ASSOCIATION FOR WOMEN IN MATHEMATICS

Newsletter

VOLUME 56, NO. 4 • JULY–AUGUST 2026

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.

IN THIS ISSUE

PRESIDENT'S REPORT

Summer offers a different rhythm for many of us. Although research, advising, writing, and planning continue, the pace of campus life often shifts just enough to create space for reflection. For me, this season has brought repeated reminders of the people who shape our journeys long before conference talks, publications, or leadership roles enter the picture.

May was Teacher Appreciation Month, and this year I experienced it from multiple perspectives. As a board member of my daughter's school PTSA, I had the opportunity to organize activities recognizing teachers and staff throughout the week. Watching the joy, surprise, and genuine appreciation expressed by educators reminded me how meaningful even small acknowledgments can be. It also made me think about the teachers who shaped my own path, particularly my eighth-grade Algebra I teacher, the woman who first inspired me to love mathematics.

Like many students, I did not always see mathematics as something I naturally belonged in. What I remember most is not only learning algebraic concepts but also gaining confidence, persistence, and curiosity from someone who believed I was capable of more than I saw in myself at the time. Years later, when I completed my doctorate, one of the people I most wanted to contact was that teacher. Sending her my doctoral graduation announcement and a note of thanks felt like closing a circle that had begun years earlier in an eighth-grade classroom.

This time of year also coincides with graduation season, another reminder that academic and professional accomplishments are never individual achievements alone. Behind every graduate are teachers, mentors, advisors, colleagues, family members, and friends whose encouragement, patience, and investment helped make that moment possible. This month, I will watch my niece graduate from high school, a milestone that has prompted me to reflect on the many people who help students move into the next stage of their lives and education. In mathematics, especially, where persistence and confidence are often as important as raw talent, those relationships matter. This season also brings news of professional accomplishments across our community, including faculty members receiving teaching and research awards from their universities. These recognitions reflect not only individual achievement, but also the mentorship, collaboration, and sustained investment in students and scholarship that help mathematicians and our broader community thrive.

Recently, I also had the opportunity to serve as a panelist for the Region 17 Texas Council of Women School Executives Empowerment Luncheon. One of the questions we were asked was whether we had experienced imposter syndrome and, if so, how we worked through it as leaders. Every panelist answered yes, although one speaker reflected that she had experienced almost the opposite feeling. During the drive back to the office, I found myself thinking carefully about that distinction. For me, the challenge was not believing I was an imposter; it was often questioning whether I truly belonged.

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ASSOCIATION FOR WOMEN IN MATHEMATICS

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

The *Newsletter* is published bi-monthly. Articles, letters to the editor, and announcements are welcome. Authors sign consent to publish forms. The electronic version is freely available at awm-math.org.

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PRESIDENT'S REPORT *continued from page 1*

Belonging matters, and many students, educators, and professionals continue to navigate spaces where they are still trying to see themselves reflected and valued.

That understanding is central to AWM's mission and to the work many of our members do every day. Across classrooms, research groups, departments, outreach programs, and mentoring networks, AWM members continue to create pathways into mathematics and help others remain in the field during moments when they may otherwise question whether they belong. The impact of this work is often difficult to fully measure because it often occurs through conversations, encouragement, advocacy, and consistent support over time. Yet these moments can shape careers and lives in profound ways. Beyond supporting research and professional development, AWM helps create the sense of connection and continuity that sustains people throughout their mathematical journeys—through mentoring programs, research networks, student chapters, leadership initiatives, outreach efforts, and simply the relationships formed within this community. That work is especially important during periods of uncertainty and transition within the broader profession.

As our community celebrates graduates and looks ahead to a new academic year, we also continue to navigate a changing landscape in the mathematical sciences. Questions surrounding research funding, workforce stability, and broader policy decisions continue to affect hiring, research activity, and long-term planning across many institutions. Recent national conversations surrounding the leadership and future direction of the National Science Foundation, including the confirmation hearing for James O'Neill as nominee for NSF director, underscore the importance of stable and thoughtful leadership for the nation's scientific enterprise and the future of mathematical research and education. At the same time, professional organizations across STEM fields continue to advocate for sustained support of interdisciplinary research, including recent community efforts supporting the NSF Directorate for Social, Behavioral, and Economic Sciences and the broad scientific collaborations connected to its work. Rapid developments connected to data science and generative AI are also reshaping conversations about teaching, research, and professional practice.

Summer also brings important opportunities to gather as a community. This July, AWM joins the SIAM 2026 Meeting, featuring the AWM Research Network and Women in Numerical Analysis and Scientific Computing (WINASc). In August, AWM returns to MAA MathFest 2026, where Christina Edholm will deliver the AWM-MAA Etta Falconer Lecture. We hope to see many of you at both.

Even amid these transitions, summer remains a season of renewal. I hope you take the time to rest, reflect, and connect with the people that work and sustain you. Whether you are preparing a new course, mentoring a student, working on research, spending time with family, or simply taking a much-needed break, I wish you a rewarding and restorative summer.

Raegan Higgins

Raegan Higgins
Lubbock, TX
May 15, 2026

Maura Mast Named Next President of Seattle University

Maura Mast, a fellow of AWM and AWM clerk long ago, is the next president of Seattle University. A distinguished mathematician and leader, Dr. Mast began her academic career as a scholar of differential geometry and served as a tenured professor of mathematics at the University of Massachusetts Boston. She earned her Ph.D. in mathematics from the University of North Carolina in 1992 under Patrick Barry Eberlein.

During her career as an award-winning educator Mast has supported a range of initiatives to promote student learning and women's participation in the mathematical sciences. She is a Fellow of the Association for Women in Mathematics and co-author of the AMS/MAA Press award-winning textbook *Common Sense Mathematics*. Learn more at **https://www.ams.org/news?news_id=7667** and **https://www.seattleu.edu/newsroom/2026/su-names-new-president.php**

IN MEMORIAM
Joan Leitzel

Joan Leitzel, mathematician and educator, died March 5, 2026, at the age of 89. She received her PhD in 1965 from Indiana University Bloomington under the direction of George William Whaples. In 1965, Leitzel joined the mathematics faculty at the Ohio State University, where she later served as associate provost for curriculum and instruction. Her career included the National Science Foundation, provost and interim chancellor at the University of Nebraska–Lincoln, and president of the University of New Hampshire. For more, read the memorial tribute here: **https://www.ams.org/news?news_id=7648**

NSF-AWM Mentoring Travel Grants for Women

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

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

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

Deadline. There are now two award periods per year. Applications are due **February 15 and August 15**.

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Membership runs from Oct. 1 to Sept. 30
Individual: $70/$100 **Family:** $40
Contributing: $160/$190
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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.

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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

Addresses
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ASSOCIATION FOR WOMEN IN MATHEMATICS

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AWM DEADLINES

August 15, 2026: Deadline for AWM Workshop for Women Graduate Students at the 2027 Joint Mathematics Meeting Applications

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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BOOK REVIEW

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Gender Equity in Mathematics Education

Lutfi Incikabi, editor
IGI Global, 2026, ISBN 979-8337326658

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Published in 1994, *Failing at Fairness: How America's Schools Cheat Girls*, by Myra and David Sadker, documented gender bias in education through over 25 years of classroom observation. Their research found that teachers called on boys more often, gave different feedback by gender, and found gender bias in curriculum materials. Thirty years later, gender inequities in mathematics classrooms persist, contributing to the underrepresentation of women in fields such as physics, engineering, and computer science. However, the conversation has also shifted to include intersectionality, expanding the focus from equity for girls alone to creating inclusive mathematics environments for everyone, regardless of gender identity, race/ethnicity, and neurodiversity.

The 2026 edited volume *Gender Equity in Mathematics Education* consists of a collection of chapters that bring a global perspective to these issues. The volume is edited by Lutfi Incikabi of Kastamonu University. Contributors represent a diverse range of countries, including the United Kingdom, Uganda, India, Syria, Indonesia, and Turkey. The articles approach the broader issue of gender equity through multiple lenses, including rhetorical arguments, literature reviews, and statistical analyses. Most chapters also provide concrete reco mendations for best practices in mathematics classrooms, curriculum design, and parent education. An overarching theme throughout the volume is that countries with policies that actively support educational change tend to achieve better outcomes in gender equity.

Each chapter is followed by a comprehensive reference list, with most sources published within the last ten years, resulting in hundreds of references throughout the volume. Another valuable addition is the inclusion of "Key Terms and Definitions," which helps clarify important concepts for readers. Examples include "Inclusive Design," defined as the practice of creating digital learning tools that accommodate cultural, linguistic, and cognitive diversity from the outset, and "Gender Equity," defined as fair treatment, access, opportunity, and advancement for all genders while striving to eliminate barriers that have historically marginalized specific gender identities.

At times, the content feels repetitive, as many of the authors make similar arguments regarding gender inequities within mathematics classrooms. However, a newer and more compelling theme emerging in several chapters is the impact of digital learning and internet usage on mathematics achievement, particularly whether inequities exist in how technology is used and experienced across genders in educational settings.

The chapters present rhetorical arguments saying that gender disparities in mathematics are not the result of innate differences in ability, but rather the product

of social, cultural, and institutional structures that shape students' mathematical experiences over time. The book emphasizes how factors such as limited representation of women mathematicians in curriculum materials, competitive classroom norms, overreliance on timed assessments, and stereotype pressure collectively influence students' opportunities to engage meaningfully with mathematics. In this sense, gender differences are framed as emerging from context, expectations, access, and representation rather than from ability itself. Discussions of stereotype threat and math anxiety illustrate how performance can be affected by identity-related pressure and repeated exposure to implicit biases and inequitable classroom practices. Similarly, analyses of classroom participation point to how certain instructional environments may privilege speed, competition, or confidence over collaboration and reflective thinking, contributing to participation gaps over time.

Importantly, the book encourages readers to zoom out beyond classroom practice alone and consider broader societal and structural influences. The discussion extends to implicit bias, societal norms, structural barriers, and intersectionality, recognizing that students who belong to multiple marginalized groups may experience compounded disadvantages in mathematics education. As a result, the text ultimately argues that addressing inequities in mathematics requires not only instructional change, but also policy-level reforms and broader cultural shifts. While the book makes some broad claims that could benefit from more nuance, it presents a strong argument that improving equity in mathematics will require changes in teaching, as well as broader cultural and policy-level changes.

Stereotype threat is defined as the risk of conforming to a negative stereotype about a group to which one belongs. In mathematics achievement research, this refers to the possibility that students may underperform on standardized assessments when they belong to a group perceived as less capable in mathematics. While Steele and Aronson's 1995 study brought this concept to the forefront of educational research in relation to African American students, Chapter 5 examines stereotype threat among girls in Eastern African mathematics classrooms and the influence of parental beliefs. Using surveys from 390 randomly selected students and their parents, the study found that gender-based stereotype threat is strongly associated with lower mathematics achievement and that parental attitudes significantly shape these outcomes. Chapter 2 also examines stereotype threat, though the writing is often unclear and some claims are difficult to support, including a confusing reference to a "vaccination for gender gap at birth." At times, this chapter seems to overstate the impact of stereotype threat on girls, framing it almost as a mental health issue. Using a deep learning model, the study analyzed longitudinal data from 2013–2014 to 2024–2025 from more than 10,000 junior college students in India. The study examined math anxiety and performance scores, but it is unclear how these measures were collected or which assessment tools were used. Although the authors report percentages of stereotype threat and pre- and post-intervention results, the findings would be more meaningful if the intervention were more clearly defined.

Chapter 9 describes a study of 120 fourth-grade students in Indonesia who completed a numeracy assessment based on Bloom's taxonomy. The researchers found that all students demonstrated a gap between basic knowledge and creative problem-solving abilities. While overall gender differences were not significant, boys performed slightly better on basic numeracy tasks, whereas girls did better on open-ended problems. The authors concluded that girls tend to approach mathematical tasks more carefully, whereas boys often prioritize speed, and they suggested that teachers design assessments that accommodate both approaches. This study provides an example to future researchers of the types of studies that can be done with undergraduate and graduate students and can help influence their local school board or state/national curriculum.

One of the most compelling studies analyzed 2023 Trends in International Mathematics and Science Study (TIMSS) data from 13 European Union countries to examine the relationship between mathematics achievement, attitudes toward learning mathematics, and technology use. TIMSS, conducted every four years since 1995, provides extensive assessment and questionnaire data from students, teachers, parents, and schools. Their findings indicate that self-confidence in mathematics had the strongest correlation with achievement, a result supported by many previous studies. One interesting finding was that internet use was negatively correlated with mathematics achievement for both girls and boys, while teachers' use of digital technology had a significant positive impact for boys but not for girls.

To examine how these international perspectives connect to the US, we turn to data from the National Assessment of Educational Progress (NAEP), often referred to as "the Nation's Report Card," to explore recent trends in mathematics achievement. The trends in 8th- and 12th-grade mathematics over the past two decades both support and complicate earlier claims about equity. (See figures on page 6 for 90th percentile groups.)

Among students performing at the 90th percentile—often seen as representing the future STEM workforce in the US—these gaps continue to persist and, in some cases, are widening. From 2005 to 2024, Asian/Pacific Islander students consistently score the highest with a clear upward trend, while Black and Hispanic students remain substantially lower. Overall, the gap between the highest- and lowest-performing racial/ethnic groups appears to have grown slightly over time. Gender differences, by contrast, are smaller but still present.

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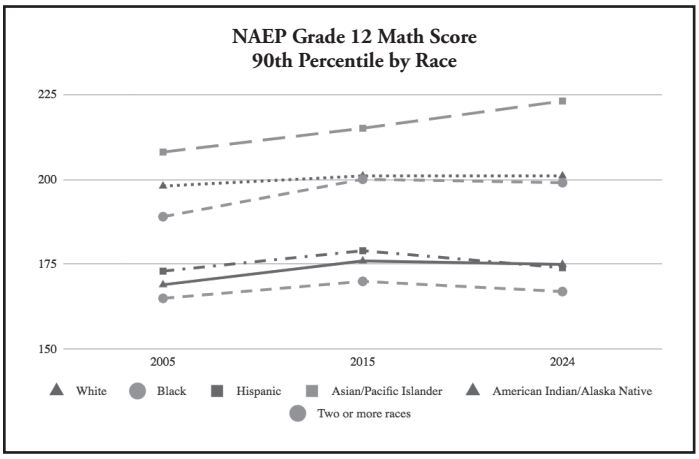
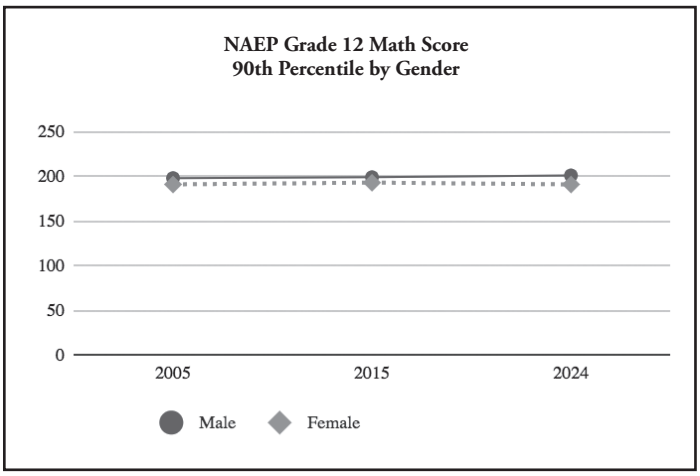
At the 90th percentile, for each year shown, the average of males' scores is slightly higher than that for females.





These figures suggest that while gender disparities remain a significant concern, racial and ethnic disparities in mathematics achievement are both more pronounced in magnitude and more persistent. In this sense, the NAEP data supports the book's broader argument that inequities in mathematics are structural and multifaceted—not only because gaps persist over time, but because they differ in size and trajectory across race/ethnicity and gender. The data also underscore the importance of explicitly addressing the intersections of race, ethnicity, and opportunity.

Because these disparities persist across multiple dimensions of identity and opportunity, the book's recommendations are both relevant and urgent. Across the chapters, the authors advocate for more equitable mathematics experiences through changes to instruction, curriculum, assessment, classroom culture, and institutional practices. Although many of the authors are writing from international contexts, most of the recommendations still seem highly relevant to the US context.

A major theme across the chapters is the need to rethink classroom practice. The book advocates for more collaborative learning environments, more inclusive language, and a stronger emphasis on growth mindset rather than fixed ability. It also stresses the importance of teacher preparation programs that help educators recognize implicit bias, reconsider assessment practices such as overreliance on timed exams, and design more inclusive curricula. Suggestions for teacher training include equitable questioning strategies and awareness of stereotype threat. The book also emphasizes representation, encouraging the inclusion of female mathematicians and stories of women's achievements in mathematics to provide students with more visible role models. In addition, it recommends that institutions track participation data more carefully so inequities can be identified and addressed more systematically.

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Sadker, M. and Sadker, D. (1994). *Failing at Fairness: How America's Schools Cheat Girls*, Charles Scribner's Sons.

Steele, C. M., and Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, *69*(5), 797–811.

TIMMS https://nces.ed.gov/timss/

Ruth I. Michler Prize

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

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

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

The application deadline is October 1 for the award to be used during the 2026–2027 academic year.

www.awm-math.org/michlerprize.html

Cornell University

AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM Workshop at JMM 2027

ASSOCIATION FOR WOMEN IN MATHEMATICS

Jane Street®

Application deadline: August 15, 2026

The Association for Women in Mathematics will host its annual AWM Workshop in conjunction with the Joint Mathematics Meetings in Chicago, Il from January 12–15, 2027.

FORMAT: The JMM workshop will include Special Sessions showcasing recent work by AWM Research Networks in **Symplectic and Contact Geometry and Topology (WiSCon)** and in **Topology (WiT)**. A **juried poster session for graduate students and recent PhDs**, a **professional development panel**, and a **mentoring luncheon** are all being organized by the AWM JMM organizing committee.

POSTER SESSION: The Poster Session is open to all areas of research; graduate students working in areas related to Symplectic and Contact Geometry or Topology are especially encouraged to apply. Poster presenters will be selected through an application process.

FUNDING: AWM will provide partial travel support to selected participants in the AWM Workshop, thanks to generous support from Jane Street.

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

All applications should be submitted to https://www.mathprograms.org/db/programs/1924 and include:

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

Applications must be completed electronically by **August 15, 2026**. See https://awm-math.org/meetings/awm-jmm/ for details.

MENTORS: We seek volunteers to act as mentors for graduate students as part of the workshop. If you are interested in volunteering, please contact the AWM office at awm@awm-math.org by **September 15, 2026**.

JUDGES: We also seek volunteers to act as judges for the Poster Session. If you are interested in volunteering, please contact the AWM office at awm@awm-math.org by **September 15, 2026**.

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GUEST COLUMN

Using Assessment to Increase Student Enjoyment and Success in Precalculus: Lessons from a Performance Task on Sunlight, Seasonal Affective Disorder, and Sine Functions

Gerunda B. Hughes, professor emerita, Howard University, gerunda.hughes@gmail.com

Introduction

Several years ago, when I taught a section of precalculus at Howard University, I set out to provide my students with an educational experience they would remember beyond the semester. My course goals were twofold. First, I wanted to improve the mathematics learning experience of African American college students, especially non-STEM majors, by using instructional and assessment strategies responsive to students' social, cultural, and cognitive experiences. Second, I wanted to contribute, even in a small way, to increasing the representation of African Americans in mathematics and STEM fields.

Background. Many students who enroll in mathematics courses view the subject as disconnected from their personal interests, academic goals, and future careers. I have found that this challenge is particularly significant among college students who are non-STEM majors. These students may see mathematics as a requirement to be completed in order to satisfy a general education requirement for graduation rather than a valuable tool for understanding their world. For African American students and other historically underrepresented groups, previous experiences with mathematics may also contribute to lower academic self-efficacy and persistence in mathematics-related fields. Consequently, mathematics educators across K–16 settings, in particular, must identify and use instructional strategies that increase student engagement, enjoyment, learning, and achievement while helping students at all educational levels recognize the relevance of mathematics in their lives.

In this article, I describe how one performance task using sunlight data, sine functions, and seasonal affective disorder (SAD) helped students experience assessment as a tool for learning rather than merely a measure of learning.

Use of Assessment in the Service of Learning

One promising approach involves the intentional use of a variety of assessment tools before, during, and after instruction. Assessment should not merely measure learning outcomes; it should actively support learning by providing feedback, guiding instruction, and creating opportunities for meaningful student participation. When assessment is integrated into instruction and connected to authentic applications, students are more likely to engage deeply with mathematical concepts, develop confidence in their abilities, and persist in mathematics courses.

Assessment Before Instruction. Pre-assessments can help instructors identify students' prior knowledge, misconceptions, motivations, interests, and attitudes toward mathematics before instruction begins. Diagnostic quizzes, surveys, interviews, and reflective writing assignments provide valuable information about students' strengths, areas of need, and past experiences in mathematics courses. In a precalculus course, a pre-assessment might evaluate students' understanding of functions, graphs, trigonometric relationships, and real-world modeling. Instructors can then use this information to tailor instruction and provide targeted support. Students also benefit because they gain awareness of their current level of understanding and can set personal learning goals.

Attitudinal surveys administered before instruction can be especially valuable. These surveys help instructors understand students' confidence levels, mathematical anxiety, and perceptions of the usefulness of mathematics. I conducted an attitudinal survey with my students to learn about their attitudes toward mathematics. We also had class discussions during the first week of classes to learn about what major areas of study students were pursuing. This type of information afforded the students an opportunity to get to know one another. We discovered there were students majoring in theater arts, psychology, sociology, English, political science, and business administration.

Assessment During Instruction. Formative assessment plays a critical role in maintaining student engagement throughout a course. Formative assessment is a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes. Examples of formative assessment tools include teacher-posed questions during instruction, small-group problem-solving tasks, reflective journals, peer review activities, and low-stakes quizzes. These assessment tools encourage active participation and allow students to make mistakes without fear of significant grade penalties. Frequent feedback helps students identify misconceptions before they become barriers to learning.

For several of the non-STEM students, the use of formative assessment tools created a more positive learning

experience and improved students' sense of academic self-efficacy. I intentionally incorporated students' interests and assets in the design of their performance tasks during our discussion of sine functions. Additionally, students reported greater enjoyment when they were given multiple opportunities and different ways to demonstrate knowledge and understanding of the learning objectives over the course of the semester.

Assessment After Instruction. Summative assessments, such as the departmental final examination which is developed by a committee of mathematics professors and required of all students in precalculus sections at the end of the semester, remain important because they provide evidence of student learning at the departmental level and, over time, can contribute to university-level accreditation purposes. End-of-course assessments can also include projects, presentations, portfolios, and performance tasks.

Performance-based assessments are particularly effective because they require students to apply mathematical concepts to authentic situations. Such assessments encourage critical thinking, problem-solving, communication, and creativity. They also help students recognize that mathematics is a powerful tool for understanding real-world phenomena.

A Mathematics Performance Task: Modeling Sunlight Data with a Sine Function

One particularly effective performance task in the precalculus course required students to collect, graph, and analyze data representing the average amount of sunlight each week in Washington, D.C., over a two-year period. As students analyzed their graphs, they observed that the amount of sunlight increased during spring and summer months and decreased during fall and winter months. This cyclical behavior made the data an ideal example of a sinusoidal function.

Connecting Mathematics to Psychology and Seasonal Affective Disorder (SAD)

An important feature of this performance task was its interdisciplinary connection to general psychology. A group of students enrolled in the precalculus course were simultaneously enrolled in an introductory psychology course. The sunlight data provided an opportunity to connect mathematical modeling with the study of seasonal affective disorder (SAD).

Seasonal affective disorder is a form of depression associated with seasonal changes, often occurring during periods when daylight hours decrease. Students learned that reduced exposure to sunlight can influence mood, energy levels, and overall well-being.

After providing feedback to the students about their graphs of the Washington, D.C., sunlight data, I contacted the professor of the introductory psychology course and asked if the students could share the results of their mathematics performance task during the discussion of seasonal affective disorder in the introductory psychology course. The professor agreed. To enhance their presentation, the students presented the results of a one-question survey on the incidence of SAD among their peers on campus. The survey asked: "To what extent do you experience changes in your mood, energy, or motivation during months with fewer daylight hours?" The students reported the percentage of peers who responded: (1) "a great deal,"

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CALL FOR NOMINATIONS

The Association for Women in Mathematics Dissertation Prize

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

To be eligible for the award graduate students must have defended their dissertation within the last two years (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.

(2) "somewhat," and (3) "not at all." The students also explained the relationship between the lowest points on the graph and months during the year when symptoms of SAD are most pronounced.

Several important lessons emerged from the students' experiences with the performance task involving sunlight and SAD: (1) students were more interested in learning about sine functions when they could connect the mathematics to observable seasonal patterns and human behavior; (2) linking precalculus concepts to topics studied in psychology helped students appreciate the broader applicability of mathematics; and (3) non-STEM majors, in particular, were able to demonstrate conceptual understanding, analytical reasoning, communication skills, and the ability to apply mathematics in a real-world situation. These lessons helped challenge the misconception among too many students that mathematics is relevant only in the STEM fields.

Conclusion

The use of diverse assessment strategies and authentic performance tasks has implications beyond a single precalculus course. The impact may be especially significant for African American students. Research consistently shows that a sense of belonging, relevance, and academic self-efficacy play critical roles in student persistence. When assessment practices provide frequent feedback and connect mathematics to meaningful contexts that interest students, students are more likely to view themselves as capable mathematics learners. In fact, an end-of-course survey in the precalculus section I taught revealed that 74% of the students recommended at least one small-group performance task be required for the course.

Performance tasks that incorporate culturally relevant and socially meaningful applications can further strengthen engagement. By demonstrating that mathematics helps explain issues related to everyday life, mathematics educators throughout the K–16 levels of education can help students see mathematics as a discipline in which they belong and can succeed.

Additional information can be found in the following articles.

Armour-Thomas, E., Darvin, J., **Hughes, G. B.** (2025). Assessment as a pillar of pedagogy in support of learning in AP research and mathematics education courses. In E. M. Tucker, E. Armour-Thomas, and E. W. Gordon, *Handbook for Assessment in the Service of Learning, Volume I: Foundations for Assessment in the Service of Learning* (309–340). University of Massachusetts Amherst Libraries.

Hughes, G. B. (2010). Formative assessment practices that maximize learning for students at-risk. In H. L. Andrade and G. J. Cizek (Eds.). *Handbook of Formative Assessment* (211–232). New York: Routledge.

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/.

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Joan and Joseph Birman Fellowship for the Advancement of Women Scholars

This $75,000 award is a midcareer research fellowship with the goal of advancing the participation and success of women in mathematics. This program is made possible by a generous gift from Joan and Joseph Birman.

For more information see:
www.ams.org/birman-fellow

Claytor-Gilmer Fellowship

This $75,000 award is given annually to further excellence in mathematics research and to advance the participation and success of Black mathematicians in the research community.

For more information see:
www.ams.org/claytor-gilmer

AMS Centennial Fellowship

This $75,000 award is given annually to an outstanding mathematician to help further their career in research.

For more information see:
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Stefan Bergman Fellowship

This fellowship annually awards $25,000 for the advancement of the research portfolio of a mathematician who specializes in the areas of real analysis, complex analysis, or partial differential equations.

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EDUCATION COLUMN

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

Academic Publishing, Gender Differences, Views of Higher Ed, and Impact of SoTL

Jackie Dewar, Professor of mathematics, emerita, Loyola Marymount University, Los Angeles, CA 90045

This column draws readers' attention to four education-related topics found in news articles and research reports published during the past year.

1. A Call for Radical Reform in Academic Publishing

On October 16, 2025, Cambridge University Press (2025) published a report titled *Publishing Futures: Working Together to Deliver Radical Change in Academic Publishing*. Based on input from more than 3000 researchers, publishing partners, librarians, and publishers from 120 countries, the report documents a variety of issues, including: phenomenal growth in submissions and publications, overwhelmed peer review systems, difficulties encountered with the transition to open access, widening equity gaps (authors without funding cannot publish and underfunded institutions cannot afford to pay for access to research), concerns about research quality, the impact of AI, and the financial unsustainability of the current model (libraries cannot afford the cost of subscriptions). Addressing these problems will require revamping how research is incentivized, produced, reviewed, and rewarded. The report recommends revising academic reward and recognition systems to value quality over quantity, support diverse research outputs, and acknowledge peer review as a core academic contribution deserving of reward within the research framework. I urge you to take a look at the report or the summary available in *Inside Higher Ed* (Palmer, 2025).

2. Early Math Instruction Found to Be a Contributor to Gender Differences in Math Achievement

For more than 50 years, the debate has raged over whether and why there are gender-differences in mathematics achievement. A recent paper on this topic published in *Nature* (Martinot et al., 2025) and reported online (Putol, 2025) fascinated me. The authors "observed a rapid emergence of a gender gap in maths favouring boys in all types of schools after only 4 months of schooling in first grade, irrespective of the children's age" (Martinot et al., 2025, p. 1026).

The four-year longitudinal assessment of language and mathematical performance of all first and second graders took place in France (2,653,082 children). At the beginning of first grade, French girls' and boys' math scores were essentially the same, but girls scored slightly better than boys in language. After four months of instruction, a small but significant gap favoring boys appeared in mathematics achievement. This gap continued to grow through the second and fourth grades. (In contrast, the gender gap in language diminished slightly after the first few months of school and remained relatively stable in later years.) As one of the authors explained, "The headline conclusion is that the gender gap [in mathematics] emerges when systematic instruction in mathematics begins" (Putol, 2025).

Further support in favor of the findings came from two unforeseen events that took place during the study:

(1) During the study, France increased the mathematics instruction provided in kindergarten classrooms. Researchers found that, with this increased instruction in kindergarten classrooms, the gender gap arose even earlier.

(2) With the disruption of in-class education due to COVID, researchers found that less time in school subsequently resulted in a smaller difference.

Now school systems need to ask hard questions about how math is taught in the early grades and what should be changed to make it more equitable.

3. Positive and Negative Views of Higher Education

Two national surveys conducted in fall 2025 reveal somewhat different views of higher education in the US.

Of the 3445 US adults surveyed by the Pew Research Center (Parker, 2025), 70% felt the US higher education system is headed in the wrong direction. Interestingly, college graduates were somewhat more likely than those without a college degree to share this view (74% vs. 69%). Respondents expressed concerns about affordability, career preparation, and free speech on campus. Higher ed received its highest ratings in this survey for its role in advancing research and innovation.

The American Higher Education Barometer, a much larger survey led by researchers at top universities (Lazer et al., 2025), revealed more positive views. A majority of the survey's 31,189 respondents recognized the value of universities and opposed federal funding cuts. They viewed education as crucial to science, technology, health care, and economic growth in the US. However, they too had concerns about costs, discrimination, and free speech on campus.

4. The Impact of the Scholarship of Teaching and Learning (SoTL) on Mathematics

Long-time readers of this column may recall previous occasions when I have written about SoTL (Dewar, 2007, 2012, 2015, 2018). Today, I call your attention to an open access article that I coauthored with Megan Breit-Goodwin and Ron Buckmire (Breit-Goodwin, Buckmire, & Dewar, 2025) on the value of SoTL to the mathematics community, which was published in *PRIMUS*. Motivated by a desire to better understand *Who, in mathematics, does SoTL?* and *Why they do it?*, we conducted an online survey in fall 2022. The survey population consisted of presenters in Contributed Paper Sessions on SoTL in Collegiate Mathematics at the Joint Mathematics Meetings during the years 2016–2020. The article (published as a Note) is a quick read, with the full study available online as supplementary material.

Among the survey results were: SoTL in mathematics is focused on the undergraduate classroom and its practitioners believe it can have a positive impact. In fact, 91% agreed and 9% somewhat agreed that SoTL had the potential to improve both teaching effectiveness and student learning, and that it had the ability to make contributions to the knowledge base related to teaching and learning. A high percentage of SoTL practitioners surveyed (84%) reported publishing their work, making it available for use by others. Taken together, these findings indicate that SoTL has great potential to enhance the teaching and learning of undergraduate mathematics, which would, in turn, benefit the mathematics community.

However, respondents felt more positive about there being sufficient opportunities to publish their SoTL work in journals on teaching and learning as opposed to mathematics or mathematics education journals. The article observed that "none of the three major professional societies in the United States serving four-year college mathematicians—the American Mathematical Society (AMS), the Mathematical Association of America (MAA), or the Society for Industrial and Applied Mathematics (SIAM)—sponsor a journal on mathematics education research or with a singular focus on the teaching of mathematics." In contrast, the American Statistical Association has sponsored a journal focused on statistics teaching and learning (*Journal of Statistics and Data Science Education*) for over 30 years.

Recognizing that, on occasion, the *Notices of the American Mathematical Society, College Mathematics Journal, The American Mathematical Monthly*, and *SIAM Review* do publish articles on the teaching and learning of mathematics, we explored what kind of articles have been appearing. Thanks to an effort spearheaded by Yvonne Lai (whom readers may recognize as a member of the Education Column writing team), the discipline of mathematics education (2020 MSC code 97) has been catalogued in MathSciNet since spring 2024. On June 30, 2025, we conducted a MathSciNet search of the four journals and found 22 articles coded as mathematics education. However, upon closer examination, only seven of the 22 discussed scholarly work on teaching and learning, and all

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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/

seven appeared in the *Notices* (but only two of those were in its Education section). The remaining 15 concerned mathematical content to teach, program level data or issues, or the results of math competitions. (For more details, see Appendix B.4.6 in the online supplementary material.) In the article, we urged "journals aimed at four-year college mathematicians with space already dedicated to education [like the *AMS Notices*] to be more proactive in seeking out articles about *scholarly investigations of teaching and learning* [emphasis mine] as a way to leverage the potential of SoTL to positively impact teaching and learning." We also suggested that "journals without such space consider dedicating some."

More on the beliefs, motivations, demographics, and career characteristics of SoTL practitioners in mathematics and how they compare with those doing SoTL in other fields can be found in the article.

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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

MEDIA COLUMN

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

Je suis Sophie Germain ("I am Sophie Germain")

Dora Musielak, University of Texas at Arlington, dora.musielak@uta.edu

Before Sophie Germain, no other woman mathematician had made significant contributions to both pure mathematics and mathematical physics. Her study of Chladni's vibrating plates led to the biharmonic equation and advanced the theories of elasticity and acoustics in the nineteenth century. Germain is the only woman in history who tackled the general proof of Fermat's Last Theorem, and in the process, she formulated an important theorem in number theory and conceived a special kind of prime numbers.

In France this year several events commemorate the 250th anniversary of Sophie Germain's birth. In 2021, Anne Boyé and Hervé Pajot produced a 15-minute film to honor her life and legacy, aptly titled *Je suis Sophie Germain* ("I am Sophie Germain"). In 2026, the International Mathematical Union and the May 12th coordination group brought attention to this video to expose Germain's story to a wider audience.

The video begins with a brief introduction of the protagonist, which is told in the voice of the mathematician herself using a non-diegetic sound heard over the images projected. Using this narrative subversion, Germain addresses the viewers directly in an informal tone and muses about the challenges she overcame growing up, especially when she decided to study mathematics. This presentation is told in a way that is bland and based on accounts that have been told about her and repeated since the late nineteenth century. Berlioz's *Symphonie fantastique*, Op. 14 subtly underscores the story.

For obvious reasons, this video uses narration to function as Germain's internal thoughts or reflections to bridge large gaps in time and content without needing extensive scenes. Germain tells the audience that she obtained the cahiers (published lecture notes from the École Polytechnique) and submitted her observations to Lagrange, professor at the École, using the assumed name Monsieur LeBlanc. She did not say how and when, nor what the nature of her written observations was, which must have been noteworthy. Lagrange's course in analysis must have been challenging for the students attending his lectures. His important *Théorie de fonction analytiques* appeared in book form in 1797, when Germain was twenty-one. His lecture notes of 1799 appeared in three forms between 1804 and 1808, in the Journal Polytechnique, and as a book with the title *Leçons sure le calcul de fonctions*.

In the video, Germain does not tell us how she learned the advanced mathematics to develop the analytical skills and the courage to submit her own work to Lagrange; such a daring act would be equivalent to acquiring class notes from an advanced university course in analytic functions and doing the required homework, without having attended high school!

Eventually, Lagrange discovered that M. LeBlanc was a woman. Impressed by her brilliance and resourcefulness, it has been implied that Lagrange became Germain's mathematical counselor. However, there is no evidence of this. Lagrange retired from teaching at the École in 1799 due to health reasons.

Occasionally, the mathematician's narrative in this video stops to allow the viewers to listen to the voices of others, including Gauss, Legendre, and Fourier. The message expressed by Gauss is full of adulation about her mathematical skills (text taken from a letter he wrote to Germain after discovering that the Monsieur LeBlanc who had communicated to him mathematical manuscripts was a woman).

The rest of the short movie continues in Germain's voice, addressing the viewer directly, drawing attention to her win (the prize of mathematics in 1816) and her unsuccessful work. The film is divided into five chapters, with Chapter IV devoted to Fermat's theorem, and Chapter V to elastic surfaces.

For audiences expecting details about what exactly she did in those areas, there is little on offer in this video. It is a pity that the script did not highlight the profundity of Sophie Germain's scholarly endeavors. In recent decades, historians and mathematicians have studied and discovered many important aspects of Germain's contributions to physics and mathematics. The published work could be used to strengthen this lovely homage video.

In telling a mathematician's story, we are challenged to balance historically accurate facts with glowing words to

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honor the contributions of the scholar, but sometimes this balance is not achieved, as in this case. It is our responsibility to portray Sophie Germain as a mathematician, highlighting aspects of the pure and applied mathematics that she pursued. In Chapter IV of the film, for example, it would be more interesting to emphasize that Germain took a completely new approach to proving Fermat's Last Theorem. Instead, the narration calls her work unsuccessful. This, unfortunately, is rather misplaced and erases her important contribution, especially when one hears the voiceover telling us that, "as you know, it was done by Andrew Wiles in the 1990s." Why, if Sophie Germain is telling her own story, presumably from the perspective of her own time, why would she refer to the unknown future?

What inspired Germain to study number theory? In 1798, Adrien-Marie Legendre published *Essai sur la théorie des nombres*. We can safely assume her curiosity for the theorem of Fermat was sparked by what she read in Legendre's *Essai*. He was examiner at the École Polytechnique. Then she came into possession of the *Disquisitiones arithmeticae* (Arithmetical Research), the masterpiece in number theory by Carl Friedrich Gauss published in 1801. She must have studied it thoroughly, learning the new methods and ideas introduced by Gauss, because in 1805 she began to correspond with him to share her own proofs, adopting his new congruence notation.

In the first letter to Gauss, Sophie Germain indicated that she thought she could prove the *théorème de Fermat*, the famous conjecture that $x^n+y^n=z^n$ is impossible for nonzero integral values of x, y, and z, when $n>2$. At that time, this was an open question since nobody knew whether Fermat's assertion was true (not until 1850 did it become known as Fermat's Last Theorem or FLT). Leonhard Euler had proved it for exponents $n = 3$ and 4. The next major step forward in the nineteenth century was due to Sophie Germain. In her first letter, she wrote to Gauss: "I think I managed to prove this impossibility for $n=p$-1, where p is a prime number of the form $8k$+7." She asked for his opinion, but Gauss did not provide it. Eventually, Germain must have discovered that initial attempt was flawed. Years later, around 1817–1818, she conceived a much more elaborated plan to obtain the full proof.

But the short video does not tell us this crucial part of history, nor explain the relevance and importance of her own theorem.

For two centuries, historians and mathematicians overlooked Germain's results. In 1825, Legendre had relegated her work to a footnote in the second supplement of the *Essai*. Yet, Germain had done much more than the proof that Legendre credited to her. And he knew that very well because she communicated her research to him. Gauss knew that as well, for in a letter in 1819, Germain outlined her plan for the general proof of Fermat's theorem. There is no record that Gauss replied.

To prove Fermat's conjecture in general, it is sufficient to demonstrate the impossibility of $x^p+y^p=z^p$ in nonzero integers x, y, and z, for any prime $p>3$. The theorem is traditionally split into two cases: Case 1, where exponent p does not divide xyz; and Case 2, where exponent p does divide xyz. Germain proved that, if p is an odd prime satisfying special conditions, then Case 1 holds for p, which she verified for $p<100$. Her efforts resulted in Sophie Germain's theorem. Today, a prime p is called a Sophie Germain prime if $2p+1$ is also prime.

In recent decades we have learned the extent of her monumental effort. It began with Sophie Germain's letters published by Andrea Del Centina in 2008; he examined the analysis in her enclosed notes which show how deeply Germain understood Gauss's *Disquisitiones* and mastered it long before any other mathematician. Her notes provide evidence of the results Germain obtained in the theory of power residues that had never previously been attributed to her. Working independently, R. Laubenbacher and David Pengelley studied in detail Germain's manuscripts and reconstructed her grand plan to prove Fermat's theorem. To date, Pengelley's scholarship provides the most comprehensive evaluation of Sophie Germain's contribution to proving Fermat's Last Theorem.

Chapter V of the short film is devoted to elastic surfaces. Again, the script glosses over the story, with Germain's voiceover just stating that "in 1815, I obtained the coveted prize" but does not tell the audience what she did to deserve it. However, this part of her scientific legacy must be retold to ensure that Germain's work in mathematical physics is properly credited. Let us begin with the prize competition from the Institut de France, which in 1809 issued the following challenge: "formulate a mathematical theory of elastic surfaces and indicate just how it agrees with empirical evidence [the motion and deflection of vibrating plates]." There was no mathematical formulation that could explain the patterns of moving sand on the nodal lines of a vibrating plate when excited at its resonant frequencies, as demonstrated by physicist Ernst Chladni.

In 1811, Germain submitted the only entry to the contest, but it did not win. She derived an incomplete fourth-order partial differential equation that yielded Chladni's patterns in several cases; unfortunately, she could not give a satisfactory derivation of the equation. Lagrange, a judge in the contest, determined that her hypothesis was correct and amended her equation. The contest was reinstated, in 1813 she submitted an improved memoir with the revised governing equation, and the judging panel concluded it was worthy of an honorable mention.

Once again, the contest was re-opened, and Germain (now 39) submitted a refined treatise, using the correct differential equation to model the deflection of a vibrating surface. On

8 January 1816, the Class of Mathematics and Physical Sciences of the Institut de France announced in its public meeting that Sophie Germain had won the *prix extraordinaire de mathématiques*.

What should have been Germain's greatest moment, however, turned into a bittersweet victory. She received a curt response from Siméon-Denis Poisson, one of the judges and her chief rival on the theory of elasticity, who wrote that her analysis still contained deficiencies and lacked mathematical rigor. Germain asked for clarification, but Poisson did not respond and avoided any serious discussion with her. He later published an equation similar in form to hers.

Nowadays, there is a consensus among many authors that Sophie Germain was truly the first to propose the correct hypothesis for the classical theory of thin plates, which resulted in the formulation of the time-dependent biharmonic equation we use now to calculate the transverse deflection of two-dimensional vibrating plates.

In 1815, the scientific community did not show the respect that was due to Germain, but we now recognize that her work signified essential progress towards the theory of elasticity and acoustics. Navier, Cauchy, and Poisson continued research in this area for many years after her. In 1850, Gustav Robert Kirchhoff found a complete solution, starting his analysis from Germain's equation.

Let us not forget that it was Sophie Germain who conducted the research and fundamental analysis that led to the development of that important equation that we use today in physics and engineering to calculate the deflection of vibrating plates. To be fair, it should be known as the *Germain-Lagrange equation*.

Sophie Germain earned the title of mathematician through her pioneering work in pure mathematics and mathematical physics. As isolated as she was, Germain rebelled by refusing to be simply curious about mathematics. With her distinctive research work and contributions to science and mathematics, she opposed the common belief of her time that women were not capable of independent scientific work. Sophie Germain forever changed the notion of the woman scholar, and for all that she earned the title of revolutionary mathematician.

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 Kenschaft, 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.

AWM Workshop at the 2027 SIAM Annual Meeting

Application deadline for graduate students: July 15, 2026

For many years, the Association for Women in Mathematics has held a series of workshops in conjunction with major mathematics meetings. The AWM Workshops serve as follow-up workshops to Research Collaboration Conferences for Women (RCCW), featuring speakers from one of the AWM Research Networks. An AWM Workshop is scheduled to be held in conjunction with the AWM Workshop at the Conference on Computational Science and Engineering taking place in Pittsburgh, February 22–26, 2027.

FORMAT: The workshop will consist of two research minisymposia focused on **Mathematical Biology** organized by Arnaja Mitra and Genevieve Stein O'Brien, a **poster session**, and a **professional development session**. The research minisymposia will feature selected junior and senior mathematicians from the Research Network Women in the Math Biology (WIMB). This workshop follows the WIMB workshop at ICERM, January 13–17, 2025.

POSTER SESSION: The poster session is open to ***all areas of research***; graduate students working in areas related to mathematical biology are especially encouraged to apply. Poster presenters will be selected through an application process to present at the workshop reception and poster session. The workshop will include a luncheon and a mentoring session where workshop participants will have the opportunity to meet with other AWM Workshop Participants and other scientists at all stages of their careers.

ELIGIBILITY: To be eligible for selection, a graduate student must have made substantial progress towards their thesis. All applications should be submitted to https://www.mathprograms.org/db/programs/1927 and include:

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

Applications must be completed by **July 15, 2026**.

MENTORS: We seek volunteers to act as mentors for graduate students as part of the workshop. If you are interested in volunteering, please contact the AWM office at awm@awm-math.org by **December 15, 2026**.

Departments are urged to help graduate students and junior faculty who are selected for the workshop obtain institutional support to attend. Eligible applicants are encouraged to apply for a SIAM Travel Award here: https://www.siam.org/conferences-events/conference-support/travel-and-registration-support/

2026–2027 Individual Membership Form

JOIN ONLINE at awm-math.org!

Please check the appropriate membership category below.
See below for payment methods.

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

The AWM Newsletter is published six times a year. I would like a paper copy* ☐

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

INDIVIDUAL DUES SCHEDULE

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☐ One year $170 ☐ Three years $510

Contributing membership (members earning ≥$90,000) (includes designation of a free student membership)

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PayPal: Use PayPal online at https://paypal.me/awmath let us know in the order detail which membership category you have chosen

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ASSOCIATION FOR WOMEN IN MATHEMATICS

Printed in the U.S.A.

ASSOCIATION FOR WOMEN IN MATHEMATICS

Volume 56, Number 4, July–August 2026

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