



ASSOCIATION FOR
WOMEN IN MATHEMATICS

Newsletter

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The purpose of the Association for Women in Mathematics is to create a community in which women and girls can thrive in their mathematical endeavors, and to promote equitable opportunity and gender-inclusivity across the mathematical sciences.

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PRESIDENT'S REPORT

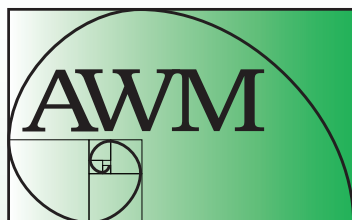
As I write this, summer is unmistakably winding down, and I find myself, as I do every year, a little wistful about it. This one was fuller than most, so let me back up and walk through it.

In early July, I traveled to Cleveland, OH, for the SIAM Annual Meeting. I had the pleasure of introducing Fioralba Cakoni, who delivered this year's AWM–SIAM Sonia Kovalevsky Lecture, established to highlight significant contributions of women to applied or computational mathematics. The AWM Workshop, organized by Fengyan Li and Jing-Mei Qiu, featured minisymposia on Numerical Analysis and Scientific Computing, drawing on speakers from the research network Women in the Numerical Analysis and Scientific Computing (WiNASC). Alongside the minisymposia, we held a poster session, a panel, and a mentoring luncheon, where workshop participants connected with mathematicians across career stages. I want to offer special congratulations to Nandi Leslie, who received the 2026 SIAM Industry Prize for her work advancing cybersecurity and network resilience. Leslie was honored in Deck 2 of EvenQuads, which spotlights notable women mathematicians and can be used to play a variety of mathematical games. It's always a joy to see someone we've celebrated in that way recognized on such a stage.

Cleveland also gave me something I don't get enough of: in-person time with our staff and leadership. Darla, our executive director, and Cristina, our president elect, and I meet weekly online. Kylie, our development director is someone I mostly correspond with by email, so seeing her in Cleveland was a treat, only the third time we've been in the same room, after the 2025 Research Symposium and this year's Joint Mathematics Meetings. Between sessions and over dinner, we simply hung out and got to know each other better: work, family, and everything in between. I came away from those conversations grateful for the people I get to do this work alongside.

Just last week, the world's mathematicians gathered in Philadelphia for the International Congress of Mathematicians (ICM), the first time it has been held in the United States in four decades. As part of the lead-up, the Committee for Women in Mathematics (CWM) organized the third World Meeting for Women in Mathematics, (WM)², a satellite event held the day before the Congress opened, and AWM co-organized an accompanying panel with CWM. I had been invited to offer five minutes of welcoming remarks on July 22, alongside IMU Vice President Ulrike Tillmann and AMS President Ravi Vakil. I had every intention of being in Philadelphia for it, but life had other plans: my brother-in-law got married in California that same week, and family won out. I am grateful to our Past President, Talitha Washington, for giving those welcoming remarks in my place, and to Emille Lawrence, one of our current Members-at-Large, for representing AWM at our luncheon on July 25, whose guests included women invited to speak at ICM, along with their guests and a few friends and supporters of AWM. Darla co-moderated the panel, "Finding and Defining Success in Mathematics: Pathways

continued on page 2



ASSOCIATION FOR WOMEN IN MATHEMATICS

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

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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.

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PRESIDENT'S REPORT *continued from page 1*

and Measures,” with panelists Annalisa Crannell, Fern Hunt, Emily Riehl, and Shelby Wilson.

Even from California, I kept an eye on who else from our community was at the Congress. I’ll note that Talithia Williams of Harvey Mudd College spoke at ICM; members may remember her as our AWM-MAA Etta Zuber Falconer Lecturer back in 2017. Ingrid Daubechies also gave a public lecture at ICM, and AWM members have reasons to be proud: Daubechies served as our 2006 Emmy Noether Lecturer and was named an AWM Fellow in 2019. That lecture, fittingly, traces back to us: AWM started the tradition of annual Noether Lectures at JMM, and after special one-off ICM editions in 1994, 1998, and 2002, the ICM Emmy Noether Lecture became a permanent fixture of the Congress starting in 2006, the very year Daubechies gave it. This year’s ICM Emmy Noether Lecturer, Karen Vogtmann, is an AWM member too. It’s a good reminder of how much of that history runs through this organization, and honestly, once I started looking, I found our fingerprints all over this Congress. Susanne Brenner (2011 AWM–SIAM Kovalevsky Lecturer, 2020 AWM Fellow), Éva Tardos (2018 Kovalevsky Lecturer), and Annalisa Buffa (2023 Kovalevsky Lecturer) all spoke, alongside Monica Visan, this year’s AWM–AMS Noether Lecturer, and Gigliola Staffilani, who will deliver that same lecture in 2027. Several past AWM research and dissertation prize winners were on the program as well: Emily Riehl (2021 Birman Research Prize), Jinyoung Park (2022 AWM Dissertation Prize), Yunqing Tang (2017 AWM Dissertation Prize, 2024 Microsoft Research Award), Jennifer Balakrishnan (2022 Microsoft Research Award), Sarah Peluse (2014 Alice T. Schafer Prize), and Hong Wang (2026 Sadosky Research Prize). Rounding things out, current and former AWM members or prize winners Shiri Artstein-Avidan, Jessica Fintzen, Jemma Lorenat, Maggie Miller, Lisa Piccirillo, Chikako Mese, Rachel Greenfeld, and Jennifer Morse all delivered section lectures, while Hee Oh delivered a plenary lecture. For one Congress, that was a remarkable amount of AWM in the room.

From California, I’ll head nearly straight into MAA MathFest, held August 5–8 in Boston, closing out a genuinely breathless stretch of summer travel. I’m looking forward to it: Christina Edholm of Scripps College will deliver this year’s AWM-MAA Etta Zuber Falconer Lecture, honoring, as always, women who have made distinguished contributions to the mathematical sciences or mathematics education.

In the May–June issue, I mentioned that AWM was working to bring in more support for graduate students and early career researchers who participate in the research symposium and in workshops connected to SIAM and JMM in the years ahead. I’m glad to report real progress on that front. In May, we received confirmation that Jane Street will serve as our main sponsor for JMM 2027; their support lets us host events with confidence. And after a pause in the NSF-AWM Travel Grant Program for Women, I’m happy to share that friends of AWM have stepped forward to support the program, which will resume in October, with the application portal opening August 15. We are truly indebted to all these funders for their generosity and their belief in our mission.

We also have good news on the leadership front. In June, the Henry Luce Foundation approved our grant to cultivate a new generation of leaders among women mathematicians through the AWM-HERS Leadership Program.

And speaking of growth: our Mentor Network is getting a glow-up. We’ve partnered with Turazo to bring modern, scalable matching and operations to the program, pairing mentors and mentees with greater intentionality and ease than our current system allows. Of course, a shinier engine still needs fuel, so consider this your official invitation: we need more mentors. If you’ve ever wished someone had shown you

the ropes earlier in your career, here's your chance to be that person for someone else. Sign up and join the network.

I'd be remiss if I closed this report on events alone, because there is real advocacy work in front of us this fall. The Department of Homeland Security has finalized a rule ending "Duration Status" for F-1 and J-1 visa holders, replacing it with a fixed four-year admission period, effective for students entering this September. Mathematics graduate programs across the country rely heavily on international students, many of whom pursue PhDs that take longer than four years. Those students will need to navigate an extension process with no guarantee of approval, mid-degree. This is worth watching closely, and I'd encourage department chairs and graduate directors in our community to make sure their international students know what's coming.

Separately, the Office of Management and Budget has proposed the rule "Regulation for Federal Financial Assistance," which would give political appointees new authority over funding decisions currently guided by peer review. As proposed, it would let agencies deny or terminate grants that don't align with the administration's priorities, add pre-approval requirements around conference attendance, society memberships, and publications, and weigh applicants' institutional affiliations in funding decisions. By the close of the public comment period, the proposal had drawn nearly half a million comments, the overwhelming majority in opposition, and mathematicians were among those who weighed in. We were among those in opposition.

As I look at the calendar ahead, I'm reminded that our community does its best work when we show up for each other, in a lecture hall in Cleveland, on a panel in Philadelphia (even in absentia), or in a comment letter to a federal agency. I sincerely appreciate how you continue to show up.



Raegan Higgins

Raegan Higgins
Lubbock, TX
August 1, 2026

Special Issue of the *AMS Bulletin*

The July 2026 issue of the *AMS Bulletin* is a special issue on the "Contours of Oswald Veblen's Life and Work." It is devoted to the legacy of Veblen (1880–1960), mathematician and AMS president (1923–1924), after whom the AMS Oswald Veblen Prize in Geometry is named. AWM members are encouraged to read the article, "Dear Miss Seely: Dr. Caroline Seely, Oswald Veblen, and the transformation of American Mathematics," by Ellen Abrams, Benjamin Braun, and Sloan Despeaux. Caroline Seely, PhD Columbia 1915, worked at the AMS from 1913 until 1935. Originally hired to do clerical work, her work over the years expanded to include editorial work at the *Transactions* and the *Bulletin of the AMS*, and financial and other administration for the AMS. She also continued research activity in publications and conference participation. Further information on her extraordinary career can be found in "Caroline Seely at the AMS (1913–35): From Executive Assistant to Associate Editor," by James J. Tattersall and Shawn L. McMurran, *Notices of the AMS*, August 2023.

Membership Dues

Membership runs from Oct. 1 to Sept. 30

Individual: \$70/\$100 **Family:** \$40

Contributing: \$160/\$190

New member, affiliate and reciprocal members, retired, part-time: \$35

Student: \$25 **Unemployed:** \$20

Outreach: \$10

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Supporting Institutions: \$750+ and

Sponsoring Institutions: \$3000+

See awm-math.org for details.

Executive Sponsorship Levels

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\$2500–\$4999

\$1000–\$2499

See awm-math.org for details.

Print Subscriptions and Back Orders—

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

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

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

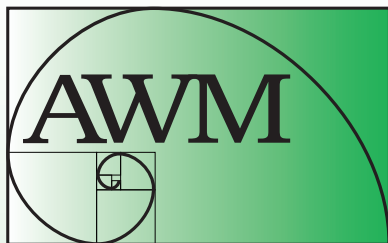
Newsletter Deadlines

Editorial: 17th of January, March, May, July, September, November

Ads: Feb. 1 for March–April, April 1 for May–June, June 1 for July–August, August 1 for September–October, October 1 for November–December, December 1 for January–February

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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

September 15, 2026:
Deadline for AWM-MAA Falconer
Lecture nominations

September 15, 2026:
Deadline for AWM Alice T. Schafer
Prize nominations

September 15, 2026:
Deadline for AWM Dissertation
Prize nominations

September 15, 2026:
Deadline for the 2027 AWM-AMS
Noether Lecture nominations

September 15, 2026:
Deadline for the Sonia Kovalevsky
Lecture nominations

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Maggie Miller Wins the AWM Joan & Joseph Birman Research Prize in Topology and Geometry

The Association for Women in Mathematics (AWM) will present the 2027 AWM Joan & Joseph Birman Research Prize in Topology and Geometry to **Maggie Miller**, Assistant Professor in the Department of Mathematics at The University of Texas at Austin, at the Joint Mathematics Meetings in Chicago, IL, in January 2027. Miller is being honored for her outstanding and influential research in geometric topology, knot theory, and low-dimensional topology.



Maggie Miller

Citation

Miller is a leader in the low-dimensional topology community and an exceptional researcher whose work combines phenomenal visual intuition, technical depth, originality, and remarkable breadth. Her PhD thesis made major progress on a longstanding question of Casson and Gordon concerning homotopy 4-spheres. These results were consequences of her foundational work on the interaction between fibrations on knot and surface complements. Her subsequent work, both solo and with collaborators, resolves several long-outstanding questions on concordance of surfaces in 4-manifolds, knots and their spanning surfaces in dimensions 3 and 4, and knotted surfaces, via a broad set of techniques, and includes many intricate diagrammatic and geometric constructions.

Miller is currently an assistant professor in the Department of Mathematics at the University of Texas at Austin. Before joining UT Austin, she was a Clay Research Fellow through the Clay Mathematics Institute, a Stanford Science Fellow at Stanford University and an NSF Postdoctoral Fellow at the Massachusetts Institute of Technology. She received her PhD in Mathematics from Princeton University in 2020, under the supervision of David Gabai. Her work has already received major recognition, including the Maryam Mirzakhani New Frontiers Prize, a Sloan Research Fellowship, a Packard Fellowship, and an invited sectional lecture at the 2026 International Congress of Mathematicians.

Response from Maggie Miller

I am very grateful to receive the Joan & Joseph Birman Research Prize! Thank you very much to the Birmans and the AWM for supporting the endeavors of women and other gender minorities in mathematics research. Joan Birman's work in topology has been an inspiration to me and other colleagues in my generation, and I'm honored to receive this award named for her. I'm also honored to be in the company of the previous prize winners, as I am aware of the work of each previous winner and know they are all amazing mathematicians.

I am also thankful to my mentors, especially my PhD advisor David Gabai, and also my postdoctoral advisors Ciprian Manolescu and Tomasz Mrowka and my undergraduate advisor Cameron Gordon. I've relied often on their advice in my research career. I am fortunate to be part of the low-dimensional topology community, where

I have found excellent collaborators and made good friends working in similar areas. This community was very supportive in including me in research when I started, and I hope to continue this tradition in creating an inclusive environment for new researchers. I think the field of low-dimensional topology is at an exciting time, and I look forward to interesting projects and conversations in the future.

Established in 2012, the AWM Joan & Joseph Birman Research Prize highlights exceptional research in topology/geometry by a woman early in her career. The award is made possible by a generous contribution from Joan Birman, whose work has been in topology, and her husband, Joseph, who was a theoretical physicist specializing in applications of group theory to solid state physics. The Joint Mathematics Meetings are scheduled for January 12–15, 2027, in Chicago, IL.

Lesley Ain McClure Wins AWM Mary and Alfie Gray Award for Social Justice

The Association for Women in Mathematics (AWM) will present the 2027 AWM Mary and Alfie Gray Award for Social Justice to **Leslie Ain McClure**, dean of the College for Public Health and Social Justice and professor of biostatistics at Saint Louis University, at the Joint Mathematics Meetings in Chicago, IL, in January 2027.

Citation

The Association for Women in Mathematics presents the Mary and Alfie Gray Award for Social Justice to Leslie Ain McClure, dean of the College for Public Health and Social Justice and professor of biostatistics at Saint Louis University, for a career that brings the mathematical sciences vigorously and imaginatively to bear on the cause of social justice.

For more than twenty-five years, McClure has used rigorous biostatistical theory and spatial statistical methods to show how race, place, socioeconomic position, and policy shape unequal health outcomes across the life course. Through the imaginative application of novel measures of neighborhood, environmental, and social disadvantage, her work makes structural inequities visible and locates their causes in systemic conditions rather than in the individuals who experience them, ensuring that, rather than perpetuate biases, mathematical models and analyses reflect lived realities.

McClure's commitment to justice extends to her leadership and mentorship, from nine years on the Executive Council of the Math Alliance to her advising and mentorship of scholars traditionally underrepresented in the mathematical sciences. For research, leadership, and mentorship that together demonstrate the power of mathematics in the service of social justice, AWM is honored to recognize Leslie Ain McClure.

Response from Leslie Ain McClure

I am deeply honored to receive the 2027 Mary and Alfie Gray Award for Social Justice from the Association for Women in Mathematics. I am humbled to be associated with the legacy of Mary and Alfred Gray, and I will strive to continue honoring their commitment to human rights, equity, and justice through my research, teaching, mentoring, and leadership.

My career has been guided by the desire to do good through my research. As a biostatistician, my work is inherently collaborative, and I have been fortunate to partner with colleagues across disciplines who share a commitment to understanding and addressing health inequities. I am grateful to each of my collaborators, whose insights and dedication have shaped both my work and my perspective, and who continually challenge me to ensure that our research reflects our shared commitment to social justice.

Mentoring has also been one of the greatest privileges of my career. I have learned as much from my mentees as they have from me, and this recognition belongs in no small part to them. Their curiosity, resilience, and commitment to making a difference inspire me every day, and I am extremely thankful for the trust they have placed in me.

I am grateful to the Association for Women in Mathematics for recognizing the vital role that mathematical scientists can play in advancing social justice, and for honoring me with this award.

Established in 2022, the Mary and Alfie Gray Award for Social Justice recognizes 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 Joint Mathematics Meetings are scheduled for January 12–15, 2027, in Chicago, IL.



Lesley Ain McClure
(Photo by Sarah Conroy,
Saint Louis University)

Marilyn Carlson to Receive the Louise Hay Award for Contributions to Mathematics Education

The Association for Women in Mathematics is pleased to announce the 2027 Louise Hay Award for Contributions to Mathematics Education will be presented to **Marilyn Carlson**, Professor in the School of Mathematical and Statistical Sciences at Arizona State University, for her substantial contributions to mathematics education and her continued contributions to research on teaching and learning. The award will be presented at the Joint Mathematics Meetings in Chicago, IL, in January 2027.

Citation

Dr. Marilyn Carlson is a professor in the School of Mathematical and Statistical Sciences at Arizona State University (ASU). Over an illustrious forty-five-year career, her substantial contributions to mathematics education have largely centered on undergraduate mathematics, particularly around college algebra, precalculus, and calculus. As one nominator notes, her research and development projects “have generated novel insights into developing and adapting research-based assessments, curricula, and professional development for mathematics faculty, graduate students, and secondary teachers.” In addition to her long-standing and impactful research agenda designed to enhance the teaching and learning of these core mathematics topics, she also has led a number of important program development initiatives, including as a collaborator in designing ASU’s PhD program in mathematics education. She has been the major advisor of eighteen PhD students and has served on numerous other graduate student committees, receiving the Outstanding Doctoral Student Mentor Award from ASU in 2013, and serves as an undergraduate mentor at ASU, as well.

Notably, Dr. Carlson’s efforts to improve mathematics education across secondary and postsecondary learning environments have had substantial national impact for thousands of students and their instructors. (One of her college mathematics textbooks, *Precalculus: Pathways to Calculus*, is in its 10th edition.) Further, as one nominator’s letter attests, she has “consistently contributed to national research initiatives aimed at advancing both mathematics teaching and learning,” collaborating with the Mathematical Association of America (MAA), the National Research Council, and others around a number of projects to inform understanding of mathematics learning across key mathematical topics. Her and her collaborators’ national assessment instruments around precalculus and calculus: the Calculus Concept Readiness (CCR) exam (Carlson, Madison & West, 2015) and the Algebra and Precalculus Concept Readiness (APCR) exam are now part of the MAA’s nationally disseminated suite of placement tests and are widely used by mathematics departments to assess student readiness for calculus and learning in college algebra and precalculus. A highly sought-after researcher, consultant, and speaker, Dr. Carlson’s significant contributions to mathematics education are ongoing—she

publishes extensively in mathematics and mathematics education outlets, has received university and national awards and recognitions (including the MAA’s Selden Award for Research in Undergraduate Mathematics Education), has served on a number of national committees and advisory boards, and has given many national and international keynote lectures and talks.



Marilyn Carlson

Response from Carlson

I am deeply honored to receive the 2027 Louise Hay Award for Contributions to Mathematics Education and am humbled to be included among its distinguished recipients. Dr. Hay’s pioneering research, mentorship of mathematics students, and advocacy for women and other underrepresented groups in mathematics is a powerful reminder of the profound difference one mathematician can make—not only in advancing our field, but also in expanding opportunities for all students to learn, participate, and succeed in mathematics.

It is in that spirit that I reflect on my own journey into mathematics education research. I first pursued this work because I wanted to become a more effective mathematics instructor—one who could make important mathematical ideas accessible and learnable by all students. I recognized that my undergraduate and graduate preparation had not equipped me to respond to the calls by professional organizations to engage students’ mathematical thinking and foster deep conceptual understanding. I also came to realize that teaching students to answer textbook questions was not, by itself, engaging their reasoning or helping them develop lasting understandings of fundamental mathematical ideas and the relationships among them. Those realizations marked the beginning of what has become a forty-five-year journey of research, learning, and curriculum development.

My early studies revealed that many beginning calculus students—including those who had earned an A in precalculus—possessed only a superficial understanding of ideas that are foundational for learning calculus. As a result, they were often unprepared to develop meaningful understandings of calculus concepts or apply them effectively in unfamiliar contexts. These findings inspired a long-term research program that built on the important work of many mathematics education scholars. Together with my PhD students, we engaged in a sequence of

studies that investigated the understanding, learning, and teaching of fundamental ideas of calculus and precalculus. Each of my eighteen doctoral students brought unique perspectives and made important contributions to our collective understanding of how students learn, reason, and solve problems involving fundamental mathematical ideas.

Looking back, I am especially grateful for the privilege of working alongside an extraordinary community of colleagues, graduate students, teachers, and students. Their insights, creativity, generosity, and shared commitment to improving students' opportunities to learn mathematics have enriched my life and made this journey far more rewarding than I could have imagined. I am also deeply grateful to the funding agencies whose confidence in our vision made it possible to pursue the sustained, iterative program of research and development that this endeavor required. This support enabled us to conduct fine-grained studies of students' reasoning and conceptual development over extended periods of time.

Through years of iterative cycles of research, design, implementation, and refinement, we learned from students, from teachers, and from one another. Together, we developed assessment instruments, instructional materials, and professional development resources that foster and assess students' conceptual understanding and problem-solving abilities, while helping instructors better understand and build on their students' mathematical thinking. Most importantly, these collective efforts resulted in a model for the initial design and continual refinement of curriculum and professional development that is grounded in research on how students learn mathematics and how instruction can best support that learning. It is my hope that my body of work serves as one example of the power of design research to create instructional resources that enable mathematics instructors to foster students' mathematical thinking, confidence, and deep understanding of fundamental concepts.

As I reflect on receiving an award that bears Louise Hay's name, I am reminded that lasting advances are typically the result of sustained inquiry and our greatest contributions are rarely the result of individual effort alone. They emerge through collaboration, mentorship, and a shared commitment to improving opportunities for others.

I would like to close by expressing my gratitude to the AWM Awards Committee and the Association for Women in Mathematics for this honor and for their enduring commitment to support the contributions of women in mathematics. I also want to express my deep gratitude to Uri Treisman, Josef Dorfmeister, Dick Stanley, Milt Glick, and Tom Trotter for believing in me, encouraging me, and opening doors that helped shape my journey. Finally, to my two children, thank you for walking this journey with me. Your love, encouragement, patience, and the many sacrifices you made along the way have meant more than I can express. My greatest hope is that, through my own commitment to lifelong learning, perseverance, and purposeful work, I have inspired you to pursue your own dreams with curiosity, courage, and confidence.

Established in 1991, the Hay Award recognizes outstanding achievements in any area of mathematics education. Louise Hay was widely recognized for her contributions to mathematical logic, for her strong leadership as head of the Department of Mathematics, Statistics, and Computer Science at the University of Illinois at Chicago, for her devotion to students, and for her lifelong commitment to nurturing the talent of young women and men. The annual presentation of this award is intended to highlight the importance of mathematics education and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being. It will be presented at the Joint Mathematics Meetings, scheduled for January 12–15 in Chicago, IL.

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 (September 15, 2024 to September 14, 2026). They must either be a US citizen or have graduated from a university in the US. The Prizes will be presented at the Joint Mathematics Meetings in Chicago, IL.

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 copy of the dissertation and/or a URL address where it can be accessed, 3) two letters supporting the nomination, and 4) a curriculum vitae of the candidate not to exceed three pages. 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 **September 15, 2026**. 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.

AWM Honors Pamela E. Harris With the M. Gweneth Humphreys Award for Mentorship of Undergraduate Women

The Association for Women in Mathematics will present the 2027 M. Gweneth Humphreys Award for Mentorship of Undergraduate Women to **Pamela E. Harris**, professor of mathematics and associate vice chancellor for research at the University of Wisconsin, at the Joint Mathematics Meetings in Chicago, IL, in January 2027. Harris is recognized for her deep dedication to mentoring and her extensive contributions to broadening inclusivity in the mathematics community.

Citation

Dr. Pamela E. Harris' impact on young mathematicians has been dramatic and expansive. She has supervised the research of over 120 undergraduate students, a majority of whom identify as members of groups historically excluded in higher education. Her students speak effusively about her empathy, encouragement, and dedication.

"Professor Harris goes above and beyond to empower women in math so that we feel we belong. ... She makes the field a brighter, more accessible, and more welcoming space for students from under-represented backgrounds."

"Professor Harris is my hero, and I stand where I am today thanks to her limitless devotion and mentorship. ... She is the type of person who believes in us in such a way that we end up believing in ourselves and our worth."

Beyond working with her own students, Dr. Harris has reshaped the broader landscape of mentoring in mathematics through numerous initiatives to help others become better mentors for women and students from underrepresented groups. She is president and cofounder of Lathisms: Latinxs and Hispanics in the Mathematical Sciences, co-hosts the podcast *Mathematically Uncensored*, co-led the MSRI Critical Issues workshop Mentoring for Equity, and is coauthor of

multiple books on equity in mathematics departments. Among these are *Asked and Answered: Dialogues On Advocating For Students of Color in Mathematics*, which is read in book clubs around the country. These widely accessible resources serve as guiding lights for policy and practice changes by laying out a concrete pathway for others who wish to reflect on and improve their mentoring practices with attention to race, gender, and other intersectional identities.

The AWM is very pleased to honor Dr. Harris for her extraordinary work as a mentor and for all she has done to transform the larger culture of mentorship and inclusivity in mathematics.

This award is named for M. Gweneth Humphreys (1911–2006). Professor Humphreys earned her master's degree from Smith College and her PhD at age 23 from the University of Chicago in 1935. She taught mathematics to women for her entire career, at Mount St. Scholastica College, Sophie Newcomb College, and finally for over thirty years at Randolph-Macon Woman's College. This award, funded by contributions from her former students and colleagues at Randolph-Macon Woman's College, recognizes her commitment to and her profound influence on undergraduate students of mathematics. It will be presented at the Joint Mathematics Meetings, scheduled for January 12–15, 2027, in Chicago, IL.



Pamela E. Harris

AWM Names Eight Fellows for 2027

The Association for Women in Mathematics (AWM) has named eight mathematicians as 2027 AWM Fellows.

Vrushali A. Bokil, *Oregon State University*

For her outstanding leadership and tireless advocacy to make mathematics more accessible to those underprivileged and under-represented in STEM. She brings a deep understanding of the value of diversity, access, equity, and inclusion for faculty and student success, and has created important structural changes to ensure sustainable impact.

Malena Espanol, *Arizona State University*

For her extraordinary commitment to mentoring and advancing women in mathematics through leadership, inclusive program development, and transformative outreach. Her mentorship, service to AWM, and training networks, have created inclusive pathways across all career stages.

Suzanne S. Fernandes-Sindi, *University of California at Merced*

For her sustained national leadership in advancing women and underrepresented groups in the mathematical sciences through founding Cal-Bridge Mathematics, her stewardship of the Workshops for Women in Mathematical Biology, and her inclusive departmental leadership as Chair of UC Merced Applied Mathematics.

Teena Gerhardt, *Michigan State University*

For her work ranging from local involvement with her AWM Student Chapter to her large-scale national service with SLMath and the AWM. Her outstanding and sustained service includes extensive inclusive conference organization; continued support of Women in Topology; and mentoring to women, students, and mathematicians.

Marta Lewicka, *University of Pittsburgh*

For sustained leadership and impact in advancing women and girls in mathematics through mentorship, community building, and outreach initiatives. Her transformative programs welcome students at all levels, while fostering inclusive environments which support the development, visibility, and success of women in the mathematical sciences.

Alison Marr, *Southwestern University*

For her outstanding leadership in advancing women in mathematics through codirecting the EDGE Program, mentoring undergraduate researchers, and creating innovative courses on women in mathematics. Her work fosters belonging through building inclusive communities that elevate overlooked voices, all while empowering women as scholars, researchers, and leaders alike in mathematical sciences.

Tai Melcher, *University of Virginia*

For her creation of the Women in Probability network; co-organizing various activities thereof; professional mentoring of early career probabilists; and involvement in numerous AWM events. She provides consistent and outstanding support for broadening the participation of women, girls, and others who are underrepresented in mathematics.

Nancy Ann Neudauer, *Pacific University*

For her far-reaching mentoring from the Global South to the Pacific Northwest which has influenced generations of women mathematicians. Her sustained work has developed undergraduate and faculty women research communities; connected geographically isolated women mathematicians; removed barriers for women in Africa and elsewhere; and created pathways for women to succeed.

The AWM Executive Committee established the Fellows Program to recognize members who have demonstrated a sustained commitment to the support and advancement of women in the mathematical sciences, consistent with the AWM mission: “to create a community in which women and girls can thrive in their mathematical endeavors, and to promote equitable opportunity and treatment of women and others of marginalized genders and gender identities across the mathematical sciences.”

AWM at the 2026 SIAM Annual Meeting

Fengyan Li (Rensselaer Polytechnic Institute), Jing-Mei Qiu (University of Delaware)

The 2026 Society for Industrial and Applied Mathematics (SIAM) Annual Meeting was held in Cleveland, Ohio, USA, from July 6–10. As part of the conference, the Association for Women in Mathematics (AWM) hosted a series of events during its two-day workshop on July 6–7. The AWM Workshop at SIAM 2026 was supported by an American Mathematical Society (AMS) Backstop Grant. In particular, the backstop grant provided travel support for poster presenters, minisymposium speakers, career panelists, and workshop and panel organizers.

The 2026 AWM workshop also served as a follow-up to *Empowering a Diverse Computational Mathematics Research Community*, a 12-day collaborative workshop held at the Institute for Computational and Experimental Research in Mathematics (ICERM) from July 22 to August 2, 2024. That ICERM workshop was cosponsored by ICERM and SIAM and partially coordinated by the Women in Numerical Analysis and Scientific Computing (WINASc) Research Network, one of the AWM Research Networks.

The AWM Workshop centered on scientific exchanges, mentoring, and community building among participants



across career stages and research areas in applied and computational mathematics. It opened on Monday with a two-part “AWM Minisymposium, Structure-Preserving and Computationally-Efficient Methods for Complex Systems.” The talks in these sessions focused on robust and efficient simulation of complex physical systems, e.g., governed by partial differential equations (PDEs). Such systems rely on highly efficient numerical methods that preserve underlying

structure, exploit low-dimensional representations, integrate data-driven or uncertainty-aware techniques, and explore mixed-precision and mixed-model computational approaches. This minisymposium brings together recent advances in structure-preserving discretizations, reduced-order modeling, uncertainty quantification, adaptive algorithms, learning-enhanced and mixed-precision solvers for challenging problems arising in fluid dynamics, wave propagation, transport-dominated systems, image reconstruction, and inverse problems. Here are minisymposium presentation titles and speakers (in the order of presentation):



- **Computationally Efficient Techniques for Bayesian UQ on Parametric Image Reconstruction**, *Andrea Arnold*, Worcester Polytechnic Institute, US; *Jimmie Adriazola*, Arizona State University, US; *Yinxi Pan*, Columbia University, US; *Fatma Terzioğlu*, North Carolina State University, US; *Misha E. Kilmer*, Tufts University, US.
- **Structure-Preserving Reduced-Order Modeling for Advection Dominant Equation Via Optimal Transport**, *Jingwei Hu*, University of Washington, US; *Fengyan Li*, Rensselaer Polytechnic Institute, US; *Zhaiming Shen*, Georgia Institute of Technology, US; *Shanying Tong*, University of Pennsylvania, US; *Yunan Yang*, Cornell University, US; *Jiajia Yu*, Duke University, US.
- **Efficient Low Rank Nodal DG Methods Accelerated Via Sketching-Based Summation of Tucker Tensors**, *Andrés Galindo-Olarte*, University of Texas at Austin, US; *William Taitano*, Los Alamos National Laboratory, US; *Jingmei Qui*, University of Delaware, US; *Joseph Nakao*, Swarthmore College, US; *Mirjeta Pash* and *Rudi Smith*, Virginia Tech, US.
- **Learning Locally Mass Conservative Solutions of Darcy Flows**, *Beatrice Riviere*, Rice University, US.
- **Truncated Kernel Windowed Fourier Projection: A Fast Algorithm for the 3D Free-Space Wave Equation**, *Nour G. Al Hassanieh*, Flatiron Institute, US.; *Alex H. Barnett*, Simons Foundation and Flatiron Institute, US; *Leslie Greengard*, Courant Institute, Flatiron Institute, and Simons Foundation, US.
- **On Corrections for Mixed Precision/Mixed Model Runge-Kutta Methods**, *Cesar Herrera Garro*, Purdue University, US; *John Driscoll*, *Sigal Gottlieb*, *Zachary Grant*, and *Tejsai Kaku-manu*, University of Massachusetts, Dartmouth, US; *Michael H. Sawicki*, University of Massachusetts, Dartmouth, US; *Monica Stephens*, Spelman College, US.
- **Validation of a Grid-free Framework for Numerically Simulating Flow Through Permeable Boundaries**, *Ricardo Cortez*, Tulane University, US; *Shilpa Khatri*, University of California, Merced, US; *Michaela J. Kubacki*, Middlebury College, US; *Kristin M. Kurianski*, California State University, Fullerton, US; *Brittany J. Leathers*, University of California, Merced, US; *Terrance Pendleton*, Drake University, US; *Wanda Strychalski*, Case Western Reserve University, US.
- **Adaptive Mesh and Algorithm Refinement: A Case Study**, *Ann S. Almgren*, Lawrence Berkeley National Laboratory, US; *Ana Djurdjevac*, Oxford University, United Kingdom.

Between the two minisymposium sessions on Monday, participants gathered for a **mentoring luncheon** that provided an informal setting for each mentoring group to discuss a shared set of career-development topics. All poster presenters, minisymposium speakers, panelists, poster judges, and AWM mentors were invited to participate. Attendees were also delighted to interact with the following AWM organization leaders: Darla

Kremer (AWM Executive Director), Raegan Higgins (AWM President), Cristina Villalobos (AWM President-Elect), Kylie Gibbard (AWM Development Director), Suzanne Weekes (SIAM Chief Executive Officer), and Jennifer Ryan (SIAM invited speaker).



A unique aspect of the mentoring luncheon was its multilevel mentoring model, which paired a senior mentor with an early career researcher to jointly mentor graduate students. In this structure, the early career researcher also received mentorship from the senior mentor, creating complementary layers of traditional and near-peer mentoring. **Special thanks to our senior mentors:** Ann S. Almgren (Lawrence Berkeley National Laboratory), Andrea Arnold (Worcester Polytechnic Institute), Kristin Kurianski (California State University, Fullerton), Fengyan Li (Rensselaer Polytechnic Institute), Beatrice Riviere (Rice University), and Qi Tang (Georgia Institute of Technology). And to our early career mentors: Nour G. Al Hassanieh (Flatiron Institute), Jack Coughlin (Stealth Fusion Startup), Andrés Galindo-Olarte (University of Texas at Austin), Joseph Nakao (Swarthmore College), Zhaiming Shen (Georgia Institute of Technology).

Tuesday morning began with the **AWM Career Panel, "Navigating Opportunities and Challenges in the Era of AI,"** chaired by Fengyan Li (Rensselaer Polytechnic Institute) and Joseph Nakao (Swarthmore College). The panel explored how the rapid advancement of artificial intelligence (AI) is shaping research programs and activities, education and training, and professional workflows in the mathematical sciences. Organized around three themes—workflows, research, and training and mentorship—the conversation brought together four panelists from different sectors and at different career stages to share their perspectives and experiences on the opportunities and challenges presented by AI. The four panellists were:

- *Ann S. Almgren*, Lawrence Berkeley National Laboratory, US
- *Jack Coughlin*, Stealth Fusion Startup, US
- *Beatrice Riviere*, Rice University, US
- *Qi Tang*, Georgia Institute of Technology, US

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The panel led to engaging discussions during the Q&A session following each theme. Junior researchers from the audience posed questions on topics including the appropriate role of AI in research, its impact on scientific publishing and peer review, and the changing landscape of entry-level employment. The panel concluded with each panelist offering one piece of advice to students and early career researchers considering careers in their respective sectors amid these rapid technological changes.

The **AWM–SIAM Sonia Kovalevsky Lecture** entitled *Spectral Problems in Inverse Scattering* was delivered by Fioralba Cakoni (Rutgers University) on Tuesday afternoon. The lecture was introduced by SIAM President Carol Woodward and chaired by AWM President Raegan Higgins. Professor Cakoni was honored at the SIAM Awards luncheon on Tuesday.

AWM workshop organizer Fengyan Li was also honored at the Awards Luncheon as a 2026 SIAM Fellow!

The **AWM minisymposium** for graduate students and recent PhD recipients on Tuesday evening was a great success. The session showcased exciting research by the presenters and generated lively discussions and enthusiastic engagement among presenters and attendees. The AWM poster presenters were:

- **Comparing Finite-Difference and Continuous Galerkin Methods for Atmospheric Dynamics: Idealized Numerical Experiments**, *Olayemi Adeyemi*, Boise State University, US.
- **Semi-Analytical Modeling of Shifted Generalized-Gamma Waiting-Time Distributions in Random Porous Media**, *Shomi Aktar*, University of Alabama, US.
- **Doubly Nonlocal Image Inpainting**, *Melissa De Jesus* and *Ciprian Gal*, Florida International University, US.
- **Water Flow in Porous Media**, *Stefanie Fazekas* and *Malgorzata Peszynska*, Oregon State University, US.
- **Spectral–Spatial Deep Learning for Hyperspectral Image Analysis**, *Sanaz Hami Hassan Kiyadeh*, University of Alabama, US; *Brendan Ames*, University of Southampton, UK.
- **Stability Analysis and Performance Evaluation of Additive Mixed-Precision RK Methods**, *Cesar Herrera Garro*, Purdue University, US.





AWM Graduate Student Poster Session
2026 SIAM Annual Meeting



AWM Graduate Student Poster Session
2026 SIAM Annual Meeting

- **Combinatorial Optimization Using Quantum Computing**, *Gloria Oppong*, University of Tennessee, Chattanooga, US.
- **Multiobjectivizing Nonlinear Single-Objective Optimization Problems**, *Ehsan Shams*, Alexandria University, Egypt.
- **Neural Networks with Local Converging Inputs (NNLCI) for Solving the Stokes Equations**, *Farjana Siddiqua*, Georgia Institute of Technology, US.
- **Mathematical Model Meets Conservation: Optimizing Invasive Species Management**, *Maheshi G. Walawwe, Lakmali Weerasena, and Jin Wang*, University of Tennessee, Chattanooga, US.
- **Reconstructing Incomplete Surface Temperature Fields Using Graph Attention Networks**, *Emma C. Weber and Dominique Guillot*, University of Delaware, US.
- **Discrete Superconvergence Analysis for Quantum Magnus Algorithms of Unbounded Hamiltonian Simulation**, *Jiaqi Zhang and Di Fang*, Duke University, US; *Yonah Borns-Weil*, University of California, Berkeley, US.

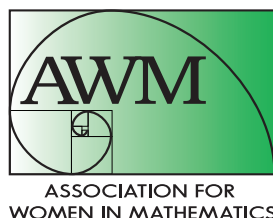


AWM Graduate Student Poster Session
2026 SIAM Annual Meeting

We congratulate all of the poster presenters and especially highlight the following three participants who won the **Outstanding Graduate Research Poster award**, after the conclusion of the AWM Workshop based on judge feedback and scores:

- *Melissa De Jesus*, Florida International University, US
- *Cesar Herrera Garro*, Purdue University, US
- *Jiaqi Zhang*, Duke University, US

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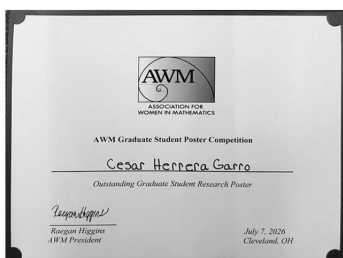
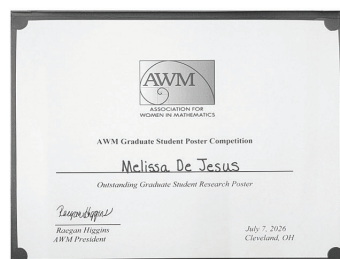
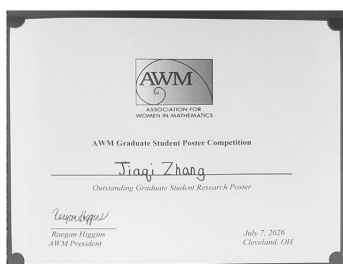
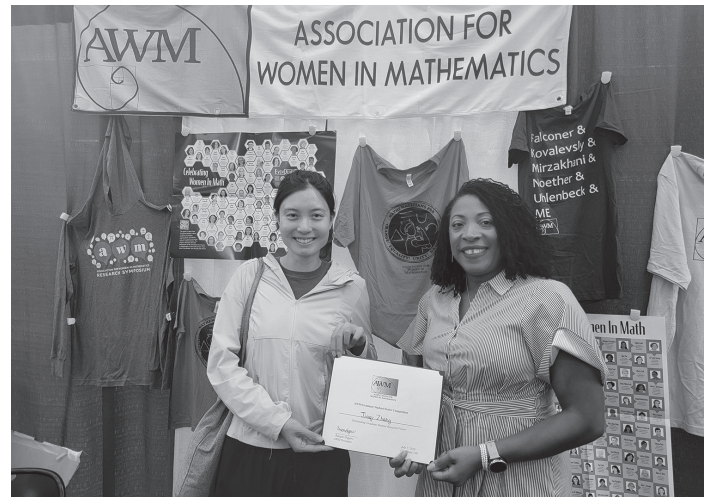


The **AWM Booth** was located in the main reception area, where coffee breaks took place, and it served as a hub to share information and promote opportunities for participation. It was also a place for community building, reconnecting with colleagues, and meeting new collaborators and mentors. At meetings where an AWM booth is available, we encourage participants to stop by, and to use it as a place to gather, share, and belong. Volunteering at the AWM booth offers a great opportunity to learn about the AWM and meet AWM members.

Special thanks to all of our AWM poster judges: Nour G. Al Hassanieh (Flatiron Institute), Andrés Galindo-Olarte (University of Texas at Austin), Fengyan Li (Rensselaer Polytechnic Institute), Joseph Nakao (Swarthmore College), Zhaiming Shen (Georgia Institute of Technology), Qi Tang (Georgia Institute of Technology).

Special thanks to the members of the AWM-SIAM Committee: Jamie Haddock (Harvey Mudd College), Darla Kremer (AWM), Lakeshia Legette Jones (Clark Atlanta University), Fengyan Li (Rensselaer Polytechnic Institute), Anna Little (University of Utah), Arnaja Mitra (University of Maryland, College Park), Jing-Mei Qiu (University of Delaware), Anna Zemlyanova (Kansas State University). We are grateful to the entire committee for contributing to the planning of AWM activities at the SIAM Annual Meeting, and we especially thank Jamie Haddock, the committee chair, for sharing many useful resources from their experiences organizing the recent AWM Workshops. We would also like to thank Lisa Dyson, Conference Director at SIAM, for her generous and patient support throughout the planning process.

Thank you to all who made the 2026 AWM Workshop a success, and we encourage those interested in numerical analysis and scientific computing to join **Women in Numerical Analysis and Scientific Computing (WINASc) Research**.



Get Involved! The AWM is a network of mathematicians who support women in the mathematical sciences, and all are welcome to join this community! To learn more about how to get involved with research groups, check out the AWM website (<https://awm-math.org/programs/research-networks/>). Don't see your research field? Consider starting a network. Do you attend SIAM conferences and are you interested in being a mentor or poster judge? Contact the AWM SIAM Committee chair. Social change doesn't just happen, and neither do the programs!

Editor's Note: In this article, page numbers of the book are referenced as [page number].

BOOK REVIEW

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

Gender Equity in STEM in Higher Education: International Perspectives on Policy, Institutional Culture, and Individual Choice

Hyun Kyoung Ro, Frank Fernandez,
and Elizabeth J Ramon, editors
Routledge, 2022
ISBN 9780367512934

This book includes thirteen chapters about the status of women in STEM in ten different places: China, Taiwan, the US, England, Chile, Germany, Kazakhstan, South Africa, Australia, and Hong Kong. It is divided into two parts, “Demographic Trends and National Initiatives,” and “Women’s Choice and University Contexts.” Of course, most of the chapters will address, to some extent, both perspectives. There is little about mathematics per se; most of the chapters emphasize engineering.

The book begins with an international viewpoint. The United Nations, in its 2030 Agenda for Sustainable Development, set targets to “ensure equal access for all women,” “eliminate gender disparities in education,” and “achieve gender equality and empower all women and girls.” The Organization for Economic Cooperation and Development more specifically calls for the end to gender disparities in STEM. In most parts of the world, women make up at least 50% of the enrollment in higher education. The growth of women’s enrollment in higher education has coincided with a decrease in the percentage of higher ed enrollments that are in STEM, often accompanied by an increase in business degrees. Unsurprisingly, women’s participation in STEM, particularly in engineering, is much lower than 50%.

While much of the experiences and causes are shared among these countries, I will mention some that seem to be specific to the country.

In China, the one-child policy contributed to the increase in women’s participation in higher education. The government has had an explicit policy of gender equality in education. Since the 1980s, China has set up a number of women’s universities. These have, in particular, helped to increase the participation of women students from rural areas. Besides a rural-urban gap, there are big differences in women’s participation in

different universities, with the elite universities in Beijing having particularly low percentages of women students. China has quotas for study in different fields, and these are high for STEM; perhaps this funnels into STEM some women who might prefer other fields. After university, women graduates in all fields are employed at only a slightly lower rate than men, but their salaries are lower. (Data for STEM graduates were not given.)

The chapter on the US focuses on women of color. “Black women’s participation in computer science, engineering, mathematics and statistics, and physical science, however, has declined over the past 20 years” [65]. The book mentions several national programs to increase minority participation in STEM, but, of course, these have all ended since publication. A major topic in the chapter is the “geography of educational opportunity.” A study in 2017 found that “more than half of college students enroll within about 20 miles of their permanent home address.” Some research shows this affects minority populations even more, because of supposed closer family ties [63]. Furthermore, many communities with large minority populations have limited four-year college and university options.

One of the factors that affect women’s STEM participation differently in some countries is early streaming in the educational system. From my personal experience I was familiar with this in England in the 1970s; since then there has been a major change in the school system there, but there is still specialization or divergence in secondary education. At the end of eighth grade students choose ten subjects to focus on, in preparation for national exams at the end of tenth grade. If successful, they can then choose to specialize in three or four subjects to study for the next two years in preparation for the “A-levels” which are used for admission to university with specific majors. There is little possibility for a student to change a general field of study after tenth grade. (Similar streaming occurs in Germany, Taiwan, and Hong Kong.) Lower percentages of women choose more advanced science options even at the first stage. While women on average score higher than men on A-levels, they have lower chances of pursuing STEM at university, and in particular, a lower chance of studying STEM at one of the more prestigious universities. Social class was also found to be a significant determinant of enrollment in STEM at universities.

The chapter on Chile focuses on the Facultad de Ciencias Físicas y Matemáticas (FCFM). This is part of the Universidad de Chile, but in spite of its name, it does not house the mathematics department (it includes a Department of Mathematical Engineering). About 20 years ago, women faculty at the FCFM formed an informal group, and eventually, they got into discussion with the leadership, resulting in some policy changes as well as more systematic mentoring. Since 2014 the FCFM has had an affirmative action program for admission of women into the

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undergraduate program. Students entering the FCFM are in a common core program before declaring their major in one of twelve departments. Then we see large differences in the percentage of students who are women, ranging from 40% in geophysics to 11% in electrical engineering. The activism of the women faculty also resulted in some programs to promote women at the graduate and faculty level. In particular, the faculty created a program of scholarships for women to pursue doctorates abroad with the promise of tenure-track positions after they complete their degrees.

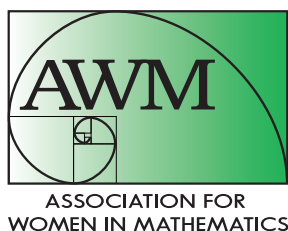
One chapter is about a country about which I know next to nothing: Kazakhstan. In the Soviet era, gender equity was promoted more than in other countries in the region. However, there are still different societal expectations about gender roles, and few women role models in STEM. Instruction in schools may be in Kazakh, Russian, or English. The chapter focuses on the School of Engineering and Digital Sciences at Nazarbayev University, where instruction is in English, and 75% of the faculty are from outside the country. (The university, founded in 2010 as the New University of Astana, was later renamed for the first post-Soviet president of Kazakhstan.) Enrollment by women varies significantly among the different engineering majors; 51% of students enrolled in the bachelors program in chemical engineering are women, while only 19% of students enrolled in the bachelors program in electrical and electronic engineering are women. There is greater gender parity in the PhD programs. The authors suggest this may be because more men choose to pursue the PhD abroad [149]. Girls from Kazakhstan are invited to participate in programs to encourage girls in STEM, including the Colorado STEM Summer Camp and TechGirls, the latter sponsored by the US Department of State [143].

Germany is another country where the transition from the Soviet era had an effect on participation of females in STEM. Before reunification, women in East Germany earned a larger percentage of engineering degrees than women in West Germany, although they were underpaid compared to men.

In South Africa, 82% of the population is Black African, 7% is white, and the remainder is “Coloured” (mixed-race) and Indian/Asian. Black Africans make up 20% of the registered professional engineers, and women less than 7%. Black Africans make up 20% of the professors at public universities, and Black African women make up 4% of professors at all universities [159]. Prior to 1994, nonwhites were not allowed to study or work at the main universities, except by special permission, and there were no engineering programs at Black institutions. Dorms at the University of Free State were segregated by race until 2008 [161]. A 2019 report documented persistent racism at the University of Cape Town. The authors interviewed 18 women with postgraduate degrees from historically white institutions. They reported on their educational experiences: encouraging high school teachers, but unwelcoming environment at university, and lack of mentors. They saw even white women in academia struggling, and recognized that a career in academia would mean staying in a predominantly white space. In general, they found industrial careers more attractive. It will take a long time to overcome the history of apartheid.

In some places in the book, statistics are presented ambiguously. When a percentage is given for women in a given field, is that the percentage of women students who are majoring in that field, or is it the percentage of students majoring in the field who are women? There are tables without adequate explanation of the data presented. (The worst case is Table 3.2, p. 38, on “Development of Self-Evaluation Ability of Science and Engineering Graduates by Gender at Peking University in 2018,” where means, standard deviations, maxima and minima, and T-test values are given, without the specific questions asked and without the scale for the answers.)

I had another problem with the book. Primarily in the chapter on Hong Kong, there is a lot of pedagogy/psychology terminology that is not explained. “The finding affirms the effect of personal conversion factors, which can be reworked by the emerging environmental factors of capabilities-functionings conversion, especially in view of the role model of women STEM teachers” [198]. What does this mean? But it was very interesting to read about the experiences in so many countries.



For the latest news, visit
awm-math.org

The Sylvia Bozeman and Rhonda Hughes EDGE Foundation Announces 2026 Karen EDGE Fellow and Ruskai Research Fund Recipients



The EDGE Foundation is delighted to announce Erica Graham as the 2026 Karen EDGE Fellow. The Karen EDGE Fellowship Program was established with a generous gift from Karen Uhlenbeck on the occasion of her 2019 Abel Prize. The Fellowship is designed to support and enhance the research programs and collaborations of mid-career mathematicians who are members of an underrepresented minority group.

Dr. Erica Graham is Associate Professor and Chair of Mathematics at Bryn Mawr College. Her research in mathematical endocrinology explores reproductive hormone regulation, with an emphasis on ovulatory dysfunction and the influence of other systems, such as metabolism and inflammation. She is a co-founder of the Mathematically Gifted and Black (MGB) website, which was recognized with the Association for Women in Mathematics Presidential Recognition Award. She is a dedicated mentor passionate about creating space and opportunity for broader entry into the mathematical sciences and is grateful to be a recipient of the Karen EDGE Fellowship.

For more information on the Karen EDGE Fellowship, visit <https://www.edgeforwomen.org/karen-edge-fellowship-program/>. To support the continued work of the Fellowship, donate here: <https://bit.ly/EDGE-donate>.



Dr. Erica Graham

The EDGE Foundation is Delighted to Announce the 2026 Class of Ruskai Fund Fellows!

The Mary Beth Ruskai Research Fund was established with a generous bequest from the estate of Mary Beth Ruskai. This fund is a testament of Beth Ruskai's dedication to increasing gender diversity and empowering women in the mathematics field. The Research Fund, which consists of two annual grants of \$5,000, is designed to empower women mathematical scientists.

Dr. Sarah Chehade is an incoming tenure track professor in the College of Engineering at the University of Houston, and a current technical project manager at the Washington Institute for STEM, Entrepreneurship, and Research (WISER). She received her Ph.D. in mathematics with a focus on quantum information theory from the University of Houston in 2021. Following this, she completed her postdoctoral research assistant appointment at Oak Ridge National Laboratory in the quantum computational science group, followed by a research appointment in the Quantum Center at the University of Tennessee, Chattanooga. Her research focuses on a mathematical understanding of quantum computational science, leveraging tools from operator theory, algebraic structures, and information science to understand fundamental quantum phenomena underlying entanglement, quantum computation and quantum dynamics.

Beyond her research, Dr. Chehade is deeply committed to workforce development and broadening participation in quantum information science. She works to connect mathematically talented students with emerging opportunities in quantum technologies, has organized several Women in Quantum Computing special sessions at the Association for Women in Mathematics (AWM) Research Symposium, mentored numerous young women in mathematics, and has been an active member of the EDGE Program since 2016.

Dr. Emily Heath is an Assistant Professor in the Department of Mathematics and Statistics at California State Polytechnic University, Pomona. She earned her B.A. in Mathematics from Occidental College in 2011 and her Ph.D. in Mathematics from the University of Illinois Urbana-Champaign in 2021. She was then a postdoctoral scholar with the NSF Research Training Group on Combinatorics, Computation and Application at Iowa State University.

Emily's research is in extremal combinatorics and graph theory, with a focus in Ramsey theory. She is passionate about mentoring and has supervised student research projects at her home institutions as well as through the Graduate Research Workshop in Combinatorics. In addition, Emily enjoys organizing conferences and workshops to bring together mathematicians at all stages of their careers.



Dr. Sarah Chehade



Dr. Emily Heath

EDUCATION COLUMN

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

Unreasonably Effective, Unreasonably Taught? The Case of Mathematics in Engineering

Yvonne Lai
Milton E. Mohr Professor, University of Nebraska–Lincoln

Every day, it seems like there is a call to change mathematics education. As one criticism goes, mathematics departments inevitably teach students that mathematics is useless and obscure. To cure this problem, mathematics courses could feature more applications—or even be organized exclusively around uses of mathematics. Moreover, because applications can motivate students, such a reform could improve both students' attitude and academic performance.

In this column, I examine the case for improving service courses, with a focus on prospective engineers. I argue that it may not be enough to know our own discipline and be familiar with those fields served by our mathematics courses. We as a mathematics community also need to grow networks to design activities that approximate the use of mathematics in other fields. Moreover, we need to develop teaching moves to

carry out these activities so that they at once hone students' mathematical understanding and are accurate to the field of application.

Unreasonably effective

When encountering calls for change, one might react with skepticism. Random walks relate to whether a districting map is fair. Ratios and proportions are used by nurses to titrate medicine. Solutions to inverse problems are used in making integrated circuits for semiconductors. In the words of Wigner (1960), mathematics is “unreasonably” effective in describing everyday and scientific phenomena (p. 2). Or, as Katherine Johnson said, “[T]here will always, always be mathematics. Everything is physics and math” (Deiss, 2020).

The unreasonable effectiveness of mathematics explains why many majors require mathematics: empirically, mathematics advances the work of many professions. Mathematics courses should be taught in mathematics departments, because mathematicians are experts at mathematics. It does not matter that most mathematics faculty know little about applications. Mathematics has long been useful; therefore, it will continue to be useful. If the students learn mathematics from those who specialize in mathematical structure, then skillful application will come.

The paradox of service mathematics courses

Even if professionals in other fields agree that *mathematics* is useful, it may have little to do with *mathematicians* or their teaching. I hear this at home; my husband is an engineer who has nothing nice to say about the mathematics courses he took.

AWM Travel Grants

Thanks to the generosity of private donors, the Association for Women in Mathematics will continue the AWM Travel Grant Program for Women, which has been in place since 1988, to support travel to domestic or foreign research conferences.

Travel Grants. Enabling women mathematicians to attend conferences in their fields provides them a valuable opportunity to advance their research activities and their visibility in the research community. Having more women attend such meetings also increases the size of the pool from which speakers at subsequent meetings may be drawn and thus addresses the persistent problem of the absence of women speakers at some research conferences. The Mathematics Travel Grants provide full or partial support for travel and subsistence for a single 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 \$2500 for domestic travel and of \$3500 for foreign travel will be funded.

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.

Deadlines. There are three award periods per year.

Deadline	For travel between
February 15	April 15 and January 15
May 15	July 15 and April 15
October 1	December 1 and September 1

This is not because he does not know mathematics, or because he finds mathematics useless. When I asked him for examples of why it is important for engineers to know mathematics, he had many. In testing whether a sensor was faulty or the readings signaled danger, he tromped across an icy field, gloves on, and sans calculator. He quickly determined—using ratios—that the sensor was wrong. His colleagues, who had a shakier grasp of proportionality, insisted that the entire system needed fixing, until he explained.

Across various stints—from installing HVAC systems to manufacturing carbon black—he used his understanding of calculus to work with readings from proportional integral derivative controllers. These controllers compare a target value (such as a desired room temperature) to the actual value (such as the temperature reading at a given time) and then determine the correction (such as whether to pump less heat or more heat) by integrating over past discrepancies in target and actual values and predicting future error using a derivative of the current discrepancy over time.

Mathematical thinking is needed in engineering, particularly the ability to express and interpret situations using mathematical notation and concepts.

I asked my husband where he came to appreciate mathematics. It was not his courses in mathematics; those obscured any actual utility. It was not until his engineering courses

and employment that he saw polynomials, integrals, and derivatives—among other concepts—as everyday realities.

This perceptual disconnect is not unique to my husband. Industry and academic engineers are so dissatisfied that they lobby to cut out mathematics departments so as to teach mathematics on their own (for one account of this, see Faulkner et al.'s [2019] introduction). The President's Council of Advisors on Science and Technology (2012) urged for the National Science Foundation to fund college mathematics curricula “developed and taught by faculty from mathematics-intensive disciplines other than mathematics” (p. vii). The American Society for Engineering Education's (2024) *Mindset Report* called for “alternative approaches” to mathematics requirements including “calculus sequences taught by engineering faculty” (p. 42).

The paradox of mathematics service courses is that though mathematics describes the universe, teaching mathematical thinking for its own sake can disconnect mathematics from everything else. As mathematics faculty we may not intend this; empirically, it is nonetheless too often the result.

Not all mathematical practice is created equal

If mathematics and its thinking have such “unreasonable effectiveness,” how can it seem irrelevant? One reason may be that “doing” or “using” mathematics shifts between domains. Even in

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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 undergraduate women 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 September 15, 2026. They must either be a US citizen or have a school address in the US. Up to three Schafer Prizes will be awarded at the Joint Mathematics Meetings in Chicago, Illinois.

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 and of students attending institutions with limited resources are especially encouraged. One letter of nomination (at most three pages) highlighting the exceptional qualities of the candidate to be recognized. The letter of nomination may include (but is not limited to) an evaluation of the nominee on the following criteria: quality of performance in advanced mathematics courses, special programs, or mathematical competitions; mathematical growth of the nominee; nominee's ability to overcome barriers in their mathematical journey; nominee's ability to seek out and make the most of resources both at and outside of their institution; ability for independent work in mathematics or ability to work equitably in a team in mathematics.

With the letter of nomination, please include a copy of transcripts that indicate expected graduation date. Any additional supporting materials (e.g. reports from summer work using math, copies of talks given, recommendation letters from professors, colleagues, etc.) should be included with the nomination. All nomination material is 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 **September 15, 2026**. If you have questions, phone 401-455-4042, email awm@awm-math.org, or visit <https://awm-math.org/awards/schafer-prize-for-undergraduates/>.

mathematics, each field has standard techniques that distinguish it from others.

The insularity of theoretical mathematical practice came to a head for me two years ago, when I attempted to teach mathematical modeling in a course for prospective high school teachers. I was motivated by multiple state standards calling for mathematical modeling, and that our program had no mathematics course for high school teachers featuring applications. There was one course where it seemed natural to try this out, and I asked to teach this course.

By this time, I had taught many proof-based courses, including for this audience. Despite my experience, I found myself baffled.

I thought about starting the course with a COMAP module *Modeling Pooled-Sample Testing, developed for high school students* (COMAP, 2022a, 2022b). Pooled-sample testing means that instead of testing individual samples for an infection, a laboratory tests a batch of samples. To determine the individuals infected, the laboratory might only request individual samples from those from a batch that tested positive. If the incidence of infection is low enough, then pooled-sample testing is more efficient than individual testing. At what incidence of infection would it be more efficient to do individual testing? How many individual samples should be pooled together? Would this depend on the

probability of infection? What combination of pooled-sample and individual testing is best, and under what conditions? The situation seemed to write its own questions, all worth exploring. According to the teacher's version of the module, the only prerequisites were "familiar[ity] with linear, quadratic, and exponential functions" and "finding the average of a dataset" (2022b, p. 2). I had high hopes that we could quickly run through the activity—where they analyze data from pooled-sample tests of Covid and analyze the efficiency of various protocols for disease testing—and then move to discussing more complex modeling, deeper mathematics, or teaching moves.

Optimism gave way to anxiety as I worked through the activity—from my perspective as one trained in theoretical mathematics. To truly understand the ideas underlying pooled-sample testing, a person would also need to know probability and expected value. Working with probability requires the inclusion/exclusion principle. But I wanted to teach through applications, and now I needed other applications before I could even get to the module. I designed activities involving drawing names out of a hat for gift exchanges, game shows, and lotteries. Now there were 20 pages of worksheets and exposition before the class could even begin pooled-sample testing.

When we finally reached the module, I felt disoriented when listening to the students. When I teach proof-based courses, I listen for potential conjectures, proof approaches, or whether nascent approaches hint at an unintended mathematical

CALL FOR NOMINATIONS

The 2028 Noether Lecture

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

The mathematicians who have given the Noether lectures in the past are: Jessie MacWilliams, Olga Taussky Todd, Julia Robinson, Cathleen Morawetz, Mary Ellen Rudin, Jane Cronin Scanlon, Yvonne Choquet-Bruhat, Joan Birman, Karen Uhlenbeck, Mary Wheeler, Bhama Srinivasan, Alexandra Bellow, Nancy Kopell, Linda Keen, Lesley Sibner, Ol'ga Ladyzhenskaya, Judith Sally, Olga Oleinik, Linda Rothschild, Dusa McDuff, Krystyna Kuperberg, Margaret Wright, Sun-Yung Alice Chang, Lenore Blum, Jean Taylor, Svetlana Katok, Lai-Sang Young, Ingrid Daubechies, Karen Vogtmann, Audrey Terras, Fan Chung Graham, Carolyn Gordon, Susan Montgomery, Barbara Keyfitz, Raman Parimala, Georgia Benkart, Wen-Ching Winnie Li, Karen E. Smith, Lisa Jeffrey, Jill Pipher, Bryna Kra, Birgit Speh, Marianna Csörnyi, Laura DeMarco, Anne Schilling, Neena Gupta, and Monica Vişan. The 2027 lecture will be delivered by Gigliola Staffilani.

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. A curriculum vitae of the candidates not to exceed three pages is also required. 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 **September 15, 2026** and will be held active for a total of three years (two years beyond the initial nominations). If you have questions, phone 401-455-4042, email awm@awm-math.org or see the website <https://awm-math.org/awards/noether-lectures/>

claim worth pursuing. When students disagree, I use intellectual conflict to sharpen definitions and lemmas. Through this kind of listening, I try to show what it means to do mathematics. What was I supposed to listen for here? When I listened for conjectures and definitions, I felt like I moved the class away from the most interesting questions the situation offered. When I tried to listen for situation-driven questions, I felt like I gave short shrift to the mathematical concepts. Trapped by these contrasting forms of mathematical practice, I likely showed neither well. Perhaps the mathematical practice that I held so dear had little to do with the mathematical practice—or teaching practice—for teaching or learning applications.

I am reminded of a passage from Henry Pollak's (2015) chapter, where he recalled being an invited guest for an AP Calculus grading session. A problem asked students to find the volume of a particular solid inside a unit cube using integration. One student had set up the integral correctly and then reported an answer several magnitudes of order too large. Graders debated whether he should receive one point less than the top mark, or only one point:

The two sides of the debate: (1) He set everything up correctly, he knew what he was doing, he made a silly numerical error, let's *take off a point*. (2) My God, he must have been sound asleep! How can a solid inside a unit cube have a volume in the millions? It shows no judgment at all. Let's *give him a point* (p. 268).

Pollak commented:

My recollection is that side (1) won the argument, by a large margin. But now suppose the problem had been set in a mathematical modelling context. [In] a mathematical modelling situation, pure mathematics loses some of its sovereignty. ... If the result does not make sense in terms of the original situation in the real world, it is not an acceptable solution. Now how would you vote? (p. 268)

One lesson that I learned from my semester clumsily attempting to teach applications is that it is not a direct transfer of my existing teaching or mathematical skills. I have time to amend some of my deficiencies before I next teach applications, but I will still be a novice.

Mathematical practice is not all created equal in that it is not equally applicable. The questions asked, and the assessments prioritized, depend on the goals. The goal of mathematical use may differ from the goals of learning particular mathematical content.

What are goals of engineers' mathematical practice?

As that term ended, I began wondering whether mathematical practice and teaching practice could explain the disconnect

problem in service courses. If mathematicians are teaching from one view of practice and client disciplines use another, the students are the only witness to both. But students are unlikely to already have insight to reconcile new-to-them ideas. The disconnect may only be magnified when students take a mathematics course prior to their major courses.

Tackling the mathematical practices of all possible client disciplines is too big. Engineering seemed like a strategic domain to understand, because it itself draws on many client disciplines, and because its foundations as a discipline are relatively stable; building design will likely always follow Newtonian mechanics. (It also helped that I had heard nearly a decade of laments from my husband.)

In early summer 2024, I informally interviewed six engineers, four of whom had some connection to the semiconductor industry, and whose backgrounds were almost all in mechanical or electrical engineering. When soliciting interviews, I explained my motivation to address disconnect between mathematics courses and engineering courses. In interviews, I asked: *What are examples of how mathematics is used in your field? Suppose you are guest speaking in a calculus class, and a student says that they know there are software and calculators to compute anything and they want to know what is the point of learning any calculus; what would you say? What is "mathematics" to an engineer?* I asked follow-up questions to try to get at characteristics of mathematical practice in engineering. As I began identifying features through initial interviews, I asked subsequent interviewees to help me revise my thinking on these themes.

They all agreed that engineers need to know mathematics. In answer to my question about the calculus student, one engineer said, "Not knowing calculus is a great way to get fired. Or to get your engineering ring revoked. You need to understand how to get that answer."

Across these engineers' examples, I was reminded of a definition of engineering given by the Royal Academy of Engineering: "Engineers make 'things' that work or make 'things' work better" (2014, p. 3). Here are the themes that I identified. I use pseudonym initials for engineers.

Continual vetting. One reason to know mathematics is to do "back of the envelope" computations to determine whether a plan or claim is plausible. One engineer, O, pulled up specifications they received from a vendor during our interview. O said that because they had done enough fast Fourier transforms by hand in school and early in their career, they could tell immediately that the frequency graph the vendor gave them "looked legit." As O bluntly put it, "When the company quotes a duration to us, are they bull—ing us, or are they being honest?" They pointed out, "It's not just about fleecing. It's also about whether an off-label use will be okay, especially when you're buying individual components for making a circuit. You might

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be assuming something about whether the component is being used in a particular way that the vendor didn't intend."

Another reason to use mathematics is to figure out whether something is broken. L told me, "One of the known things at [my company] was that the new engineers frequently got excited about numbers. But then these new engineers would fail the 'so what' test. The senior engineer ended up making it so that new engineers had to consult a statistician before you make a change. This kept the new engineers from responding to noise." L concluded, "A lot of mathematics is 'How much of something can you believe is real?' Computational tools have limits, and we need to be aware of them."

Mathematics is useful so that engineers can make judgments about whether to follow through on a potential plan. The questions framing the use of mathematics include, "Is the claim legitimate?" and "Is the intended use plausible?"

Determining the reason something is failing or how to improve something. If indeed there is something that is broken or that isn't performing well enough, engineers need to conduct tests to see how to fix it or make it better. From this perspective, mathematics is part of their toolkit to determine the cause. Engineer Z said that in their line of work, it often has to do with "diffusion, heat transfer, kinetics." Z explained, "Fluency in using these ideas is important for making a change. If they are technicians, who are simply using a piece of software, maybe fluency isn't as important, because they might just use trial and error. But instead of trial and error, if you tried to model what the choices are and what the likely outcomes are, this is more efficient." Here, the mathematics is used to identify cause and effect.

Describing systems in terms of mathematics and analyzing interactions. Several engineers emphasized that in the manufacturing process, there are not that many parameters that one can control. In the words of Z, engineers need to be "identifying constraints, looking at a system and how do I describe it in terms of math and putting it together to say 'this is a piece,' 'this is a piece,' 'this is a piece,' and know how to do the math with them, see them as math." As an example of working with constraints, H said, "One of the things that matters is that transistors have delays for propagating. When you add the delays, it needs to sum to something less than the clock cycle."

Or, as O described, "It's about modeling the data in an accurate way in your head. That's part of the problem with not understanding the algorithm is that you need to always go in with a hypothesis for what the answer is. If it confirms your hypothesis, great. If not, then you need to figure out what's going on."

Mathematics is used to represent systems, generate theories about how the system behaves, and to test those theories.

Computing and analyzing flow rates over time.

Almost all the examples given by these engineers had time as an independent variable. As L said, "Time is your ally and your enemy at the same time." Time interacts with chemical flow in a thermal reaction. Electrons flow over time to create current. I highlight this theme separately, even though it can be folded into the above goals, because it contrasts with guidance for teaching functions and quantitative reasoning in mathematics education. Time is so commonplace that it presents unique conceptual challenges relative to other variables, and learners' resulting reasoning can be closer to thinking about a single variable than relationships among multiple variables (Paoletti et al., 2016; Thompson & Carlson, 2017). When supporting students in coordinating behavior of more than one variable, Paoletti et al. (2016) recommend "(i) not requesting the students represent time as one of the two quantities under consideration and (ii) prompting students to graph relationships such that neither quantity monotonically increases" (p. 2).

For engineers, though, thinking about rates over time is crucial and common. In fact, when my colleagues and I discussed this issue with two engineering professors at our institution (one civil engineer and one mechanical engineer),¹ they had a hard time coming up with standard engineering examples that did not use time. They eventually thought of force-displacement relationships for springs and stress/strain diagrams. However, they emphasized that the most common graphs in engineering have time on one of the axes.

* * *

These purposes center systems outside of mathematics. L has a relative who is an algebraic geometer. When asked to define mathematics, this engineer said, "I think that if you asked [my relative], 'What is math?,' they would say something about building patterns and searching for beauty. But engineers look at math as a tool to control processes. How do you control something that you are trying to operate, to catalyze some change, or to keep from happening?" Mathematics is not something to study for its own sake or to refine; for engineers, its purpose is to be a means for solving problems outside of mathematics.

¹ Kristen Amman, Allan Donsig, and I are grateful for our engineering collaborators Libby Jones and Carl Nelson in this project; more on our project later in the essay.

² There are stories of mathematicians who assign research problems in homework, where sometimes a student—perhaps encouraged by not knowing that they are working on a problem that has stumped professional mathematicians—comes up with a solution and then authors a research publication. There are also courses that focus on developing students as researchers. My claim here is that a solution to a *typical* mathematics problem in the typical mathematics class does not result in potentially publishable results by the standards of research mathematics.

Professional view, instructional view

So far, I have represented professional viewpoints, in mathematics and in engineering. Improving courses involves teaching students who are not professionals, even if they intend to be one someday. When we as mathematics faculty teach courses, we do not assign research problems to our students.² The same is true in other disciplines. Engineering class activities may simulate aspects of being a professional engineer, but especially at the beginning, the activities are less complex and more predictable than what a professional engineer would encounter.

One challenge with teaching service mathematics courses is that they at best simulate mathematics use in engineering course activities, which themselves simulate actual engineering. It is not enough to know the discipline intimately. Faculty also need to develop appropriate and engaging approximations of the discipline.

The process of developing these approximations may initially need back-and-forth between mathematics and engineering faculty. As my colleagues Kristen Amman and Allan Donsig and I are discovering in our Project POME: Pedagogies of Mathematics in and for Engineering, we have a weak sense of what makes a mathematics problem authentic to engineering.

This is despite reading research and policy documents, attending an undergraduate engineering class once a week for three months, and talking with our engineering collaborators Libby Jones and Carl Nelson once a month over the past year.

In our last conversation with Carl and Libby, we examined calculus problems together. One problem compared the velocity of a sports car and a tractor over time. Libby and Carl both appreciated the context of vehicle trajectories. However, Carl pointed out, “Comparing a tractor and race car seems a bit canned. But we do have race car competitions, where some optimize for ruggedness or others optimize for endurance. You could compare Formula SAE car (optimized for speed on a track) with an electrical vehicle (optimized for endurance).” Even as he described this new scenario, the activity already seemed more promising.

We also discussed the classic optimization problem: maximize the volume of a box made by cutting out squares from the corner of a rectangle. Libby said, “To make this more ‘engineering,’ this could be a box manufacturer. [...] And you could have something later about cost constraints, like the cost of cutting, or the cost of disposing the scrap.” Their suggestions

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CALL FOR NOMINATIONS

The 2027 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, Lisa Fauci, Vivette Girault, Anne Greenbaum, Annalisa Buffa, Sunčica Čanić, and Fioralba Cakoni.

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 letter of nomination should outline the nominee’s contributions to applied or computational mathematics and provide a list of some of their most important research papers. This letter must be accompanied by a citation of about 100 words that may be read when introducing the speaker and a curriculum vitae of the candidate not to exceed three pages. 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 **September 15, 2026** and will be kept active for a total of two years (one year beyond the initial nominations).

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.

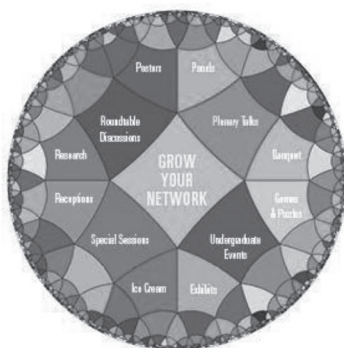
added a purposefulness to the problem contexts that was absent in the original. They approximated mathematics use in engineering more closely.

Even if there are better problems, curricula do not teach themselves. Instructors also need the skills, dispositions, and knowledge to teach those approximations effectively. This is especially true if they are teaching recitations or small sections, where their interactions can directly impact students. As Project POME is finding, teaching approximations may include perceiving accurately when a student is working on a problem ‘like a mathematician’ and when a student is ‘thinking like an engineer,’ and ultimately, teaching moves that help a student shift between these lenses (Amman, Donsig, & Lai, 2026). As my own foray into teaching mathematical modeling illustrates, knowing how to teach applications may not be automatic, even with mathematics teaching experience.

One theory of service mathematics courses is that if the instructor teaches the mathematics well enough, by the standards of the discipline of mathematics, the applications will follow from the unreasonable effectiveness of mathematics. This leads to unreasonably taught courses; the evidence suggests it is unreasonable to teach service courses following this theory. The unreasonable effectiveness of mathematics may say *why* mathematics service courses exist, but it does not say *how* to teach them. To improve service courses broadly, the mathematics community needs to develop knowledge for designing and teaching approximations that engage mathematics and its applications.

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Call for Special Sessions, Panels, Roundtables, and Other Events

The Association for Women in Mathematics (AWM) will hold its 2027 AWM Research Symposium at North Carolina State University in Raleigh, NC, on May 21–23, 2027. This symposium is not just a meeting but a platform to showcase your creativity, leadership, and passion for the mathematical sciences. It will feature plenary talks, special sessions on a wide range of topics, poster sessions, panels, roundtable discussions, a banquet, and numerous opportunities for discussion and networking. Proposals are welcome from any member of the mathematical sciences community on topics in mathematical science research, education, culture, or professional development. Events specifically for and by undergraduates are encouraged.

Submit your proposals through the Event Submission Form at <https://awm-math.org/meetings/awm-research-symposium/event-submission-form/>. Each proposal must include a title and description of the proposed event, along with a statement about how your session supports AWM's Commitment to Diversity and Inclusion. We value your unique perspectives and experiences, and we encourage you to share how your session will support this commitment in your proposal. Additionally:

Special Session proposals should include at least four speakers (the organizer may be one of them). These sessions are scheduled to accommodate four 20-minute talks. You may request up to two additional sessions on the submission form.

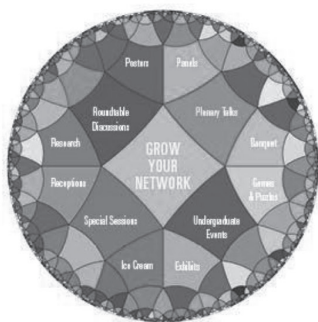
Panel proposals should include a moderator and three panelists. We welcome proposals from any member of the mathematical sciences community on topics of interest to a wide audience. These sessions are 40 minutes long, with at least 10 minutes devoted to audience questions.

Roundtable Discussion proposals must also include a moderator and two or three discussion leaders. Roundtable sessions are generally less formal than panels and special sessions. Thus, no audio/visual equipment is guaranteed. These sessions are 40 minutes long and are intended as small-group discussions on current topics.

Undergraduate Event proposals are welcome from any member of the mathematical sciences community on topics of interest to undergraduates. We strongly encourage undergraduate students to submit a proposal, as their fresh perspectives and innovative ideas are crucial to the future of our field. At least one member of the organizing committee must be a faculty member to ensure a supportive and inclusive environment for all participants. The time allotment will depend on the type of session proposed.

Other Events: Do you have an idea for an event that does not fit into one of these categories? Submit your proposal for the committee's consideration. A proposal should consist of a title, a summary of the session, necessary technological support and room arrangement, and other relevant information.

Submission deadline: Sunday, November 15, 2026



Call for Poster Presentations

The Association for Women in Mathematics (AWM) invites undergraduates, graduate students, and recent PhD recipients to present their research in a poster session at the 2027AWM Research Symposium at the University of Wisconsin in Madison on May 21–23, 2027. This meeting will also feature plenary talks, special sessions, panels, and roundtable discussions on a wide range of topics in the mathematical sciences, a banquet, and many opportunities for discussion and networking.

Eligibility: Applications are welcome from graduate students in the mathematical sciences or related fields, from undergraduate math majors who will be juniors or seniors in the Fall of 2027, and from mathematicians who have received their PhDs within approximately the last three years. All genders are welcome to apply.

Funding: AWM is actively seeking funding for participants. If successful, AWM will support travel for poster presenters without other sources of funding.

Apply here: <https://awm-math.org/meetings/awm-research-symposium/2027-rs-poster-application/>

All applicants are required to upload a letter of recommendation. Late applications and/or recommendation letters cannot be accepted. Decisions on applications will be made in mid March.

Application deadline: February 15, 2027

CALL FOR NOMINATIONS

The 2027 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 Kenshaft, Marie Vitulli, Erica Walker, Izabella Laba, Talithia Williams, Pamela Gorkin, Tara Holm, Bonita Saunders, Suzanne Weekes, Tatiana Toro, Deanna Needell, Olivia Prosper Feldman and Christina Edholm.

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. A curriculum vitae of the candidates not to exceed three pages is also required. 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 **September 15, 2026** and will be held active for a total of two years (one year beyond the initial nominations). 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.

Media Column Editors: Sarah J. Greenwald, *Appalachian State University*, appalachianawm@appstate.edu, and Alice Silverberg, *University of California, Irvine*, asilverb@uci.edu

Review of Emma LaPlace's “Year of Math 2026” Videos (Episodes 1–6)

Jessica K. Sklar, *Pacific Lutheran University, Tacoma*

As a professor who writes about math in popular culture, it is always exciting to come across a peer engaging in the same type of interdisciplinary scholarship. In recent years, several wonderful books in this area have been published, including Sarah Hart's *Once Upon a Prime: The Wondrous Connections Between Mathematics and Literature* (Flatiron Books, 2023) and Stephen Abbott's *The Proof Stage: How Theater Reveals the Human Truth of Mathematics* (Princeton University Press, 2023). A new addition to the field is Emma LaPlace's series of videos about math and theater, created as part of the Year of Math 2026's celebration of mathematics (theyearofmath.org/). During each month of 2026, LaPlace—whose doctoral dissertation, *Mathdramatics: Mathematicians in Plays*, is firmly in the intersection of mathematics and theater—posts a short video on YouTube (@Yearof-Math2026) discussing a mathematically themed play.

Unlike the deep-dive books listed above, LaPlace's videos are bite-size; each is only between two and four minutes long. This has advantages and disadvantages: math enthusiasts who grew up in a world rife with Instagram reels and YouTube shorts might gravitate toward these short-attention-span-friendly videos; however, there is not much time in any one video to discuss the work under consideration. Therefore, I approached each play discussion as either a fun reminder about a play I already know and love, or a teaser for a play I might want to see. Here I review the first six videos of the year.

Following an introductory video, LaPlace discusses five plays: in order, Tom Stoppard's *Arcadia*, Rinne Groff's *The Five Hysterical Girls Theorem*, David Auburn's *Proof*, Kefi Chadwick's *Mathematics of the Heart*, and Lauren Gunderson's *Emilie: La Marquise du Châtelet Defends Her Life Tonight*. In each video, LaPlace, sitting in front of a sparsely populated bookshelf curated to display her interests in theater and math, briefly describes the play and performs some excerpts of it, voicing all of the relevant characters. Her enthusiasm is clear, but in most videos all we visually get is LaPlace and her bookshelf, which feels a little dry. A notable exception to this is LaPlace's video on *Proof*, in which she films herself going to see the play at the Booth Theater on Broadway. I loved this

change; we get to see the outside of the theater, a maquette of the set design, the playbill, and the auditorium itself. This really added to my enjoyment of the video: I felt vicarious excitement, and it served as a de facto reminder of how much more exciting it is to see, rather than read or just listen to, plays. I hope that in future videos LaPlace adds some other things of visual interest: still photographs from performances of plays, of playbills, even of authors would help viewers see the plays as organic, living things. I would also love to see LaPlace invite a guest to join her so that the dialogues can actually be between two people.

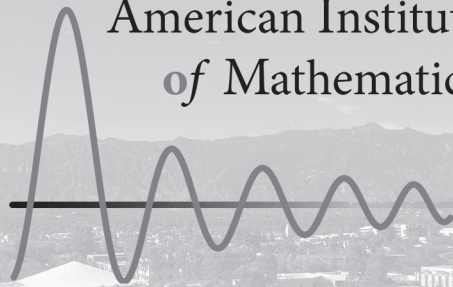
I admit that I find it difficult to separate my impressions of the video content from my feelings about the plays being discussed. As a long-term fan of both *Arcadia* and *Proof*, I enjoyed those videos a great deal. I also really liked the video on *The Five Hysterical Girls Theorem*; I haven't read or seen that play, but after watching LaPlace's video, I would jump at the chance to go see it (I admit that hearing that critics considered the math in it to be overly technical only served to further fuel my interest, since one of my greatest complaints is how often math in popular culture is simply a MacGuffin). All three plays engage deeply with mathematics: *The Five Hysterical Girls Theorem* contains clever inside jokes for mathematicians (e.g., the Seaside Inn is run by a Mrs. Hilbert), mathematics itself is an integral part of *Arcadia*, and *Proof* has important things to say about issues of gender bias within mathematical communities. (For an in-depth exploration of the latter two plays, see Sharon Alker and Roberta Davidson's chapter “Smart Girls: The Uncanny Daughters of *Arcadia* and *Proof*” in *Mathematics in Popular Culture* (eds. Sklar & Sklar, McFarland, 2012).)

I found the videos on *Mathematics of the Heart* and *Emilie: La Marquise du Châtelet Defends Her Life Tonight* less compelling. As far as I can tell from LaPlace's videos, math seems to play a less significant role in these plays, taking a back seat to romantic intrigues. I found some of the quotes from these plays off-putting; while I liked *Mathematics of the Heart*'s description of Gauss as the “Dark Prince of Mathematics,” I didn't understand why the word “Dark” was included (maybe that is clear in the actual play?), and in *Emilie*, the eponymous character's suggestion that “Maybe God's in the squaring” (presumably referring to the c^2 in Einstein's mass-energy equivalence) and the subsequent dialogue genuinely irritated me: while I can hear in my head an audience laughing at Voltaire's response, “God? We were doing calculus,” the whole exchange seems to me to be, basically, nonsense. I did find myself wondering why LaPlace chose to discuss these last two plays; perhaps it was because they were, like *The Five Hysterical Girls Theorem*, written by women, or perhaps it is just because she is fishing in a smallish pond.

I look forward to watching the remaining videos in the series, and hope we perhaps get another outing to a theater.

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The American Institute of Mathematics (AIM), at its new home on the campus of Caltech in Pasadena, California, sponsors activities in all areas of the mathematical sciences with an emphasis on focused collaborative research.

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



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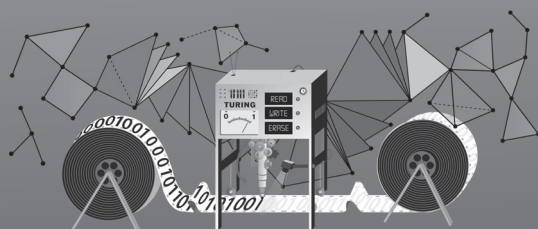
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www.awm-math.org/michlerprize.html



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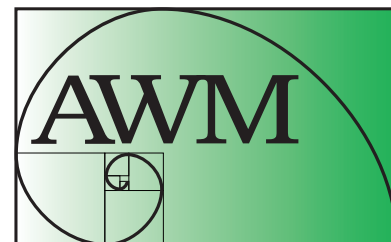
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AWM's membership year is from October 1 to September 30.

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