ASSOCIATION FOR WOMEN IN MATHEMATICS

Newsletter

VOLUME 55, NO. 3 • MAY–JUNE 2025

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

Last week, I visited Wichita State University for Sonia Kovalevsky Day and spent the day with a group of girls, some as young as third graders. My presentation included one of my favorite puzzles—the Towers of Hanoi—and we talked about how mathematicians study patterns to uncover general rules. During lunch, one of the third graders came up to me and asked, with bright determination: "Will you play the Towers of Hanoi game with me? I want to figure it out."

It was such a small moment, but one I've kept thinking about. Not just because she wanted to play a math game (though, of course, that warmed my heart) but because she was eager to figure it out—to look for structure, to test ideas, and to understand something deeply. That's what we do. And that's what we're passing on to the next generation.

As we approach the end of the academic year, I know many of us are stretched thin. We're grading, wrapping up projects, and looking ahead to summer. But we're also carrying the weight of a complex moment in this country—one in which education, equity, and scientific inquiry often feel like they're under pressure. Even so, our community continues to show up with clarity and resolve.

This spring, we celebrate the 2025 recipients of two critical national honors. The *Presidential Awards for Excellence in Mathematics and Science Teaching* recognize classroom educators who inspire students every day—building both skill and confidence. Meanwhile, the *Presidential Awards for Excellence in Science, Mathematics, and Engineering Mentoring* honor individuals and organizations whose sustained mentorship has opened doors for so many, especially those historically excluded from STEM fields. Among the individual honorees, 13 are women. We thank these awardees for their vision, their care, and their contributions to the scientific community.

This spring, we also mark the passing of Dr. Virginia Newell—a pioneering mathematician, educator, and civil rights advocate. Dr. Newell spent decades championing access to math education for Black students. She helped found the computer science department at Winston-Salem State University, where she mentored generations of students and later became one of the first Black women elected to the Winston-Salem City Council. Her legacy is one of scholarship, service, and community—and it continues to inspire us.

Next month, the University of Wisconsin–Madison will host our upcoming research symposium, which, for the first time, will include an entire day dedicated to undergraduate math majors. This welcomed, and timely addition reflects a shared commitment to nurturing early mathematical curiosity and helping students see themselves as part of the larger mathematical community. I hope many of you will be part of it.

Looking ahead, we're encouraged to see new proposals aimed at increasing participation and equity in STEM. These efforts align closely with AWM's mission: to create a community where women and girls can thrive in their mathematical endeavors, and to promote equitable opportunity and gender-inclusivity across the mathematical sciences.

continued on page 2

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.

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.

Circulation: 3500.

PRESIDENT'S REPORT *continued from page 1*

We'll be reflecting on how AWM can continue to support and amplify this important work. As I think back to that determined third grader and her puzzle-solving spirit, I'm reminded that mathematics offers not only patterns but also possibilities. Even in uncertain times, we're building something lasting—through our teaching, our research, our mentoring, and our care. Furthermore, she didn't ask for the answer—she wanted the *work*. And she wanted company as she figured it out. That's our community at its best: persistent, curious, collaborative—and always imagining a better future.

Raegan Higgins

Wishing you a peaceful and restorative summer,

Raegan Higgins
April 9, 2025
Lubbock, TX

2025 AWM Essay Contest

Congratulations to all the winners of the 2025 AWM/MfA Essay Contest! Many thanks to Johanna Franklin, Hofstra University, contest organizer, and to the other members of the committee, along with the many volunteer judges and interviewees. We are also grateful to Math for America for their sponsorship of this contest. The essay contest is intended to increase awareness of women's ongoing contributions to the mathematical sciences by inviting sixth-graders through college seniors to write biographies of contemporary women and individuals from gender identities underrepresented in the mathematics community who are mathematicians in academic, industrial, and government careers.

The 2025 Grand Prize essay appears after the list of this year's winners. To see the other prize-winning essays, visit https://awm-math.org/awards/student-essay-contest/2025-student-essay-contest-results/.

Grades 6–8

First Place

Contestant: Alan Zhang (Frances C. Richmond Middle School)
Title: *Bridging Worlds Through Mathematics*
Interviewee: Alena Erchenko (Dartmouth College)

Honorable Mentions

Contestant: Peter Holman (Frances C. Richmond Middle School)
Title: *Where Dreams Can Take You*
Interviewee: Kim Luke (Simbex)

Contestant: Pratistha Routray (DeWitt Middle School)
Title: *Dedication to Future Mathematicians*
Interviewee: Jennifer Lory-Moran (DeWitt Middle School)

Contestant: Aydin Soner (Homeschooled)
Title: *The Art of Storytelling in Biostatistics*
Interviewee: Melody Goodman (New York University)

Grades 9–12

First Place (and Grand Prize Winner)

Contestant: Vivian Huilin Liu (James E. Taylor High School)
Title: *Threads of Persistence: Weaving Life and Math Together*
Interviewee: Betul Orcan-Ekmekci (Rice University)

Honorable Mention

Contestant: Ena Bahk-Pi (Proof School)
Title: *Doc Durst: Breaking Barriers for Girls in Math*
Interviewee: Susan Durst (Proof School)

Undergraduate

First Place

Contestant: Iniobong Ofonime (New Jersey Institute of Technology)
Title: *The Power of Perseverance: Mahya Ghandehari's Story of Courage and Tenacity*
Interviewee: Mahya Ghandehari (University of Delaware)

Honorable Mention

Contestant: Fatemah Mirza (University of California, Los Angeles)
Title: *The Transformative Power of Determination*
Interviewee: Linnéa Gyllingberg (University of California, Los Angeles)

Grand Prize Winning Essay

Contestant: Vivian Huilin Liu (James E. Taylor High School)
Title: *Threads of Persistence: Weaving Life and Math Together*
Interviewee: Betul Orcan-Ekmekci (Rice University)

As is the case with nature, mathematics also sets in patterns: some well-seen, others more obscure, buried, waiting to be discovered. Dr. Betul Orcan-Ekmekci perceives mathematics not as rules but as a way of imposing coherence on an uncaring universe. It is this discipline that became a tool for her to understand the world and herself. Her story—from being a girl in Turkey, solving jigsaw puzzles as a child, to becoming a professor at Rice University—speaks to the beauty of persistence and the power of identity within a field that, more often than not, feels especially unwelcoming to women.

Betul's story starts in a small classroom in Turkey, where doing mathematics problems seemed like threading beads onto a string, with one piece clicking into place after another, forming something beautiful. "Math gave me confidence," she said. "It was like finding secret pathways in a forest, paths only I could see." Her aptitude saw her through the national exams, rigorous gateways to the top schools in Turkey. Many students dreaded them as barriers beyond which their dreams might not pass; for Betul, they were bridges leading to something better. She knew what she wanted: to teach, to share the joy of those hidden paths with others.

Her path took her to Boğaziçi University and then to the University of Texas at Austin for her PhD. The wider the horizon, the steeper the uphill climb gets, though. "In Turkey, I had always felt like I belonged in math," she said. But when she walked into those graduate classrooms in Texas, Betul felt the quiet weight of being a grad student. She had great role models and she was thinking that being a mathematician meant working hard all the time. She was trying to mold herself to that image. "I thought

continued on page 4

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

Institutional Membership Levels

AWM offers a tiered pricing structure for institutional memberships in six categories. Higher levels are:
Supporting Institutions: $750+ and
Sponsoring Institutions: $3000+
See awm-math.org for details.

Executive Sponsorship Levels

$5000+
$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

Addresses

Send all queries and all *Newsletter* material except ads and material for columns to Dandrielle Lewis, awmnewslettereditor@awm-math.org. Send all book review material to Marge Bayer, bayer@ku.edu. Send all education column material to Jackie Dewar, jdewar@lmu.edu. Send all media column material to Sarah Greenwald, appalachianawm@appstate.edu and Alice Silverberg, asilverb@uci.edu. Send all student chapter corner queries/material to Monica Morales-Hernandez, student-chapters@awm-math.org. Send ads and address changes to AWM, awm@awm-math.org. Send all Student Column material to Meghan Lee, meghanlee@ucsb.edu.

the problem was me," she admitted. "It wasn't until I stopped trying to fit into that mold that I realized how strong being myself was."

This was a period of introspection wherein Betul faced her toughest challenge: In the third year of graduate school, she came to know that her husband, Adem, and she were expecting their first child. "I was nervous," she said. "How could I be a mother with a PhD?" The equations she loved were simple, it seemed, compared to the question she now faced. But her mentor, the legendary mathematician Dr. Luis Caffarelli, reassured her: "You don't have to choose between being a mother and a mathematician." Those words were her lifeline on sleepless nights and days stretched long with research. "It was like walking across a narrow bridge," she said. "I didn't know if I'd make it to the other side, but I kept going."

Motherhood changed everything. "When you're caring for a newborn, the world narrows to the essentials," she said. "There's no room for pretense. It taught me to focus, to prioritize, and to see the beauty in small victories." Balancing the demands of academia and parenting often felt like navigating a storm, but Betul found support in unexpected places. Organizations like the Association for Women in Mathematics became an oasis. "At AWM conferences, I found women who understood," she said. "We talked about mathematics, but also about diapers and sleepless nights and about the question of whether we were doing everything right. It made me feel less alone."

Her work at the time echoed the complication of her life. She focused on partial differential equations, the mathematical motors that describe how heat diffuses, hurricanes form, and wildfires propagate. "Nature speaks with equations," Betul said. "The world may seem chaotic, but underneath, there's order." Her doctoral work involved modeling wildfire interfaces in random environments, capturing the unpredictable yet structured nature of these phenomena. "It was humbling," she said. "The equations reminded me that even in chaos, there is beauty."

But Betul's work is about more than equations—it's about people. As a professor at Rice University, she makes a place at the table for every student, particularly women and underrepresented minorities. "Math has traditionally been a gatekeeper," she said. "My goal is to turn it into a bridge." She tells her students to revel in their identity and to treat the very thing that makes them different as a strength rather than a burden. "Don't compare yourself to others," she tells them. "Your path is your own, and it's just as valid as anyone else's."

Her commitment to inclusion extends beyond her classroom. Betul mentors young mathematicians and collaborates across disciplines, using her expertise in PDEs to improve MRI technology and understand fluid dynamics. "Math connects everything," she said. "It's the thread that ties together different fields, different people, and different ideas."

On the other hand, Betul views the application of mathematics as endless. "The patterns we observe—from nature, human behaviors, or even art—are all connected," she said. "Math gives us bridges to find those connections, to bridge the gaps, and to solve problems not yet even imagined."

When asked what excites her most about the future, she smiled. "It's the unknown. Math teaches us that every problem has a solution—even when we can't see it yet. It's that reminder to keep looking, to ask questions, knowing an answer is out there somewhere."

The story of Betul is a strong reminder that identity and diversity are not barriers to success but form the bedrock on which it stands. In reaching motherhood through self-doubt to academic triumphs, she was molded into a mathematician who, instead of just looking at numbers, looks to the people behind them. She taught us that math is like life—it's about bringing order to messiness, building bridges across where there are none, and finding beauty in the patterns that connect us all.

"Math isn't just about solving equations," she said. "It's about finding your place in the world—and helping others find theirs."

ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM ONLINE

The *AWM Newsletter* is freely available online.

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

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

Media Coordinator
Kimberly Ayers, socialmedia@awm-math.org

AWM DEADLINES

AWM Travel Grants: May 15, 2025 and October 1, 2025

AWM Fellows: May 15, 2025

AWM Louise Hay Award: May 15, 2025

AWM M. Gweneth Humphreys Award: May 15, 2025

AWM Microsoft Research Prize in Algebra and Number Theory: May 15, 2025

AWM Sadosky Research Prize in Analysis: May 15, 2025

AWM Research Symposium Poster Presentations: June 15, 2025

RCCW Proposals: July 1, 2025

AWM Workshop at JMM: August 15, 2025

AWM-AMS Noether Lecture: Sept. 15, 2025

AWM–MAA Falconer Lecture: Sept. 15, 2025

AWM OFFICE

Darla Kremer, Executive Director
darla@awm-math.org

Samantha Faria, Managing Director
samantha@awm-math.org

Association for Women in Mathematics
Attn: Samantha Faria
201 Charles Street
Providence, RI 02904
401-455-4042
awm@awm-math.org

STUDENT COLUMN

Student Column Editors: Meghan Lee, Wake Forest University, meghanlee@ucsb.edu, and Nandhini Ravishankar, NC State University, nravish2@ncsu.edu

Hello! We are the new Student Column Editors for the AWM *Newsletter*, and we would first like to introduce ourselves and share a bit about our personal mathematical journeys.

Nan

Hey! I'm Nandhini, but I primarily go by Nan. I am a senior at North Carolina State University, majoring in Mathematics, with a focus in Economics and a minor in English. Outside of school, I spend most of my time doing production for my dance team, as well as watching TV/movies, reading and writing, and playing with my dog, Juno. I originally am from New Jersey, but I've lived in North Carolina for about eight years now, so my family is nearby (thankfully). However, I'm looking forward to applying to Master's programs outside of the state so I can expand my horizons and live alone for the first time!

I've always felt a disconnect between the mentality surrounding the study of mathematics, versus other topics. Most people, when hearing that one is a math major, say something along the lines of "Oh, I could never do that!" However, no one ever really has this reaction when they find out that I study English, or economics. The assumption that math is this complicated, untouchable subject, while other topics are much simpler and "for everyone," is simply not true. Anyone who has a diverse educational background can attest to the fact that every subject is easy and hard in its own right. Some English classes I've taken have been incredibly challenging, while some math classes, I find myself needing to put almost no work in. I find that this presumption about math being an incredibly obscure topic that only a rare, chosen few can comprehend causes people to run from the subject before they even really understand what they're studying.

I initially started off in college as an Economics major. However, as I continued studying, I realized that I was more curious about the calculations that we used in my econ classes, rather than the theory. While many people encouraged me to switch to math, I kept pushing it off, thinking that math was too hard for me. I switched hesitantly, but ended up falling in love with my math classes. The way that math can take such complex topics and put it into simple terms truly appealed to me.

Last year, I had the immense joy of being able to help out with a Sonia Kovalevsky day event at North Carolina State University. We organized workshops for middle school girls to come in and learn more about specific mathematical topics. Although the topics included were pretty complex—topography, number theory—they were broken down into the most basic explanations, in a way where everyone, no matter their age or experience, could understand it. This experience truly opened my eyes to how much more accessible math could be if more effort was put into explaining topics in a fun, simple way.

Overall, as I've delved more into my math journey, I've found myself consistently drawn to a diverse view and understanding of math, as well as ways to make that understanding more

continued on page 6

NSF-AWM Mentoring Travel Grants for Women *(New deadline added!)*

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 **February 15 and August 15**.

accessible to more people. My hope is for this column to be a direct reflection of that. I am very excited to co-edit this column, and hope to hear everyone's diverse, beautiful stories!

—Nandhini Ravishankar

Meghan

I'm Meghan, and I'm beginning a PhD in Mathematics at the University of California, Santa Barbara this fall. I'm graduating this semester from the master's program at Wake Forest University, and my current mathematical interests are in arithmetic and algebraic geometry. Outside of mathematics, I spend a great deal of my time reading books and poetry, writing, playing music, and visiting cafes. Additionally, since I grew up and went to college in Southern California, moving to North Carolina for my master's program was my first time living in a different part of the country. While living here, I've discovered a love for exploring the area by running and taking long walks outside.

The stereotype that it takes an extraordinary amount of innate talent to be a "math person" is all too familiar. Throughout college and graduate school, I have personally grappled with imposter syndrome, in part because of these commonly perpetuated ideas about what it takes to be mathematically talented.

My mathematical journey began in college with my first calculus class, which I took at Occidental College with Jeff Miller. I initially enrolled to fulfill a breadth requirement and keep other academic doors open—a serendipitous decision that ultimately introduced me to my chosen area of study. I had attended a STEM-oriented secondary school where, early on, students were sorted into distinct math tracks. Having been placed in a slower track, I long believed I wasn't naturally inclined toward mathematics like many of my peers. But during that first calculus course, I found myself uplifted by a collaborative community within my school's math department—one that challenged my preconceptions that mathematics (and success in it) is a purely individual endeavor.

Moreover, I grew to intrinsically appreciate how the study of calculus could be used to capture an instant, and I marveled at my professor's ability to convince me and my peers that the equations we were studying were beautiful in their own right. At this point, I still had doubts as to whether I'd be successful if I continued my math coursework beyond calculus—but because of the supportive community I had found, I felt empowered to try and encouraged that I could seek help when needed. Eventually, finding community led to my decision to major in mathematics.

Alongside my studies in college, I also worked in my campus newsroom. Here, I was able to witness firsthand how our stories shape our communities and how, in turn, our communities shape our stories. This, combined with my mathematical experiences, taught me how powerful it can be to feel seen and supported, and deepened my belief in the importance of creating spaces where people can share their journeys.

In this vein, I have always been especially interested in exploring the human sides of mathematics—how we experience, struggle with, and find meaning in it. I'm so excited to co-edit this column, and I can't wait to hear the stories you have to tell.

—Meghan Lee

Our Vision

As the language of proof and abstraction, we often think of mathematics as precise, rigorous, and seemingly objective. But our experiences within math are deeply personal, and the subject and the field are actively shaped by the people who belong to it

CALL FOR PROPOSALS

Research Collaboration Conferences for Women

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

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

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

today. We each arrive to the field while on our own paths, and we have been shaped by the moments—both big and small—that inspired, motivated, and challenged us.

This column is an invitation to explore those stories. We hope to create a space for students to reflect on what being in mathematics has meant for them. Maybe there was a time you weren't sure if there was a place for you in this field, or perhaps you've found a community or mentor that has helped you feel a sense of belonging. Maybe you're still searching for it. Whichever stage of your mathematical journey that you might be in, your story—whether it is of success, challenges, or perseverance—is valued and has a place in this broader dialogue.

It is crucial, especially in the current moment, that we critically examine, evaluate, and discuss how our identities—our gender identity, race, socioeconomic background, disability status, and more—shape how we move through and experience this field. Gender minorities' experiences in math do not exist in a vacuum. Rather, they intersect with other facets of our identities, and sometimes this can introduce challenges and barriers that are steeper or are not as visible to others who have not experienced the same things. We invite you to explore these questions as well.

Call for Submissions

Mathematics is more than just numbers, equations, and proofs—it is a deeply personal and evolving journey. Each of us arrives in this field from unique paths, shaped by defining moments of inspiration, challenge, perseverance, and transformation. One of our main goals with this column is to create a central space for students to share their story and contribute to a collective dialogue on what it means to navigate the world of mathematics.

We welcome submissions that reflect on your experiences within mathematics, or just as a student in general. Have you ever questioned your place in this field? Have you found mentors or communities that have helped you thrive? Are you still searching for that sense of belonging? Whether you are at the beginning of your mathematical journey or well along the way, your story matters.

We especially encourage reflections on the ways in which identity—gender, race, socioeconomic background, disability status, and more—shapes your experiences in mathematics. By sharing your perspectives, we can create a more inclusive and thoughtful conversation about our field and the people within it.

Your submission can take any form you feel the most represented in: personal essays, reflective pieces, creative narratives, drawings, multimedia pieces, or any other format that captures your story in a meaningful way. We seek to create a space where the personal and the mathematical intersect, fostering understanding and connection within our community.

We have compiled a list of guiding prompts and questions that we encourage you to think about while engaging with this column. Feel free to think about one, or several, or none at all if you'd rather pose and answer your own question—however feels most authentic to describing your own experience!

- What does it mean to belong in mathematics?
- What are the moments—big or small—that have stuck with you?
- Who is your mentor(s), or someone you admire? In what ways have they shaped your journey?
- How has math shaped your view of the world? How has your view of the world shaped your view of mathematics?
- Are there aspects of the culture of mathematics that have helped you succeed? Are there aspects you've found challenging or wished were different?
- What have been the parts of doing math or being in the field that have surprised you most?
- If you had the chance to travel back in time and meet yourself before your mathematical journey began—whenever that might be—what would be one piece of advice you would give yourself?

Whether you choose to engage with the column by sending in your own pieces, just sharing your thoughts, or simply reading and engaging with these ideas in your own life, we look forward to creating a community that is able to foster and support unique voices in Mathematics. We look forward to reading your stories and amplifying voices that make our mathematical community richer and more diverse. Your experiences deserve to be heard, and we are excited to share them!

—Nan and Meghan, Co-Editors

BOOK REVIEW

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

Carbon Queen:
The Remarkable Life of Nanoscience Pioneer
Mildred Dresselhaus
by Maia Weinstock
MIT Press, 2022, ISBN 978-0262046435

Reviewer: Barbara Lee Keyfitz, The Ohio State University (Emerita), keyfitz.2@osu.edu

When the first question you'd like to ask the author after finishing this book is, "Can you explain why the subject of your biography did not win a Nobel Prize?," that gives you a sense of how strongly Maia Weinstock has made the case for Millie Dresselhaus.

Mildred Dresselhaus was born in 1930 and lived until 2017; she lived in the Cambridge area from 1960 until the end of her life, working first at Lincoln Labs and then in the Electrical Engineering Department of MIT. Although AWM is not mentioned in this biography, AWM members of a certain age (mine, for example) living in the Boston area (likely) knew of her advocacy for women when AWM was founded in 1971. It's less likely that they knew of her research or of her background or of the reasons that her life trajectory was indeed "remarkable."

This excellent and very readable biography tells the story very well. Maia Weinstock is a science journalist who is currently Deputy Editor of *MIT News*. She has obtained information about Dresselhaus's life from a number of sources, including interviews with family members and with Dresselhaus herself, as well as from well-documented professional bio-sketches; and she has also given readable accounts of Dresselhaus's major discoveries. This is a scholarly work, with 67 pages of notes.

Weinstock gives a lively narrative about Dresselhaus's childhood, which, this reader agrees, was unusual. Her parents, Ethel and Meyer Spiewak, had emigrated to the US from Europe in the 1920's. They escaped pogroms but never found economic security in New York. Millie and her brother were born at the beginning of the Depression, and it seems that it was their musical talent that got them, as young children, scholarships to the Greenwich House Music School. It was a contrast to the poverty and crime of the only neighborhood the family could afford, and a source of information about opportunities. The story of her pre-college education is amazing. Her neighborhood school was "a farce," with no learning provided. Dresselhaus determined to win admission to Hunter College High School (the only public magnet high school in New York City that admitted girls at the time) by teaching herself all the material that might be on the entrance exam, on which she obtained a perfect score. While she took full advantage of this education and was already keenly interested in science, one notes that in the 1940s careers in science were not considered appropriate for women. She planned to become a mathematics teacher. One theme of the biography is that she was an excellent teacher, tutor and mentor. An anecdote about her early time at Hunter, when she initiated a chalkboard eraser fight in a classroom while the teacher was out of the room, is a reminder of how different were the expectations for children growing up in poor neighborhoods.

It wasn't until college that Dresselhaus begin to envisage a career in research. At Hunter College she met Rosalyn Yalow, later to win a Nobel prize but at that time a young lecturer with a PhD and serious research ambitions. She must have seen in the student some promise that may not have been apparent to the student herself. Dresselhaus gives Yalow credit for turning her focus to graduate school and to a research career.

Weinstock makes this into an exciting story, inspiring to anyone who has faced the same awakenings and similar choices in their life. Graduate school for Dresselhaus involved the same peaks and valleys that most AWM members have encountered: wonderful mentors; supervisors who actively discouraged women; research directions that ended up nowhere; serendipitous discoveries that changed one's career direction; and, in Dresselhaus's case, discoveries that changed many other people's scientific careers, and many aspects of modern life, as well. After a brief first marriage, she married a fellow physicist, Gene Dresselhaus, in what seems to have been a very happy and harmonious union. They had four children, maintained substantial collaborations, thrived in rewarding jobs near each other, and received, separately and together, substantial recognition for their research, teaching and service. (You know the drill.)

Weinstock has worked hard to explain Millie Dresselhaus's scientific contributions, and one can tease out a bit of their significance from the summary. I emerged with the feeling that to say someone is an "experimentalist" is an oversimplification. For example, in her PhD research, Dresselhaus created experiments to investigate "electromagnetic properties of superconductors." Superconductivity is the property of a material to conduct electricity with practically no resistance: an electrical impulse in such a material could travel almost forever without further input. The term "superconductor" is applied to materials which acquire this property below a critical temperature (typically 1 or 2 Kelvin). In the early 1950s little was known about this phenomenon; since then superconducting materials, particularly high temperature superconductors, have become important in technology. (High is a relative term here; anything above -196°C can be cooled by liquid nitrogen, so that's considered high enough.) Dresselhaus investigated what happens near the transition temperature when a magnetic field is applied. At a high enough magnetic field, superconductivity disappears, but Dresselhaus found that it does so in an anomalous way, increasing slightly before decreasing to zero. This contributed to development of the BCS theory of Bardeen, Cooper and Schrieffer, who later, in 1972, won the Nobel Prize for it.

Dresselhaus did not continue to work on superconductivity, but turned her attention to something completely different: carbon. Weinstock comments on an amusing thread here.

No one was working on the electronic structure of carbon, because it seemed intractable and possibly because no one saw much scientific or commercial interest in it. Dresselhaus was in the midst of beginning her marriage, settling into a house, and starting a family, and, according to an interview with Harry Kroto (a Nobel Prize winner for the discovery of buckminsterfullerene, related to this research), she was happy to find a difficult problem where she didn't have to face a lot of competition or race against time. The biography makes it clear that she was extremely talented at designing and conducting experiments and her talent lay as well in an ability to conceive of critical questions to ask in motivating the experiments.

The nature of carbon, and the myriad structures that could be created with carbon (often mixed, or "intercalated" with other elements or compounds) occupied Dresselhaus for the bulk of her career. She was involved in the isolation (or perhaps it should be called invention) of graphene, a layer of carbon that is one atom thick and yet is so strong that nothing can penetrate it. It is the basis of carbon nanotubes which have made possible electronic devices such as smart phones and, it appears, just about everything we use in modern life. Much of her work was joint, and she seems to have been very generous in sharing credit. And although she was never recognized with a Nobel Prize, she won many other awards. Towards the end of her career, she was the sole winner of the 2012 Kavli Prize in Nanoscience "for her pioneering contributions to the study of phonons, electron-phonon interactions, and thermal transport in nanostructures." (She donated the million-dollar award to a fund for up-and-coming scientists.)

Weinstock's book also documents Dresselhaus's extensive involvement with advocacy for women. There are stories about her mentorship of specific people, and also about her concern to make MIT a more inviting place for women. I enjoyed reading about her happy interactions with her children and grandchildren. The endnotes are careful enough that I was able to look up references and videos. One minor quibble: When a reference is cited more than once, only the first citation is complete, and one may have to search through the notes to find the complete citation. Only sometimes is the reference something publicly available, which of course is fine, but I would have appreciated a separate list of all the multiply cited references.

As for the question with which I began this review, I still wonder. Of course, there are many possible explanations: Dresselhaus's contributions were fundamental to many achievements that were rewarded with the prize, but in each case one could make the claim that her work stopped short of the "killer" result. Maybe that's the reason. Or maybe her work could be seen as closer to engineering than to science (if there is a distinction). But is there still a prejudice that women just do not reach that pinnacle? It seems that Dresselhaus herself did not care. There is no evidence of her ever harboring a bitter thought or saying a bitter word. And good for her.

NSF-AWM Travel Grants for Women

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

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

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

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

2026 AWM Prizes and Awards Call for Nominations

Nominations for the following AWM prizes and awards will be accepted between April 1 and **May 15, 2025** on mathprograms.org and will be presented during the Joint Prize Session at the Joint Mathematics Meetings in Seattle in 2025.

2026 Class of AWM Fellows

The Association for Women in Mathematics Fellows Program recognizes members of any gender who have demonstrated a sustained commitment to the support and advancement of women in the mathematical sciences, consistent with the AWM mission: "to 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." For more information visit https://awm-math.org/awards/awm-fellows/.

2026 Louise Hay Award

The Louise Hay Award for Contributions to Mathematics Education recognizes outstanding achievements in any area of mathematics education, to be interpreted in the broadest possible sense. The annual presentation of this award is intended to highlight the importance of mathematics education and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being. For more information visit https://awm-math.org/awards/hay-award/.

2026 M. Gweneth Humphreys Award

The M. Gweneth Humphreys Award recognizes outstanding mentorship activities. This prize is awarded to a mathematics teacher who has encouraged women undergraduate students to pursue mathematical careers and/or the study of mathematics at the graduate level. M. Gweneth Humphreys (1911–2006) taught mathematics to women for her entire career, first at Mount St. Scholastica College, then for several years at Sophie Newcomb College, and finally for over thirty years at Randolph-Macon Woman's College. This award, funded by contributions from her former students and colleagues at Randolph-Macon, recognizes her commitment to and her profound influence on undergraduate students of mathematics. For more information visit https://awm-math.org/awards/humphreys-award/.

2026 AWM Microsoft Research Prize in Algebra and Number Theory

The AWM Microsoft Research Prize in Algebra and Number Theory highlights outstanding research by a woman in Algebra or Number Theory. Made possible by a generous contribution from Microsoft Research, this prize has been awarded every other year since 2014. For more information visit https://awm-math.org/awards/awm-microsoft-research-prize/.

2026 AWM Sadosky Research Prize in Analysis

The AWM Sadosky Research Prize in Analysis highlights outstanding research by a woman in Analysis. The award is named for Cora Sadosky, a former president of AWM and made possible by generous contributions from Cora's husband Daniel J. Goldstein, daughter Cora Sol Goldstein, friends Judy and Paul S. Green and Concepción Ballester. For more information visit https://awm-math.org/awards/awm-sadosky-research-prize/.

Student Chapters Chair: Monica Morales-Hernandez, student-chapters@awm-math.org

This is my favorite EvenQuads card! What is yours?—DU AWM Student Chapter Members posing for a group photo. Back row (left to right, ending at the pillar): Casey Schlortt, Anika Navarro, Brendan Dufty, Eden Ketchum, Luke Hetzel, Jordan Koler, Kaya Wright, Justin Lui, Vanessa Duong. Front row (left to right): Molly Zheng, Tsering Phuntsog, ?, Janelyn Geronimo, Anh Tran, Ashley Alfaro, Lucy Chan, Achisa Panichakul, Vien Phan, Mei Yin, Mandi Schaeffer Fry, Sid Lalgowdar, Shirui Liu

University of Denver AWM Student Chapter Hosts EvenQuads Event

Casey Schlortt, President of the AWM Student Chapter at the University of Denver

During the Fall 2024 quarter, our University of Denver (DU) Chapter of AWM participated in the nationwide call to update the biographies of the women featured on the EvenQuads card decks. Our chapter researched many of the notable women mathematicians from EvenQuads decks 1 and 2 to learn about their new accomplishments, work, and awards. Our chapter members were greatly inspired by the lives of these women mathematicians, so we decided to host another event featuring EvenQuads in the winter 2025 quarter, where chapter members would learn how to play the actual card games.

On a snowy Friday in late February, we hosted an EvenQuads game afternoon in partnership with the DU Math Club and DU chapter of the Society of Asian Scientists and Engineers (SASE). We had a wonderful turnout despite the snow and split into two groups (one for each card deck) to play the EvenQuads game. While the game moved somewhat slowly at first as we tried to get a handle on the rules, soon the game went quickly with students and faculty calling out quads. As students and faculty won quads, some faculty told stories from heartwarming personal interactions with some of the women on the cards. Many women on the cards were recognized by our chapter members, some from their contributions to their fields, and some from the research we had conducted last fall during the first EvenQuads event.

Let us call out quads!—Capturing a moment of excitement. (Clockwise around the table, starting at lower left corner) Erinn Schlortt, Sid Lalgowdar, Ashley Alfaro, Casey Schlortt, Mandi Schaeffer Fry. (Background, left to right) Tsering Phuntsog, Molly Zheng

Overall, this was such a unifying and enlightening afternoon. Not only did we celebrate the accomplishments of women in math, but we also met members from other STEM organizations at our school and shared our missions with each other.

Lastly, we would like to note that our University of Denver Chapter of AWM was founded by Professor Mei Yin in 2016 and 2025 marks the ten-year anniversary of our chapter! During these past ten years, our chapter has received a lot of support from the nationwide AWM network as well as locally from our College of Natural Sciences and Mathematics leadership, in particular from our chair Professor Alvaro Arias and our associate dean Professor Nicholas Ormes. Thank you all for your kind support!

EDUCATION COLUMN

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

Encountering AI in Our Professional Work

Jackie Dewar, Professor Emerita of Mathematics
Loyola Marymount University, Los Angeles, CA 90045

Artificial Intelligence (AI) is making great inroads into every part of our daily and professional lives. A recent *Inside Higher Ed* column[1] provided a succinct summary of some of the latest developments and what capabilities to expect in the near future. Without a doubt, faculty are encountering opportunities and new frontiers when it comes to AI use in teaching, research, and service. The 2025 Joint Mathematics Meetings adopted the theme "Artificial Intelligence: We Decide our Future. Mathematics in the Age of AI."[2] Mathematics professional organizations are responding in various ways to inform and assist their members. The Mathematical Association of America has been offering workshops on the "promises and challenges" of teaching with AI. The Society for Industrial and Applied Mathematics recently hosted a workshop for professional advancement for those interested in applying machine learning and AI in their career. An internet search will turn up other workshops and presentations sponsored by the American Statistical Association and the American Mathematical Association of Two-Year Colleges. In the March–April 2024 issue of the *Newsletter*, this column included an article by Jo Hardin[3] encouraging readers to consider using generative AI when learning something new, so as to understand better what students experience. The American Mathematical Society (AMS) has developed a white paper titled "Equity, diversity, inclusion, and artificial intelligence: Issues for mathematicians to consider"[4] *that everyone should read*. It mentioned several possible (and potentially problematic) uses of AI that had never occurred to me such as, "finding and evaluating people, including hiring and promotion; identification of speakers; selection of undergraduates for opportunities; and reading applications for graduate schools."

When it comes to publishing mathematical books or articles, policies vary on whether and how AI can be used, and whether its use needs to be acknowledged. Some journals/publishers have detailed policies on the use of AI by authors that are easy to find on the internet. Among these are: The AMS,[5] AWM's *La Matematica*,[6] SIAM (all journals),[7] Taylor & Francis (publisher of *PRIMUS* and other math journals).[8]

Yet, on February 20, 2025, when I visited some journal websites, and looked at "guidelines for authors," nothing was mentioned in those guidelines about using or not using AI, not even a link to the publishers' policies. Examples of these were *PRIMUS* (published by Taylor and Francis) and the *AMS Notices*, though presumably the policies of the publishers available elsewhere apply to submissions to those two journals.

Referring to the use of AI, websites often state "policies are subject to change." Indeed, over the course of several weeks writing this article, I noted one such change on a major publishers' website, from a specific statement not to use AI when writing abstracts for chapters in a book to a much more general statement that—upon several moments' reflection—still seemed to imply AI could not be used for that task.

Further complicating matters, avoiding the use of AI can be a bit challenging now that AI tools are embedded in software products that we use a lot when writing. Previously, most of us likely used the built-in spell-check and grammar-check features, without giving it a second thought. Now these tools may be AI-based.

Many of us are finding it helpful to ask an AI tool to help draft the wording for classroom worksheets or assignments for certain courses, or the language for a cover email for a research survey. Later, when writing up the results of a scholarly investigation involving that course will we need to remember and acknowledge whether we used AI to help with the wording on the worksheets, assignments, or that email?

AI offers us new, powerful tools that can be put to good use, but it brings us challenges and potential pitfalls, including staying informed about policies related to its use in publishing.

---

[1] https://www.insidehighered.com/opinion/blogs/online-trending-now/2025/02/19/thinking-out-loud-ai

[2] The meeting theme strongly influenced the theme of the 2025 AMS Special Session that Curt Bennett, Lew Ludwig, and I co-organized, titled: AMS Special Session on SoTL: Connecting Generative AI and Scholarly Inquiry to Improve Teaching and Learning (see https://jointmathematicsmeetings.org/meetings/national/jmm2025/2314_progfull.html for links to the abstracts of the papers presented).

[3] https://awm-math.org/wp-content/uploads/2024/03/AWM-News-March-April-2024-WEB.pdf

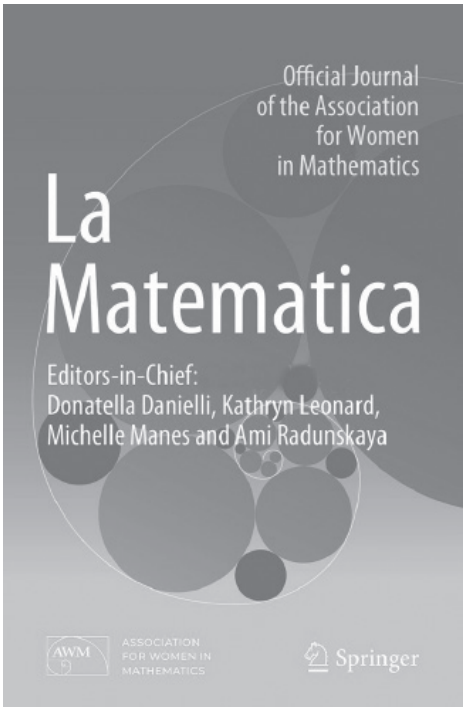
[4] https://www.ams.org/about-us/white-paper-ams-committee-on-EDI.pdf

[5] https://www.ams.org/publications/journals/policies/UseofArtificialIntelligence

[6] https://link.springer.com/journal/44007/submission-guidelines

[7] https://epubs.siam.org/artificial-intelligence

[8] https://taylorandfrancis.com/our-policies/ai-policy/



La Matematica, the Official Journal of the AWM, Wants to Publish Your Work!

The AWM launched its flagship journal, *La Matematica*, in 2021, and we are looking for your submissions! *La Matematica* is an international, doubly anonymous peer-reviewed journal that features high-quality research from all flourishing of all mathematicians by adopting equitable practices in STEM publishing. The journal seeks to publish a variety of article types in all fields of mathematics (pure, applied, and computational) and considers full-length research articles and short communications that describe new theoretical results and innovative practical applications.

Interested in submitting? You can learn more about *La Matematica*'s scope and find out how to submit your research by visiting https://link.springer.com/journal/44007. For questions, please contact the journal's publisher representative, Anna Lombaro, at anna.lombardo@springernature.com.

Editors-in-Chief: Donatella Danielli, Kathryn Leonard, Michelle Manes, and Ami Radunskaya.

ADVERTISEMENT

AWM Workshop at the 2026 Joint Mathematics Meetings

Application deadline for graduate student poster session: **August 15, 2025**

For many years, the Association for Women in Mathematics has held a series of workshops in conjunction with major mathematics meetings. The AWM Workshops serve as follow-up workshops to Research Collaboration Conferences for Women (RCCW), featuring both junior and senior speakers from one of the AWM Research Networks. An AWM Workshop will be held in conjunction with the Joint Mathematics Meetings in Washington, DC January 4–7, 2026.

FORMAT: The JMM workshop will include **Special Sessions** showcasing recent work by two of the AWM Research Networks. A **Women in Geometry (WiG)** session will be organized by **Raquel Perales** and **Catherine Searle**, and a **Women in Mathematical Physics (WoMaP)** session will be organized by **Katrina Barron** and **Gaywalee (Gail) Yamskulna**. A juried Poster Session for graduate students, 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 Mathematical Physics or in areas related to Geometry are especially encouraged to apply. Poster presenters will be selected through an application process.

AWM will provide partial travel support to selected graduate students for their participation in the AWM Workshop, thanks to the National Science Foundation. Furthermore, the Diversity Committee of the Mathematical Sciences Institutes sponsors all poster presenters to attend a week-long workshop at one of the participating Mathematical Sciences Institutes.

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 on mathprograms.org and include:

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

Applications must be completed electronically by **August 15, 2025**.
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, 2025**.

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, 2025**.

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

2024–2025 Individual Membership Form

JOIN ONLINE at awm-math.org!

Please fill in this information and return it along with your dues to:
AWM Membership, PO Box 40876, Providence, RI 02940

ASSOCIATION FOR WOMEN IN MATHEMATICS

PO Box 40876
Providence, RI 02940
401.455.4042
http://awm-math.org
awm@awm-math.org

Last Name _____ First Name _____ M.I. _____

Address _____

City _____ State/Province _____

Zip/Postal Code _____ Country _____

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

The AWM Newsletter is published six times a year. If you have questions, contact AWM at **awm@awm-math.org**, 401.455.4042, or visit our website at: **https://awm-math.org.**

E-mail: _____ Home Phone: _____ WorkPhone: _____

PROFESSIONAL INFORMATION:

If student, check one:

☐ Graduate ☐ Undergraduate

If not employed, leave position and institution blank.

Position: _____

Institution/Company: _____

Country: _____

City: _____ State/Province: _____ Zip/Postal Code: _____

DEGREES EARNED:

	Degree(s)	Institution(s)	Year(s)
Doctorate:	_____	_____	_____
Masters:	_____	_____	_____
Bachelors:	_____	_____	_____

INDIVIDUAL DUES SCHEDULE

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

NOTE: All checks must be drawn on U.S. banks and be in U.S. funds.

☐ Regular individual membership *(new members only)* $35
☐ Regular individual membership *(members earning <$90,000)* $70
☐ Regular individual membership *(members earning ≥$90,000)* $100
☐ Family membership, *please indicate family member who is a regular AWM member:* _____ $40
☐ Contributing membership (*members earning <$90,000*)(*includes designation of a free student membership*) $160
☐ Contributing membership (*3 year membership, members earning <$90,000*) $480
☐ Contributing membership (*members earning ≥$90,000*)(*includes designation of a free student membership*) $190
☐ Contributing membership (*3 year membership, members earning ≥$90,000*) $570
☐ Part-time employed $35
☐ AWM-SIAM Reciprocity membership $35
☐ AWM-KWMS Affiliate membership $30
☐ Retired membership $40
☐ Student membership $25
☐ Unemployed membership $20
☐ Gift membership, *please indicate name and email of giftee:* _____ $70
☐ Outreach membership $10
☐ Contribution to the AWM Endowment fund ..... $_____
☐ Contribution to the AWM Annual Giving Campaign ..... $_____
☐ I *do not* want my name to appear in annual lists of contributors to AWM's funds.

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

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

TOTAL ENCLOSED $_____

AWM
PO Box 40876
Providence, RI 02940

NONPROFIT ORG
U.S. POSTAGE PAID
MERRIFIELD, VA
PERMIT NO. 2333

ASSOCIATION FOR
WOMEN IN MATHEMATICS

Printed in the U.S.A.

ASSOCIATION FOR WOMEN IN MATHEMATICS

Volume 55, Number 3, May–June 2025

ADDRESS CORRECTION FORM

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

MAIL TO:

AWM
PO Box 40876
Providence, RI 02940

or E-MAIL:

awm@awm-math.org

Name _____

Address _____

City _____ State _____ Zip _____

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

Position _____ Institution/Org. _____

Telephone: Home _____ Work _____