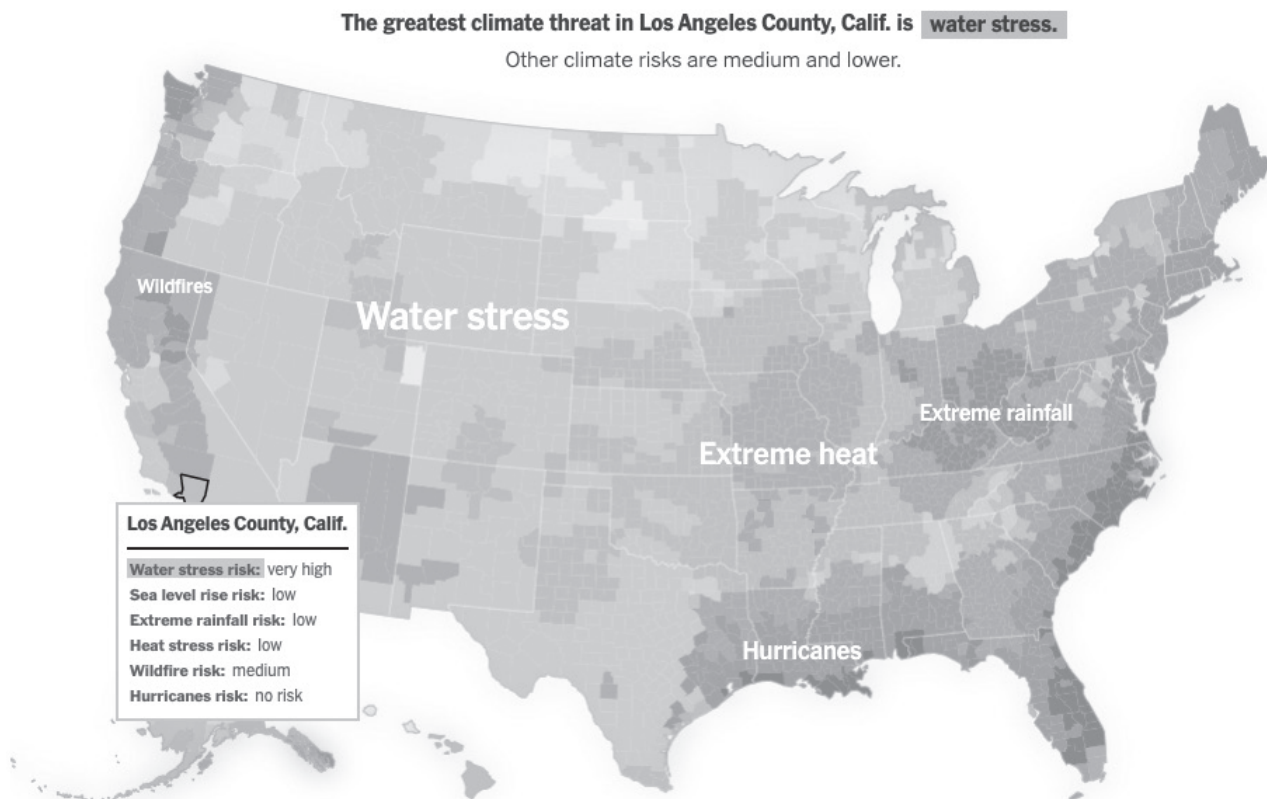
Using the interactive map, students could research further how environmental risk is affecting various communities. For example, students could hover over specific counties to discover how that county fares for each of the risk categories. Also, students will discover that the severity of risk, graphed as the darkness/lightness of the color, is a categorical variable with very high, high, medium, low, and no risk categories.

The new era of data science often presents us with opportunities to engage with data through an interface such as an interactive map; thus, students need to become accustomed to working with data in this manner.

Data Set Creation. As a last step, Gralnik asked her class to create their own data set based on the interactive map. Students were divided into groups and were assigned 10 counties in California. Using the interactive map, they created a data set that showed the risk level for each different type of threat by county (see figure on the next page for an example).

Students were then asked to make sense of the data without any specific directions or requirements on how to do this. Students tallied the risks into a table, some groups made graphical displays, others discussed specific risks, etc. As an example, consider one group's work where they made a table counting the number of counties that were categorized as having each of the risk levels from the data they collected. For example, there were four counties that had a risk level High for Extreme Rainfall.

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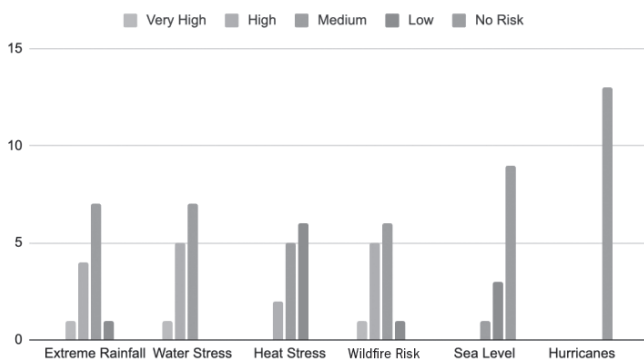
Reprinted by permission from the *New York Times*. Created by Stuart A. Thompson and Yaryna Serkez, graph titled "What to call climate change where you live" from "Every Place Has Its Own Climate Risk. What Is It Where You Live?" published 9/18/2020, NYT. Copyright 2020 The New York Times Company.

	Extreme Rainfall	Water Stress	Heat Stress	Wildfire Risk	Sea Level	Hurricanes
Sierra	Medium risk	high	low	very high	no risk	no risk
Siskiyou	Medium risk	high	low	high	no risk	no risk
salona	Medium risk	medium	medium	medium	low	no risk
sonoma	Medium risk	medium	medium	high	low	no risk
Stanislaus	Medium risk	high	medium	medium	no risk	no risk
Sutter	Medium risk	medium	high	medium	no risk	no risk
Tehama	High risk	medium	low	high	no risk	no risk
Trinity	High risk	medium	low	high risk	No risk	no risk
Tulare	Very high risk	Medium	High	Low	Low	no risk
Tuolumne	Medium risk	High risk	Low risk	High risk	No risk	no risk
Ventura	Low risk	Very high risk	Low risk	Medium risk	Medium risk	no risk
Yolo	High risk	Medium	Medium	Medium	No risk	no risk
Yuba	High risk	High	Medium	Medium	No risk	no risk

	Extreme Rainfall	Water Stress	Heat Stress	Wildfire Risk	Sea Level	Hurricanes
Very High	1	1	0	1	0	0
High	4	5	2	5	0	0
Medium	7	7	5	6	1	0
Low	1	0	6	1	3	0
No Risk	0	0	0	0	9	13

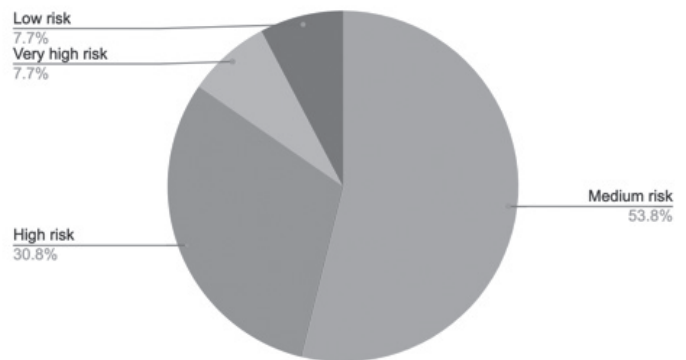
The same group was then able to create graphical displays to help them understand the severity of the risks in the counties they were assigned. Bar graphs and pie charts were created by the students in Excel.

RISKS

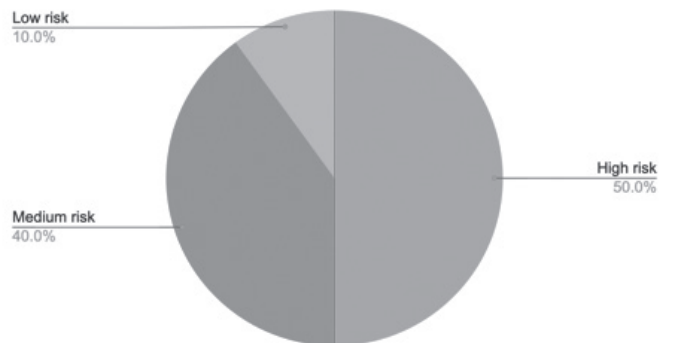


Using these data, students were able to construct arguments and support for their answers about how climate change is affecting the counties they studied, using science concepts related to climate change as a way to see and experience their lives in new and meaningful ways (Pugh et al., 2011).

Extreme Rainfall



Wildfire



Reflections

As we move towards including data science in the curriculum, here are some basic principles of working with data that are particularly relevant:

1. Students can work with primary and secondary data sets starting at early ages. Students must be encouraged to describe their data collection methods for primary data sets and check data collection methods for secondary data sets in order to understand limitations and validity of the results.
2. Multivariate thinking should be encouraged from early ages. Students can work with multiple variables starting in elementary school.
3. Data visualizations should be encouraged. Data visualizations should help people make sense of data and highlight patterns in data. Students should work on creating data visualizations with multiple variables represented.
4. Students should grow accustomed to working with data in interactive ways through different interfaces.
5. Students should grow accustomed to communicating and making arguments using data.

While these five points do not constitute an exhaustive list of data science principles that students should be working on, they serve to connect to the elementary example provided in this article. The GAISE II report provides further elaboration related to data science and statistics at the school level.

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The Mary and Alfie Gray Award for Social Justice

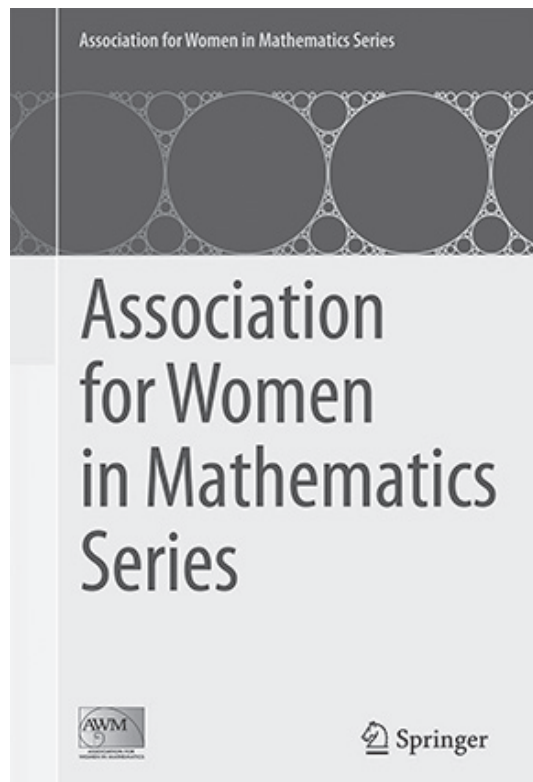
The Executive Committee of the Association for Women in Mathematics has approved the Mary and Alfie Gray Award for Social Justice to reward the vigorous and imaginative application of the mathematical sciences to advancing the cause of social justice, defined as promoting a just society by challenging injustice and valuing diversity. Social justice exists when all people share a common humanity and therefore have a right to equitable treatment, support for their human rights, and a fair allocation of community resources.

The award is named after Mary Gray, Founder and Past President of AWM, who has lived her life fighting for social justice and human rights, and for Alfred Gray, who was devoted to working with mathematicians from around the world, and with students from underrepresented groups within the United States. The Grays have always been concerned about securing human rights and equitable treatment in the profession and by governments. The award will be made every other year (subject to availability of funds) at the AWM reception at the Joint Mathematics Meetings and comes with a cash prize of \$1000.

Please help the AWM make this award possible by donating to the Prize Fund through the AWM secure portal: <https://ebus.awm-math.org/ebus/Default.aspx?TabID=1523>

Roundup of Recent AWM Springer Series Volumes

Dahlia Fisch, Springer



The AWM series published by Springer is still flourishing, with the addition of three new recent volumes. As with all titles in the series, the works were peer-reviewed to meet the highest standards of scientific literature, while presenting topics at the cutting edge of pure and applied mathematics, as well as in the areas of mathematical education and history. Information on all three can be found below, and they're all available for purchase on Springer.com.

Vol. 21: *Advances in Mathematical Sciences: AWM Research Symposium*, Houston, TX, April 2019, Bahar Acu, Donatella Danielli, Marta Lewicka, Arati Nanda Pati, Saraswathy Ramanathapuram Vancheeswara, Miranda Teboh-Ewungkem (Eds.): This volume highlights the mathematical research presented at the 2019 AWM Research Symposium held at Rice University, April 6–7, 2019. The symposium showcased research from women across the mathematical sciences working in academia, government,

and industry, as well as featured women across the career spectrum: undergraduates, graduate students, postdocs, and professionals. The book is divided into eight parts, opening with a plenary talk and followed by a combination of research paper contributions and survey papers in the different areas of mathematics represented at the symposium

Vol. 22: *Using Mathematics to Understand Biological Complexity*, Rebecca Segal, Blerta Shtylla, Suzanne Sindi (Eds.): This volume tackles a variety of biological and medical questions using mathematical models to understand complex system dynamics. Working in collaborative teams of six, each with a senior research mentor, researchers developed new mathematical models to address questions in a range of application areas. Topics include retinal degeneration, biopolymer dynamics, the topological structure of DNA, ensemble analysis, multidrug-resistant organisms, tumor growth modeling, and geospatial modeling of malaria. The work is the result of newly formed collaborative groups begun during the Collaborative Workshop for Women in Mathematical Biology hosted by the Institute of Pure and Applied Mathematics at UCLA in June 2019. Previous workshops in this series have occurred at IMA, NIMBioS, and MBI.

Vol. 23: *Research in Mathematics and Public Policy*, Mary Lee, Aisha Nájera Chesler (Eds.): This volume presents research inspired by the first workshop for Women in Mathematics and Public Policy, held January 22–25, 2019 at the Institute for Pure and Applied Mathematics and the Luskin Center at the University of California, Los Angeles. The workshop was created to promote and develop women at all levels of their careers as researchers in this area, and focused on how mathematics can be used in public policy research and was designed to foster collaborative networks for women to help address the gender gap in mathematics and science. The idea was modeled after other successful Research Collaboration Conferences for Women, where junior and senior women come together at week-long conferences held at mathematics institutes to work on pre-defined research projects.

The book features a variety of research projects at the intersection of mathematics and public policy, specifically falling in the areas of cybersecurity and climate change, two broad and impactful issues that benefit greatly from mathematical techniques. Each chapter is a mathematical look into a specific research question related to one of these issues, an approach that offers the reader insight into the application of mathematics to important public policy questions.

In Memoriam

Marion Ilse Walter (1928–2021)

by Marie A. Vitulli

Dr. Marion Ilse Walter, mathematics educator, prolific author, beloved teacher, and dedicated mentor of students, passed away at home in Eugene, Oregon, on May 9, 2021. Marion was born in Berlin, Germany in 1928 into a Jewish family. In March of 1939, Marion and her older sister, Ellen, were sent on a *Kindertransport*, to England. The *Kindertransport*, or Children's Transport, was organized nine months before World War II broke out and sent nearly 10,000 primarily Jewish children from Nazi Germany and other nearby countries to the United Kingdom. Marion and Ellen Walter left by train from Berlin, traveled to Holland, and from there crossed the English Channel, ending up at Eastbourne. The sisters were moved to several locations in England between 1939 and 1944, after England entered the war and it appeared that Eastbourne might be along the path of a possible German invasion. Marion ended up in Combermere Abbey in Cheshire, where she completed her schooling at the age of sixteen and was asked to stay on as a math teacher.

Marion's parents escaped to the United Kingdom later in 1939. Her father Willy was interned on the Isle of Man, where he died in 1943. Marion, Ellen, and their mother, Erna, emigrated to the United States in 1948. Ellen returned to England to get married. Marion and her mother remained in New York City, where Marion completed her undergraduate studies at Hunter College and graduated with a bachelor's degree in mathematics in 1950. She held various teaching positions over the years. She continued her education, at New York University for her master's degree in mathematics (1954) and at Harvard Graduate School of Education for her EdD in mathematics education (1967). Between earning her master's degree and doctorate, Marion spent nine years (1956–1965) at what was then Simmons College. She created the math major at Simmons, founded the math department there, and taught and mentored many students who would become life-long friends. One of those students was Lenore Blum, former AWM President and distinguished career professor of computer science at Carnegie Mellon University.

While working with Geometer's Sketchpad with a colleague in 1993, Marion observed what was later named



Marion Ilse Walter

Marion Walter's Theorem or simply Marion's Theorem: when the sides of any triangle are trisected and lines are drawn from the trisection points to the opposite vertices, the area of the central hexagon is one-tenth the area of the original triangle. There have been various proofs of this theorem since 1993.

Marion published over 40 journal articles, several children's books, and the well-regarded book *The Art of Problem Posing*, which was co-authored by Stephen I. Brown and aimed at a teaching audience. *The Art of Problem Posing* was first published in 1983 and is now in its third edition. Marion and Stephen started their long-time collaboration during their student days at Harvard. Two of Marion's children's books, *Make a Bigger Puddle*, *Make a Smaller Worm* and *The Mirror Puzzle Book*, received honorable mentions from the New York Academy of Science Children's Book Award Program.

I met Marion in 1977 when she arrived at the University of Oregon as an associate professor; I had come the year before as an assistant professor, fresh out of graduate school. Until a few years ago, Marion and I were the only women to be granted tenure in the mathematics department. Indeed, during most of my career, we were the only tenure-related women in the department. When Marion was put up for tenure the university committees thought

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her file was so strong that they not only recommended tenure but recommended promoting her to full professor. We were colleagues and good friends, who supported and applauded each other over the years.

Marion always said that she never really grew up. She had a child-like fascination with all sorts of things: hub caps, sewer covers, flowers, and symmetries in almost everything. She had extensive photo collections of some of these things as well as a collection of photos of famous mathematicians, which is now the Marion Walter Collection at the Archives of American Mathematics. She

delighted in entertaining children with number games and mirrors. One year, she told me and my partner, Sarah, that she had never dyed Easter eggs, but wanted to. We bought everything needed to dye eggs and invited Marion over to our house. We all had a wonderful time and Marion created some special eggs. Marion frequently requested to be taken out for pizza. One time she whispered to the young woman at the counter that she wanted anchovies and pineapple on her pizza. I guess she knew that I would be aghast.

Marion lived with multiple sclerosis for many years, but this didn't slow her down until the last year or two. Marion was an exceptional person, a truly unique individual. I will always remember her and I will dearly miss her.

Announcements

Introducing the 2021 Karen EDGE Fellows

Rhonda Hughes, for The EDGE Foundation

The EDGE Foundation is delighted to announce the 2021 Class of Karen EDGE Fellows. The Karen EDGE Fellowship Program was established with a generous gift from Karen Uhlenbeck on the occasion of her 2019 Abel Prize. The Fellowships are designed to support and enhance the research programs and collaborations of mid-career mathematicians who are members of an underrepresented minority group. The 2021 Fellows were selected on the basis of their excellent research programs and their plans to use the funds for enhancing those programs through collaboration and travel. The Karen EDGE Fellows for 2021 are Emille Lawrence, University of San Francisco, and Manuel Rivera, Purdue University.

Emille Davie Lawrence received her PhD in mathematics from the University of Georgia in 2007, under the direction of Will Kazez and Clint McCrory. She was an undergraduate at Spelman College. She was a postdoctoral fellow at the University of California, Santa Barbara and subsequently joined the faculty of University of San Francisco, where she has taught since 2011. She is currently term associate professor and serves as department chair. Emille's research is in spatial graph theory, a branch of geometric topology in the intersection of knot theory and graph theory.

Manuel Rivera received his BA in mathematics from the Massachusetts Institute of Technology and his PhD in



Manuel Rivera



Emille Davie Lawrence

2015 under the direction of Dennis Sullivan at CUNY Graduate Center. He was a CNRS Postdoctoral Researcher at the Institut de mathématiques de Jussieu Paris-Rive Gauche, was a Research Assistant Professor at University of Miami and CINVESTAV, and is currently assistant professor at Purdue University. The overarching goal of Manuel's research is to understand the algebraic nature of geometric space using the ideas and tools of algebraic topology.

Applications Open for New Claytor-Gilmer Fellowship

AMS, May 2021

Applications are now open for the Claytor-Gilmer Fellowship, created by the American Mathematical Society (AMS) to further excellence in mathematical research and to help generate wider and sustained participation by Black mathematicians. The application deadline is **July 25, 2021** for this inaugural fellowship. The recipient may use it in the 2021–2022 academic year or defer to 2022–2023.

One award will be conferred annually in the amount of \$50,000. The most likely awardee will be a mid-career Black mathematician, based at a US institution, whose achievements demonstrate significant potential for further contributions to mathematics. Awardees may use the fellowship in any way that most effectively enables their research—for instance, for release time, participation in special research programs, travel support, childcare, etc.

The fellowship honors Dr. William Schieffelin Claytor and Dr. Gloria Ford Gilmer, who made significant contributions to mathematics scholarship and could have accomplished even more were it not for the racism they faced.

William Schieffelin Claytor, PhD (1908–1967) was the first African American man to publish a research article in a peer-reviewed mathematics journal, with a paper on topology in the *Annals of Mathematics*. He was the third African American to earn a PhD in mathematics (University of Pennsylvania, 1933). He earned undergraduate and master's degrees in mathematics at Howard University. After his PhD, he taught at West Virginia State College where one of his students was Katherine Johnson (of *Hidden Figures* fame). Claytor's passion for research was diminished by racist attitudes and incidents. This history is recounted in an AMS report (see <https://www.ams.org/about-us/understanding-ams-history>). Claytor spent the majority of his career at Howard University where he also became department chair. He is recognized by the National Association of Mathematicians (NAM) in their annual Claytor-Woodard Lecture at the Joint Mathematics Meetings.

“I want to thank the American Mathematical Society for acknowledging my father for his contributions to the mathematical community. I'm sure if he were alive, he would've appreciated and celebrated this recognition for his hard work,” wrote Melody Claytor, Claytor's daughter. “It is an honor to see my father's passion for mathematics lead to

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CALL FOR NOMINATIONS

Alice T. Schafer Mathematics Prize

The Executive Committee of the Association for Women in Mathematics calls for nominations for the Alice T. Schafer Mathematics Prize to be awarded to an undergraduate woman for excellence in mathematics. All members of the mathematical community are invited to submit nominations for the Prize. The nominees may be at any level in their undergraduate careers, but must be undergraduates as of October 1, 2021. They must either be a US citizen or have a school address in the US. The Prize will be awarded at the AWM Reception and Awards Presentation at the January 2022 Joint Mathematics Meetings in Seattle, WA.

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

ANNOUNCEMENTS *continued from page 23*

the creation of this fellowship that will help ignite so many brilliant minds. The Claytor family is grateful to this organization for its role in keeping my father's legacy alive."

Gloria Ford Gilmer, PhD (1928–) is the first African American woman to have published mathematics research articles in peer-reviewed journals, with papers on differential equations in the *Proceedings of the AMS* and the *Pacific Journal of Mathematics*. Ford Gilmer earned her undergraduate degree from Morgan State University and taught at six different HBCUs after earning a master's degree in mathematics from the University of Pennsylvania. Later in life she earned a doctorate in curriculum and instruction from Marquette University. She was the first Black woman on the board of governors of the Mathematical Association of America (MAA) and also served as a research associate with the US Department of Education. A leader in the field of ethnomathematics, she was the second person and the first woman to give NAM's Cox-Talbot Lecture.

Jill Gilmer, Ford Gilmer's daughter, said of her mother, "Her impact went beyond mathematics. I have heard her students remark that excelling in math gave them

the confidence to succeed in other aspects of their life as well.... She helped them believe in themselves and their dreams."

Ford Gilmer's son, Jay Gilmer, added, "I am very excited that the American Mathematical Society has chosen to honor my mother and preserve her legacy by naming a fellowship after her. This fellowship will assure that her work will continue indefinitely."

Ron Buckmire, Associate Dean for Curricular Affairs and Professor of Mathematics at Occidental College, and Julie Mitchell, Director of the Biosciences Division at Oak Ridge National Laboratory, led a subcommittee of mathematicians that recommended naming the fellowship for Claytor and Ford Gilmer.

"Claytor and Ford Gilmer had two of the most compelling stories of all the people we considered," Buckmire said. "Both graduates of HBCUs, they had significant mathematical research careers that were negatively impacted by lack of support from the mathematics community in general and from the AMS in particular."

The creation of the fellowship was proposed in summer 2020 and was also recommended by the AMS Task Force on Understanding and Documenting the Historical Role of

CALL FOR NOMINATIONS

The 2022 Etta Zuber Falconer Lecture

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

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

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be at least one additional letter of support. Nominations for members of underrepresented minorities are especially encouraged. The letter of nomination should include an outline of the nominee's distinguished contributions to the mathematical sciences or mathematics education and address the nominee's capability of delivering an expository lecture. Nominations are to be submitted as ONE PDF file via MathPrograms.Org. The submission link will be available 45 days prior to the deadline. Nominations must be submitted by **October 1, 2021** and will be held active for two years. If you have questions, phone 401-455-4042, email awm@awm-math.org or visit <https://awm-math.org/awards/falconer-lectures/> to learn more.

the AMS in Racial Discrimination (see <https://www.ams.org/about-us/understanding-ams-history>) as part of broader efforts by the AMS to redress discriminatory practices and promote full and equitable participation in mathematics.

In January 2021, the AMS Council officially created the new fellowship. The next month, a subcommittee formed to produce recommendations for the fellowship name. The subcommittee included members of the AMS's Committee on Equity, Diversity & Inclusion (CoEDI), led by Buckmire, the AMS's Committee on the Profession (CoPROF), led by Mitchell, and other prominent Black mathematicians.

AMS governance officially approved the name of **Claytor-Gilmer** for the fellowship in the spring of 2021. The annual award joins two other AMS fellowships: the Centennial Fellowship and the Joan and Joseph Birman Fellowship for Women Scholars. Beginning in fall 2021, all three will follow the same cycle, with applications open early October through early December and an award made in the spring for the following academic year. Applicants for the inaugural Claytor-Gilmer Fellowship can elect to have their materials automatically submitted for the second award cycle.

To learn more about eligibility and how to apply, visit the AMS Claytor-Gilmer Fellowship webpage at <https://www.ams.org/programs/ams-fellowships/claytor-gilmer>. If you have questions, please contact the AMS Programs Department.

Videos from the Virtual 2021 National Math Festival

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 took place April 16–18, 2021. Find NMF at nationalmathfestival.org, where you can find videos from the festivals and from the NMF Live Performance Series. This event is organized by the Mathematical Sciences Research Institute (MSRI), msri.org.

If you visit <https://vimeo.com/msri/2021-national-math-festival-online-events>, you'll find links to a number of videos, a couple of which should be of special interest to AWM members.

“Changing the ‘Face’ of Mathematics,” with the founders of *Mathematically Gifted & Black*, features Dr. Erica Graham, Dr. Raegan Higgins, Dr. Candice Price, and Dr. Shelby Wilson, who launched the website *Mathematically Gifted and Black* (MGB) in 2017. MGB is a website to celebrate the diversity of Black mathematicians, highlighting

their contributions to the mathematical sciences and community. The MGB founders spoke about the inspiration behind this website, discussed some of the profiles, and described the impacts of this initiative.

Erica Graham is an assistant professor of mathematics at Bryn Mawr College. Raegan Higgins is an associate professor of mathematics in the Department of Mathematics & Statistics at Texas Tech University. Candice Renee Price is a mathematician and assistant professor at Smith College in Northampton, MA. Shelby Wilson is Senior Data Scientist for the Johns Hopkins University Applied Physics Laboratory.

Emille Davie Lawrence presented “Math Is Play!” She said: “My love for mathematics is rooted in my childhood love of playing games and puzzles. In fact as I learned more math, the game play didn't stop. Mathematics can be found in popular games such as Rubik's cubes, chess, sudoku, poker, and countless others. I hope to introduce you to some of my favorite games and explore the mathematics behind them, including winning strategies (if they exist!).”

Davie Lawrence is Term Associate Professor of Mathematics and Statistics at the University of San Francisco. One of her passions is broadening participation in the mathematical sciences by mentoring and outreach in various nationally recognized programs, such as the Enhancing Diversity in Graduate Education (EDGE) Program for Women and the MSRI-UP summer program for undergraduates. As a self-proclaimed math coach, she loves talking about mathematics to a wide range of audiences to promote its beauty and accessibility.

Wood Receives an Alan T. Waterman Award

Excerpted from an NSF press release, May 2021

A mathematician who uses number theory to provide new perspectives on some of the oldest and most difficult problems in mathematics, and a social scientist whose innovative contributions show the impact of increased opportunity and representation on our nation's most important decisions—Melanie Matchett Wood, a Harvard University mathematician, and Nicholas Carnes, a Duke University social scientist and scholar of public policy, have earned the US National Science Foundation's Alan T. Waterman Award, the nation's highest honor for early-career scientists and engineers...

continued on page 26

The annual award ... recognizes an outstanding early-career US science or engineering researcher who demonstrates exceptional individual achievements in research in NSF-supported fields....

Unsolved mysteries in mathematics

At a young age, Melanie Matchett Wood won several MATHCOUNTS competitions and realized her passion for numbers. She also became the first female to make the U.S. International Mathematical Olympiad Team.

Throughout her scientific career, Wood has worked on some of the most difficult problems in mathematics and has developed methods that combine ideas from across mathematics. "I study questions about numbers such as what kind of patterns can we find in the prime numbers, how do numbers factor into primes, and how many solutions will an equation have," she said.

Wood studies the statistical behavior of how factorization ... works in different systems of numbers, aiming to answer questions posed 200 years ago by Carl Friedrich Gauss, a German mathematician and physicist who made significant contributions to many fields in mathematics and science. "My work has shown that by combining perspectives from probability, geometry and topology, we can understand things about how factorization works across different number systems and how number systems can be enlarged by adding in new numbers," Wood said. "Research into foundational questions in mathematics is important because it tells us about our world and about new technologies it may lead to in the future."

Wood is the sixth recipient from Harvard to receive the Waterman Award. She received her doctorate in mathematics from Princeton University in 2009.

"It is a tremendous honor to win the Waterman Award. Previous recipients include several of my 'heroes,' and it is amazing to be included in this group of scientific leaders," Wood said. "This award will allow me to direct my research in some of the most potentially exciting, but also more speculative and boundary-pushing, directions in number theory." ...

In addition to a medal, awardees each receive \$1 million over five years for research in their chosen field of science. The Waterman Award was presented to both recipients during the National Science Board virtual meeting, which was held in May.

The award, established by Congress in 1975, is named for Alan T. Waterman, NSF's first director.

SIAM Announces Class of 2021 Fellows

SIAM, March 2021

The Society for Industrial and Applied Mathematics (SIAM) is pleased to announce the 2021 Class of SIAM Fellows. These distinguished members were nominated for their exemplary research as well as outstanding service to the community. Through their contributions, SIAM Fellows help advance the fields of applied mathematics and computational science.

SIAM congratulated 28 esteemed members of the community. Here, AWM lists the women among them, along with their citations from SIAM, and adds its congratulations.

Xiaojun Chen, Hong Kong Polytechnic University, is being recognized for contributions to optimization, stochastic variational inequalities, and nonsmooth analysis.

Trachette L. Jackson, University of Michigan, is being recognized for innovative contributions to mathematical modeling in cancer biology and for the advancement of underrepresented minorities in science.

Denise Kirschner, University of Michigan, is being recognized for contributions to modeling pathogen-host interactions and host immune response in infectious diseases and training in mathematical biology/immunology.

Rachel Levy, American Mathematical Society / AAAS, is being recognized for leadership in applied mathematics education, especially in mathematical modeling, across the entire educational spectrum.

Anna L. Mazzucato, Penn State University, is being recognized for discerning analysis of fundamental problems in partial differential equations and mathematical fluid mechanics including boundary layers, transport, and mixing.

Kirsten A. Morris, University of Waterloo, is being recognized for contributions to modeling, approximation, and control design for distributed parameter systems.

Béatrice M. Rivière, Rice University, is being recognized for contributions in numerical analysis, scientific computing, and modeling of porous media.

Jennifer Scott, University of Reading and Science and Technology Facilities Council, is being recognized for contributions to sparse matrix algorithms and software.

Rebecca M. Willett, University of Chicago, is being recognized for contributions to mathematical foundations of machine learning, large-scale data science, and computational imaging.

Annual Mentoring Conference

The Mentoring Institute at UNM is pleased to announce its 14th Annual Mentoring Conference, Mentoring in an Interconnected World.

Faculty, staff, and students of higher education, researchers, K–12 educators, community leaders, administrators, non-profit partners, government agencies, and other professionals are invited to participate in this five-day event, which will be held October 18–22, 2021 at The University of New Mexico’s Student Union Building in Albuquerque, New Mexico. In the event of a virtual conference due to COVID-19 restrictions, a one-year membership to the Mentoring Institute will be included in the conference registration.

Together, attendees will develop dynamic conversations and networking opportunities through hands-on workshops, individual/panel presentations, and plenary sessions. One aim is to foster engagement among scholars and professionals in the fields of mentoring, coaching, and leadership.

The standard registration deadline is **October 8, 2021**.

Women Doubly Squeezed by Student Debt

AAUW, Washington DC, May 2021; the full report is available at https://www.aauw.org/app/uploads/2021/05/Deeper_In_Debt_2021.pdf

Student debt is making it nearly impossible for many women to afford their basic living expenses after graduating from college, a new analysis by the American Association of University Women (AAUW) shows.

The 2021 AAUW’s *Deeper in Debt* report finds that women hold an average of \$31,276 in student debt, leaving them with a monthly loan payment of \$307 the year after graduation. Given that women graduating with a bachelor’s degree expect to earn an average of \$35,338—only 81% of what men anticipate earning—meeting that loan obligation is challenging at best.

One year after college, women spend an average of \$920 per month on housing, \$396 per month on a car loan

and, for the 16% of women who are moms, \$520 on child-care, the report finds. Adding in that \$307 student loan payment makes it difficult—if not downright impossible—to make ends meet.

“This untenable level of debt is forcing many women to delay major life milestones, such as buying a home, starting a family and building the nest egg for retirement,” said AAUW CEO Kim Churches. “We cannot continue to ignore the student debt crisis—especially since women’s disproportionate share of job losses during the pandemic further undercuts their ability to pay back student loans. We need our policy makers to take action right away.”

Black Women Owe 20% More

The *Deeper in Debt* analysis also found that Black women carry about 20% more student debt than white women do. One year after graduation, white women owe \$33,851 on undergraduate loans, while Black women owe an average of \$41,466. Cumulative debt on graduate loans is \$75,085 for Black women, compared to \$56,098 for white women.

“This is yet another example of how systemic racism and systemic sexism conspire in a way that puts Black women at an even greater disadvantage,” said Churches. “The specific needs of women of color must be paramount in any policies we adopt to address this crisis.”

AAUW calls on state and local governments to make college more affordable for low- and moderate-income students by investing more in public institutions. AAUW also supports increasing and expanding federal Pell Grants, as well equitable forgiveness of student debt for all borrowers.

“Student debt is a crushing burden for millions of women, but it is also a drain on our economy,” Churches said. “We need to make college accessible and affordable to everyone. Getting a good education and becoming a productive member of society should not come at such an enormous cost.”

Indigenous Mathematicians

IndigenousMathematicians.org was launched in December 2020. The organization seeks to build a community for Indigenous Mathematicians, with three primary goals:

continued on page 29

Renew your membership at awm-math.org.

AWM WORKSHOP AT THE 2022 SIAM ANNUAL MEETING

Application deadline for graduate students: **November 15, 2021**

For many years, the Association for Women in Mathematics has held a series of workshops in conjunction with major mathematics meetings. The AWM Workshops serve as follow-up workshops to Research Collaboration Conferences for Women (RCCW), featuring both junior and senior speakers from one of the AWM Research Networks. An AWM Workshop is scheduled to be held in conjunction with the 2022 SIAM Annual Meeting, to be held July 21–25, 2022, David Lawrence Convention Center, Pittsburgh, PA.

FORMAT: The workshop will consist of two research minisymposia focused on Graph Theory and Applications organized by Katherine Benson and Daniela Ferrero, a Poster Session and an informational minisymposium directed at starting a career. The Special Session will feature selected junior and senior mathematicians from the Research Network Women in Graph Theory and Applications (WiGA). This workshop follows the RCCW that took place in August of 2019 at the Institute for Mathematics and Its Applications.

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

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

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

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

Applications must be completed electronically by **November 15, 2021**. See <https://awm-math.org/meetings/awm-siam/> for details.

MENTORS: We also seek volunteers to act as mentors for graduate students as part of the workshop. If you are interested in volunteering, please contact the AWM office at awm@awm-math.org by May 15, 2022.

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

1. bringing together Indigenous mathematicians: so we don't feel like we are the only ones,
2. inspiring students: so they can see themselves represented in the mathematical sciences, and
3. educating the broader mathematical community: about our perspectives and the work that we do.

Visit the website to see profiles of Indigenous mathematicians, the monthly newsletter, and more.

Misha Kilmer Joins ICERM

ICERM Newsletter, Spring 2021

ICERM is pleased to announce that **Misha Kilmer** is joining ICERM as a Deputy Director, effective July 1. She is the William Walker Professor of Mathematics at Tufts University with expertise in numerical linear and multilinear algebra. She specializes in the development of fast algorithms for solving large-scale, forward and inverse problems, as well as on theoretical and computational aspects of tensor decomposition.

Misha has received a number of awards and recognitions, most recently being named a Data Intensive Studies Center (DISC) Faculty Fellow at Tufts University. She is a Fellow of the Society for Industrial and Applied Mathematics (SIAM) as well as Section Editor for Research Spotlights of SIAM's flagship journal *SIAM Review*. She has served on the editorial boards of three other SIAM journals and will soon begin a term as an editor for *La Matematica*, the new flagship journal of the Association for Women in Mathematics. She is a current member of ICERM's Scientific Advisory Board.

Misha brings significant leadership experience to ICERM. She served six years as chair of the Department of Mathematics at Tufts and is co-chairing both the SIAM Conference on Applied Linear Algebra 2021 and the SIAM Conference on Computational Science and Engineering 2021.

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The Institute for Computational and Experimental
Research in Mathematics

Summer Topical & Hot Topics Workshops

Computational Aspects of Discrete Subgroups of Lie Groups – June 14-18, 2021

Organizing Committee > Alla Detinko, Univ. of Huddersfield; Michael Kapovich, UC Davis; Alex Kontorovich, Rutgers Univ.; Peter Sarnak, IAS/Princeton; Richard Schwartz, Brown Univ.

Applications of Rough Paths: Computational Signatures and Data Science – July 6-9, 2021

Organizing Committee > Thomas Cass, Imperial College London; Terry Lyons, Univ. of Oxford; Hao Ni, Univ. College London; Harald Oberhauser, Univ. of Oxford; Mihaela van der Schaar, Univ. of Cambridge.

Hot Topics: Workshop on Advances in Theory and Algorithms for Deep Reinforcement Learning August 2-4, 2021

Organizing Committee > Nan Jiang, Univ. of Illinois; Sanjay Shakkottai, Univ. of Texas Austin; Rayadurgam Srikant, Univ. of Illinois at Urbana-Champaign; Mengdi Wang, Princeton.

Research Community in Algebraic Combinatorics August 5-6, 2021 (part 1)

Organizing Committee > Susanna Fishel, Arizona State Univ.; Pamela Harris, Williams College; Rosa Orellana, Dartmouth College; Stephanie van Willigenburg, Univ. of British Columbia.

D-modules, Group Actions, and Frobenius: Computing on Singularities – August 9-13, 2021

Organizing Committee > Christine Berkesch, Univ. of MN; Linquan Ma, Purdue Univ.; Claudia Miller, Syracuse Univ.; Claudia Raicu, Univ. of Notre Dame; Uli Walther, Purdue Univ.

Prediction and Variability of Air-Sea Interactions: the South Asian Monsoon – August 23-27, 2021

Organizing Committee > Baylor Fox-Kemper, Brown Univ.; Jennifer MacKinnon, UCSD; Hyodae Seo, WHOI; Emily Shroyer, Oregon State Univ.; Aneesh Subramanian, CU Boulder; Amit Tandon, UMass Dartmouth.

Hot Topics: Foam Evaluation – November 5-7, 2021

Organizing Committee > Mikhail Khovanov, Columbia Univ.; Aaron Lauda, Univ. of Southern California; Louis-Hadrien Robert, Univ. of Luxembourg.

Holistic Design of Time-Dependent PDE Discretizations – January 10-14, 2022

Organizing Committee > David Ketcheson, King Abdullah Univ.; David Keyes, King Abdullah Univ.; Michael Minion, Lawrence Berkeley National Lab.; Jingmei Qiu, Univ. of Delaware; Benjamin Seibold, Temple Univ.; Carol Woodward, Lawrence Livermore National Lab.

Full details can be found at: icerm.brown.edu
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MSRI 2021-22 Scientific Workshops

The Mathematical Sciences Research Institute in Berkeley, California announces the following workshops scheduled for the 2021-22 academic year. (Pending ongoing COVID-19 disruptions, some workshops may be held online.)

AUGUST 18-20, 2021:

Connections Workshop: Universality and Integrability in Random Matrix Theory and Interacting Particle Systems

Organizers: Ioana Dumitriu* (University of California, San Diego), Alisa Knizel (The University of Chicago)

AUGUST 23-27, 2021 :

Introductory Workshop: Universality and Integrability in Random Matrix Theory and Interacting Particle Systems

Organizers: Gerard Ben Arous* (New York University, Courant Institute), Alice Guionnet (École Normale Supérieure de Lyon), Sylvia Serfaty (New York University, Courant Institute), Horng-Tzer Yau (Harvard University)

SEPTEMBER 20-24, 2021: Hot Topics: Regularity Theory for Minimal Surfaces and Mean Curvature Flow

Organizers: Christine Breiner* (Fordham University), Otis Chodosh (Stanford University), Luca Spolaor (University of California, San Diego), Lu Wang (California Institute of Technology)

OCTOBER 18-22, 2021:

Integrable Structures in Random Matrix Theory and Beyond

Organizers: Jinho Baik* (University of Michigan), Alexei Borodin (Massachusetts Institute of Technology), Tamara Grava (University of Bristol; International School for Advanced Studies (SISSA/ISAS)), Alexander Its (Indiana University - Purdue University), Sandrine Péché (Université de Paris VII (Denis Diderot))

* Denotes lead organizer(s)

NOVEMBER 19-20, 2021:

Blackwell Tapia Conference

Organizers: David Banks (Duke University), H el ene Barcelo (MSRI - Mathematical Sciences Research Institute), Lloyd Douglas, Robert Megginson (University of Michigan), Mariel Vazquez (University of California, Davis), Ulrica Wilson (Morehouse College; Institute for Computational and Experimental Research in Mathematics (ICERM))

JANUARY 20-21, 2022:

Connections Workshop: The Analysis and Geometry of Random Spaces

Organizers: Mario Bonk (University of California, Los Angeles), Joan Lind* (University of Tennessee), Eero Saksman (University of Helsinki), Jang-Mei Wu (University of Illinois at Urbana-Champaign)

JANUARY 24-28, 2022:

Introductory Workshop: The Analysis and Geometry of Random Spaces

Organizers: Mario Bonk* (University of California, Los Angeles), Joan Lind (University of Tennessee), Steffen Rohde (University of Washington), Fredrik Viklund (Royal Institute of Technology)

FEBRUARY 3-4, 2022:

Connections Workshop: Complex Dynamics - from Special Families to Natural Generalizations in One and Several variables

Organizers: N uria Fagella (University of Barcelona), Tanya Firsova* (Kansas State University), Thomas Gauthier ( cole Polytechnique), Sarah Koch (University of Michigan)

FEBRUARY 7-11, 2022:

Introductory Workshop: Complex Dynamics - from Special Families to Natural Generalizations in One and Several variables

Organizers: Anna Benini (Universit  di Parma), Fabrizio Bianchi (Universit  de Lille), Mikhail Hlushchanka (Universiteit Utrecht), Dylan Thurston* (Indiana University)

MARCH 28 - APRIL 1, 2022: The Analysis and Geometry of Random Spaces

Organizers: Nikolai Makarov (California Institute of Technology), Steffen Rohde* (University of Washington), Eero Saksman (University of Helsinki), Amanda Turner (University of Lancaster), Fredrik Viklund (Royal Institute of Technology), Jang-Mei Wu (University of Illinois at Urbana-Champaign)

MAY 2-6, 2022: Adventurous Berkeley Complex Dynamics

Organizers: Mikhail Lyubich (State University of New York, Stony Brook), Jasmin Raissy* (Institut de Math ematiques de Toulouse), Roland Roeder* (Indiana University--Purdue University), Dierk Schleicher (Universit  d'Aix-Marseille (AMU)), Mitsuhiro Shishikura (Kyoto University)

Funding awards are typically made eight weeks before the workshop begins. Requests received after the funding deadlines are considered only if additional funds become available. MSRI is pleased to be able to offer a private room for nursing mothers.

msri.org/workshops

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Mathematical Sciences
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The Institute is committed to the principles of Equal Opportunity and Affirmative Action. Students, recent Ph.D.s, women, and minorities are particularly encouraged to apply.



MSRI has been supported from its origins by the National Science Foundation, now joined by the National Security Agency, over 100 Academic Sponsor Institutions, by a range of private foundations, and by generous and farsighted individuals.



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Call for Applications

2022 SUMMER RESEARCH IN MATHEMATICS

The Mathematical Sciences Research Institute in Berkeley, California invites applications for its **Summer Research in Mathematics (SRiM)** program.

The purpose of this program is to provide space and funds to small groups of mathematicians, especially women and gender-expansive individuals, whose ongoing research may have been disproportionately affected by various obstacles including family obligations, professional isolation, or access to funding.

PROGRAM ELIGIBILITY & FUNDING

- Groups of 2 to 6 mathematicians with partial results on an established project may submit an application to the program.
- Each member of the group must have a Ph.D. in mathematics or advanced graduate standing. At least one member must be U.S. based.
- Each group may apply to be in residence at MSRI for a minimum of two weeks. All group members must be in residence for the duration of the visit.
- **The visits must take place between June 6 - July 15, 2022.**
- Lodging on UC Berkeley campus, all meals, and reimbursement of travel expenses will be provided.
- **For group members with children**, MSRI will provide funding that makes it possible for the member to fully take part in the program.

For full application details, visit:

msri.org/summer

Application deadline: December 1, 2021

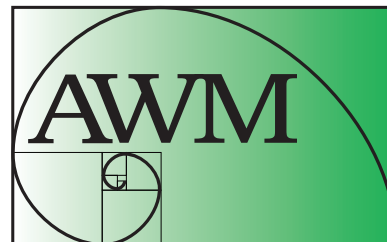
Support for SRiM 2022 is provided by Microsoft Research, Priscilla Chou, and Kristin Lauter.

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For further information, see awm-math.org.



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