ASSOCIATION FOR WOMEN IN MATHEMATICS

Newsletter

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

IN THIS ISSUE

PRESIDENT'S REPORT

Greetings, friends and colleagues. As I embark on this new role as president, I'd like to take a moment to reintroduce myself and share a bit of my journey so we can continue to grow together as a community.

After graduating from Xavier University of Louisiana, I pursued my doctorate at the University of Nebraska–Lincoln. There, Christina Eubanks-Turner—now a professor at Loyola Marymount University—and I became the first two African Americans to earn doctorates in mathematics from the university. I currently serve as a Professor and Associate Vice Provost at Texas Tech University, where I have been a faculty member since 2008.

My involvement with the Association for Women in Mathematics began as a recent PhD and continued as a judge for the essay contest and a committee member for two research symposia. In 2021, I joined *La Matematica* as an associate editor. I am deeply grateful to Victoria Howle and Ami Radunskaya for their invitation to serve and for the mentorship I've received from the incredible women of this organization.

Immediate past president Talitha Washington graciously and humorously guided me in understanding the role of president while sharing valuable insights into the practical workings of AWM. I am deeply grateful for her mentorship and encouragement over the past year, often paired with timely reminders to approach challenges with a sense of lightheartedness. During the AWM Reception at JMM 2025, she ceremoniously passed the "silver bowl" of presidency to me. Now, as President, I embrace the responsibilities of this role.

A key AWM event at JMM is the annual in-person Executive Committee Meeting. Unlike our shorter virtual meetings, this extended gathering allows us to delve deeper into programs and policies. During this meeting, the group unanimously approved the Awards Portfolio's proposal to launch a four-year pilot program supporting student chapter innovation grants. With 109 chapters organizing activities, lectures, and meetings for their members, these grants will bolster the chapters' efforts, ensuring they have resources to support their communities and address emerging challenges in an increasingly uncertain landscape. More details about the program will be shared in the coming months.

The AWM events at JMM 2025 inspired us to foster ideas and forge friendships. Women in Groups, Geometry, and Dynamics and Women in Operator Algebras organized the annual workshop. Past President Washington lent her Spanish skills during the EvenQuads Translate-a-Thon. As a decorated researcher in affine algebraic geometry, Neena Gupta of the Theoretical Statistics and Mathematics Unit of the Indian Statistical Institute shared her work during the 44th Emmy Noether Lecture. Amid exchanging expertise, we paused to celebrate as cupcakes marked the birthdays of Washington and Executive Director Darla Kremer on January 9th at the AWM Booth. It was heartwarming to see colleagues and exhibit hall guests stop by to share their good wishes and join in the festivities.

As we welcomed 2025 and prepared to travel to Seattle, the Biden Administration honored fourteen individuals with National Medals of Science. Among them were mathematician Ingrid Daubechies of Duke University and computer scientist and mathematician

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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.

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

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PRESIDENT'S REPORT *continued from page 1*

Cynthia Dwork of Harvard University. Dwork was recognized for her groundbreaking work in developing differential privacy, while Daubechies was celebrated for her pioneering contributions to wavelet theory. We are happy to celebrate them during Women's History Month and this period of attempted dismantling of programs that support our community.

Just as they closed 2024 with well-deserved gratitude and pride, Candice Price of Smith College did the same, receiving the Deborah and Franklin Haimo Award for Distinguished College or University Teaching of Mathematics from the Mathematical Association of America. Known for her research in DNA topology and her advocacy for diversity in STEM, Price is also one of the plenary speakers for the upcoming research symposium.

The 2025 AWM Research Symposium will take place at the University of Wisconsin–Madison this May. A new feature of this meeting is a dedicated day for undergraduate math majors. It is essential that we intentionally engage the next generation of researchers and educators, meeting them where they are and providing the support and guidance they need as they navigate the mathematical sciences. During times such as these, our commitment to inclusivity, support, and advocacy remains.

My journey in mathematics and with AWM has been and continues to be rich with opportunities to connect, create change, and leverage my knowledge while refining my expertise. I am honored to lead and serve this organization as we work together to ensure that all contributions and talents are valued and celebrated.

Raegan Higgins

Raegan Higgins
February 19, 2025
Lubbock, TX

ASSOCIATION FOR WOMEN IN MATHEMATICS

Student Chapter Awards 2025

What projects, events, or programs could your student chapter undertake in this new school year? We love hearing about and featuring these programs, so be sure to complete the end of year survey in May and nominate your chapter.

AWM Newsletter Student Column Editors Introduction

It is with great pleasure that we introduce to the *AWM Newsletter* readers and community our *AWM Newsletter* Student Column Editors! Congratulations Meghan Lee and Nandhini Ravishankar on being selected as the inaugural Editors of our new Student Column.

Meghan Lee

leemh23@wfu.edu, Wake Forest University

Meghan Lee

My name is Meghan Lee, and I am a second-year graduate student in the Master's program in mathematics at Wake Forest University where I am working on a thesis in arithmetic geometry. I am Graduate Student President of Wake Forest's AWM chapter and an undergraduate research project leader, and am passionate about building inclusive and supportive spaces for students in our department. As an undergraduate at Occidental College, I studied mathematics while also exploring my interests in philosophy, literature, and Asian American studies. I also nurtured my love for written and multimedia storytelling—a powerful means of impact—while working for the campus newspaper, *The Occidental*, where I eventually served as Editor-in-Chief. In my free time, I love reading, writing, running, and exploring coffee shops.

Nandhini Ravishankar

Nandhini Ravishankar

nravish2@ncsu.edu, NC State University

I'm Nandhini Ravishankar, a senior at North Carolina State studying Applied Mathematics with minors in Economics and English. I love tackling complex problems and exploring the connections between math, technology, and society. Outside of classes, I've worked on North Carolina State's yearbook, *Agromeck*, and enjoyed mentoring young women in mathematics through events like Sonia Kovalevsky Day. I'm always looking for engaging ways to apply math, and I enjoy collaborating on projects that blend analytical thinking with real-world impact. In my free time, I love reading, writing, and dancing.

The first Student Column will appear in the May–June 2025 *Newsletter*. While the Student Chapter Corner provides *Newsletter* readers a window into the activities of student chapters around the country, the Student Column will provide an additional, regular student voice to the *Newsletter*.

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
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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 everything else, including ads and address changes, to AWM, awm@awm-math.org.

ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM ONLINE

The *AWM Newsletter* is freely available online.

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

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

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

AWM DEADLINES

AWM Travel Grants: May 15, 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

RCCW Proposals: July 1, 2025

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Note from the Editor: I invited readers to send information on unidentified individuals in images to the editor, so they can be added to captions in the digital version.

AWM Workshops at the 2025 Joint Mathematics Meetings

Carolyn Abbott (Brandeis University), Matthew Krauel (California State University, Sacramento), Kelly McKinnie (University of Montana), Kate Petersen (University of Minnesota Duluth), Sarah Reznikoff (Virginia Tech), Rachel Skipper (University of Utah), Denise Rangel Tracy (Francis Marion University), Maria Grazia Viola (Lakehead University)

The 2025 Joint Mathematics Meetings were held January 8–11, 2025 in Seattle. AWM held a series of events in conjunction with JMM including the Workshops, Special sessions, panels, AWM-AMS Noether Lecture, the Reception and Awards Presentation, and more.

The AWM Workshop included the AWM Special Session on Women in Operator Algebras (WOA), the AWM Special Session on Women in Groups, Geometry, and Dynamics (WiGGD), and a mentoring luncheon which took place on January 11th. A Panel and the Graduate Student Poster Session followed by the AWM Reception and Awards Presentation took place on Friday, January 10th. On Friday an AWM panel on the intersection of AI and Women in the mathematical sciences was also held. AWM Workshops are structured to build on previous AWM research programs, thereby reuniting researchers working in a common field so as to continue to strengthen the collaboration network.

The WOA special session focused on recent advances in the field, interesting open questions, and new connections to explore in the theory of operator algebras. C*-algebras and von Neumann algebras were equally represented in the research projects presented on Saturday. Topics included rigidity results for group von Neumann algebras, the

uniform super McDuff property for factors, the ideal intersection property for partial reduced crossed products, simplicity of C*-algebras of non-Hausdorff groupoids, the local bisection hypothesis for twists over étale groupoids and quasi-Cartan pairs, textile systems, and the investigation of their associated 2-graph C*-algebras.

Furthermore, several talks dealt with the quantum setting which has been a major area of research in recent years, such as limits of quantum graphs, quantum metrics on compact quantum groups, and Cuntz-Pimsner algebras of quantum graphs.

This special session was organized by Sarah Reznikoff (Virginia Tech) and Maria Grazia Viola (Lakehead University), and followed the Banff International Research Station workshops "Women in Operator Algebras II" and "Women in Operator Algebras III" that were held in 2021 and 2023, respectively.

Twelve mathematicians presented their results: **Jennifer Zhu** (University of Waterloo), **Menevse Eryuzlu** (University of Colorado, Boulder), **Therese-Marie Basa Landry** (University of California, Santa Barbara), **Lara M. Ismert** (Embry-Riddle Aeronautical University), **Samantha Brooker** (Virginia Tech), **Priyanga Ganesan** (University of California, San Diego), **Jennifer Sarah Pi** (University of Oxford), **Carla Emilia Farsi** (University of Colorado), **Larissa Kroell** (University of Waterloo), **Kathryn McCormick** (California State University, Long Beach), **Adriana Fernandez I. Quero** (University of Iowa), **Hui Tan** (University of California, Los Angeles).

The WiGGD special session focused on recent advances in groups, geometry, and dynamics. Topics included Artin groups, manifolds and branched covers of manifolds, Frattini subgroups, minimal volume entropy, rigidity of surfaces and surface amalgams, residual properties of groups, and the emerging theory of geometric group theory for topological groups. The session was organized by **Carolyn Abbott** (Brandeis University) and **Rachel Skipper** (University of Utah), and followed the workshop **"Women in Groups, Geometry, and Dynamics"** that was held in Ashton, Idaho, in July 2023.

Ten women mathematicians presented their results: **Jill Mastrocola** from Boston College, **MurphyKate Montee** (Carleton College), **Arianna Zikos** (Wesleyan University), **Gil Goffer** (University of California, San Diego), **Hyeran Cho** (Ohio State University), **Yandi Wu** (Rice University), **Elizabeth Field** (University of Washington, Bothell), **Milana Golich** (Purdue University), **Rebecca Rechkin** (University of Utah), and **Beth Branman** (University of Virginia).

The AWM Graduate Poster Session is a judged session, and this year all participating graduate students were offered an opportunity to further anchor themselves in their research fields, with a prize like no other: an invitation to participate in a week-long workshop at one of the research institutes. These prizes are made possible in coordination with the NSF Mathematical Sciences Institutes Diversity Committee, co-chaired by **Selenne Bañuelos** and **Ulrica Wilson**.

Graduate student posters may be in any areas of mathematics, but often involve the theme of the special session. The latter fosters networking among participants and further mentoring from women leaders in the field. The Friday night Graduate Poster Session was organized by Abbott, **Matthew Krauel** (California State University, Sacramento), Reznikoff, Skipper, Viola, and **Denise Rangel Tracy** (Francis Marion University) who, in addition, coordinated the judging. Presenting this year was quite an accomplishment as there were many submissions to participate and only 20 submissions were ultimately selected. The poster session was open to the public and attracted a large, and entertained, crowd. Judges were able to view the posters, speak with presenters, provide feedback, and decide on the top posters.

The poster presenters were: **Tatyana Benko**, **Samara Chamoun**, **Ann Clifton, Halley Fritze**, **Allison Fuller**, **Jennifer Guerrero**, **Sanaz Hami Hassan Kiyadeh**, **Evgeniya Lagoda**, **Ruma Maity**, **Lillian Makhoul**, **Nitya Mani**, **Marcella Manivel**, **Sofia Martinez Alberga**, **Jodi McWhirter**, **Mackenzi Mehlberg**, **Molly Noel**, **Samantha Sandberg**, **Kimberly Savinon**, and **Wanchen Zhao**.

This year's top two posters were create by, in alphabetical order, **Nitya Mani** and **Wanchen Zhao**. Honorable mention went to **Marcella Manivel**. All three received prize certificates.

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Overall, participation in the poster session was an excellent opportunity for the graduate students to showcase their work, practice presentation skills, and to be welcomed into the research community.

A special thanks to the volunteer judges, **Basca Jadamba**, **Carla Farsi**, **Fnu Nisha**, **Gil Goffer**, **Hyeran Cho**, **Jennifer Pi**, **Jennifer Schultens**, **Jina Kim**, **Josephine Kagunda**, **Lale Asik**, **Maria Wesslen**, **Mei Yin**, **Nsoki Mavinga**, and **Sara Clifton**, who invested their expertise and time to review the poster presentations and offer pointed and helpful feedback to the students.

This was followed the next day by a mentoring luncheon in which poster presenters met with mentors and discussed a variety of topics. This year, to help identify discussion themes, presenters were surveyed in advance and asked about what was most important to them to discuss with the mentors. From this, each table at the lunch received a theme and sample questions to jumpstart the conversation. Initial table topics were the job search, expanding research interests, and work-life balance/how to network. All the tables were full and discussions were plentiful and wide-ranging. Both current and future AWM presidents were in attendance as were some of the poster judges and workshop participants. A deep thanks to the mentors **Carla Farsi** (University of Colorado Boulder), **Amanda Harsy** (Lewis University), **Kristin Lauter** (Meta), **Theresa Martines** (University of Texas Austin), **Kathryn McCormick** (California State University Long Beach) and **Maggie Miller** (University of Texas Austin). AWM is grateful to **Elsevier** for their sponsorship of the luncheon.

A robust conversation occurred at **The Intersection of AI and Women in the Mathematical Sciences** panel held Friday and organized by **Kelly McKinnie** and **Kate Petersen**. **Maria Klawe** (President of Math for America), **Talithia Williams** (Harvey Mudd College), **Lila Ghemri** (Texas Southern University) and **Kristin E. Lauter** (Meta AI) served as panelists. Panelists discussed recent AI developments and how they will particularly affect women, including bias in algorithms and AI advancements in education. AI governance and accountability were discussed as well as why guardrails are needed to protect users from AI algorithms that have an increased effect on daily life. A big takeaway from the panel was the importance of women and traditionally underrepresented groups to have a seat at the AI table, especially at those leading companies and universities that are developing both the algorithms of AI and the guardrails to try to maximize the benefits while reducing the potential harms.

In this article, we highlighted several ways to get involved with AWM: Research Collaborative Conference Workshops, and Research Networks, poster sessions, judging, and mentoring. If you are interested in learning more about any of these, please email awm@awm-math.org.

In 2026, the JMM workshop will include Special Sessions showcasing recent work by AWM Research Networks **Women in Mathematical Physics** and **Women in Geometry**. 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 applications are due August 15!

The 2025 AWM workshop was made possible by funding from the **National Science Foundation (NSF)** through the Division of Mathematical Sciences grants "Mathematical Connectivity through Research and Equity for Women" (NSF-DMS 2113506). A special thanks to **Elsevier Publishing** for sponsoring the Mentoring Luncheon.

AWM Workshops at the 2025 Joint Mathematics Meetings

Connecting the Community at JMM 2025

Darla Kremer, AWM Executive Director

The 2025 Joint Mathematics Meetings took place in Seattle from January 8 through January 11, 2025. This year, the JMM theme was *We Decide Our Future: Mathematics in the Age of AI* and included more than 60 sessions on the topic of Artificial Intelligence, including the AWM Workshop Panel: ***The Intersection of AI and Women+ in the Mathematical Sciences***, organized by **Kelly McKinnie**, University of Montana, and **Kate Petersen**, University of Minnesota Duluth, and featuring panelists **Maria Klawe**, President of Math for America, **Talithia Williams**, Harvey Mudd College, **Lila Ghemri**, Texas Southern University, and **Kristin E. Lauter**, Meta AI.

The ***Awards Celebration*** began at 4:45 on Wednesday and was preceded this year by the Ribbon Cutting Ceremony. AWM honored prize winners **Mona Merling**, University of Pennsylvania (The AWM Joan and Joseph Birman Research Prize in Topology and Geometry); **Chad Topaz**, Williams College & the Institute for the Quantitative Study of Inclusion, Diversity, and Equity (The Mary and Alfie Gray Award for Social Justice); **Pamela E. Harris**, University of Wisconsin-Milwaukee (Louise Hay Award for Contributions to Mathematics Education); **Dewey Taylor**, University of Texas Rio Grande Valley (M. Gweneth Humphreys Award for Mentorship of Undergraduate Women in Mathematics). The AWM dissertation prizes were awarded to **Yvonne Alama Bronsard**, l'IRMAR, **Agustina Czenky**, University of Southern California, and **Naomi Sweeting**, Princeton University; and the Alice T. Schafer Prizes were awarded to **tahda queer**, City University of New York; **Marie-Hélène Tomé**, Duke University; and **Katherine Tung**, Harvard University.

The prize session was followed by the Grand Opening Reception in the JMM Exhibit Hall. AWM volunteers and staff were on hand to demonstrate the game of EvenQuads, sell cards and T-shirts, give out AWM Student Chapter buttons and other swag, and answer questions about the AWM journal *La Matematica*. As in the past, AWM sponsored a booth for the EDGE and Smith Postbac Programs. A big thank you to **Shalmali Bandyopadhyay**, **Zhanar Berikkyzy**, **Sarah Covey**, **Johanna Franklin**, **Susanna Fishel**, **Raegan Higgins**, **Lakeshia Legette-Jones**, **Kuei-Nuan Lin**, **tahda queer**, **Lauren Rose**, **Michelle Snider**, **Michelle Wagner**, **Talitha Washington**, and others who volunteered at or visited the AWM booth, organized an AWM Session, or participated in an AWM session as a speaker or attendee. It's the community that makes it all worthwhile.

The 2025 AWM-AMS Emmy Noether Lecture, *The Abhyankar-Sathaye Conjecture for Linear Hyperplanes* was delivered on Thursday, January 9, by Professor **Neena Gupta**, Indian Statistical Institute. In this talk, Professor Gupta presented certain new families of linear hyperplanes in which the Abhyankar-Sathaye Conjecture (that any embedding of the affine *n-1* space in affine *n-*

space is rectifiable for any integer $n \geq 3$) holds. In conjunction with the Noether Lecture, The ***AMS-AWM Special Session on Affine Algebraic Geometry and G_a Actions*** was organized by **Gupta** and **Gene Freudenburg**, Western Michigan University.

The AWM Workshop organized by the AWM JMM committee expanded this year to include special sessions by two AWM Research Networks, Women in Groups, Geometry, and Dynamics (WiGGD) and Women in Operator Algebras (WOA), a panel, a poster session, and a mentoring luncheon (these activities are described elsewhere in this issue). The AWM also sponsored the following sessions that make a significant effort to promote women in mathematics or to encourage diverse participation: ***Women in Mathematical Biology***, organized by **Hwayeon Ryu**, Elon University, **Christina Edholm**, Scripps College, **Lihong Zhao**, Virginia Tech, **Robyn Shuttleworth**, Altos Labs, and **Karin Leiderman**, University of North Carolina at Chapel Hill; ***AWM Purdue Chapter: Over a Decade of Empowering Women in Math***, organized by **Sofia Rose Martinez Alberga**, Purdue University, **Daniel Tolosa**, Purdue University, **Asini Anuradhika Konpola**, Purdue University, and **Yiran Wang**, Purdue University; ***Exploring Mathematics through the Arts and Pedagogy in Creative Settings***, organized by **Shanna Dobson**, University of California, Riverside, and **Claudia Maria Schmidt**, California State University. **Oscar Vega**, California State University, **Fresno Xavier Ramos Olive**, Smith College, and **Monica D. Morales-Hernandez**, Adelphi University organized the ***EvenQuads Translate-a-Thon*** workshop with the purpose of translating the EvenQuads Biographies into Spanish.

The AWM Reception took place on Friday evening after the poster session. AWM President **Talitha Washington** introduced **Josephine Wairimu Kagunda**, President of the African Women in Mathematics Association, and incoming AWM President, **Raegan Higgins**. Washington gave the attendees an opportunity to get to know one another by playing "two truths and a lie," before returning to the stage to announce our prize winners.

This year's top two posters, in alphabetical order, were **Nitya Mani** and **Wanchen Zhao**. Honorable mention went to Marcella Manivel. All three received a certificate for this accomplishment.

The *La Matematica* Chief Editors recognized four editors for their exemplary work on the Editorial board: **Alina Bucur**, **Maria Del Mar Gonzales**, **Jo Harding**, and **Alicia Prieto Langarica**.

The 2025 Class of AWM Fellows was also introduced at this reception: **Katrina Barron**, University of Notre Dame; **Marianne Korten**, Kansas State University; **Kathryn Leonard**, Occidental College; **Fengyan Li**, Rensselaer Polytechnic Institute; **Guozhen Lu**, University of Connecticut; **Lillian B. Pierce**, Duke University; **Magdalena Daniela Toda**, Texas Tech University.

The 2025 AWM Service Awards were presented to **Kuei-Nuan Lin**, Associate Professor of Mathematics at Penn State Greater Allegheny, who was recognized for her leadership of the AWM Mentor Network program, for her service on the Education and Outreach Portfolio Committee and on the AWM-NSF

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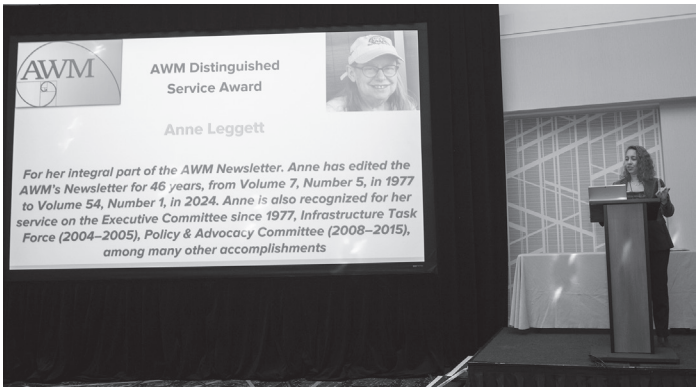
CONNECTING THE COMMUNITY AT JMM 2025 *continued from page 9*

Travel Grants Selection Committee, and for her work as an Associate Editor for the 2022 AWM Symposium Proceedings volume; and **Mei Yin**, Professor of Mathematics, University of Denver, who is recognized for founding and leading the AWM Student Chapter at the University of Denver, and for supporting the AWM Women in Algebraic Combinatorics (WiAC) Research Network. Finally, **Anne Leggett**, Professor Emerita at Loyola University Chicago was honored with the AWM Distinguished Service Award for, among other things, her 46 years of service as *AWM Newsletter* Editor. The Distinguished Service Award is given occasionally in recognition of an individual who has promoted and supported women in mathematics through exceptional and sustained volunteer service to the AWM. The program ended with a ceremonial passing of the AWM Bowl from President **Talitha Washington** to President Elect **Raegan Higgins**.


AWM
AWM Distinguished
Service Award
Anne Leggett
For her integral part of the AWM Newsletter. Anne has edited the AWM's Newsletter for 46 years, from Volume 7, Number 5, in 1977 to Volume 54, Number 1, in 2024. Anne is also recognized for her service on the Executive Committee since 1977, Infrastructure Task Force (2004–2005), Policy & Advocacy Committee (2008–2015), among many other accomplishments

BOOK REVIEW

Einstein's Tutor: The Story of Emmy Noether and the Invention of Modern Physics
by Lee Phillips
Public Affairs, 2024
ISBN 978-1541702950

Reviewer: Cynthia Huffman, Pittsburg State University, cjhuffman@pittstate.edu

Quoting a line from the animated TV series *Avatar: The Last Airbender,* "History is not always kind to its subjects." This seems to be particularly true of several women scientists in previous centuries. Even if they were well-known in their own time, credit for their contributions seems to have faded as the years progressed. Examples of women to whom history was not always kind include Rosalind Franklin who was not originally recognized for her work that led to the discovery of the double-helix nature of DNA, Émilie du Châtelet who merged ideas of Newton and Leibniz in helping spread knowledge of calculus, and Emmy Noether whose important Noether's Theorem not only provided a foundation for Einstein's theory of general relativity but also was used in the development of the standard model of particle physics. Recently, efforts have been undertaken to increase the awareness of the overlooked contributions of women scientists. In his book *Einstein's Tutor*, physicist and author Lee Phillips does a wonderful job of presenting for a general audience the work of Emmy Noether, who "invented modern physics" (p. 220).

For this algebraist who teaches and researches in the history of mathematics and has never taken a course in physics, it was enlightening to read a biography of Emmy Noether from the physics perspective. Everything I had read up to this point about Dr. Noether focused on her contributions to mathematics, especially her role as the "Mother of Abstract Algebra." Dr. Phillips adeptly explains the complex concepts from both physics and mathematics. He provides examples and analogies to make the material understandable, especially to those like myself with no experience in physics and to those with no background in abstract algebra.

According to the author, "This book is mainly the story of an idea called Noether's Theorem and the trajectory of its fortunes from its creation around 1918 up to the present day" (p. 245). The first chapter provides interesting background information on the setting and the people involved. Chapters 2 and 7 are more technical, discussing gravity and the standard model, respectively, with even more technical details provided in the appendix for the interested reader. A reader not interested in technicalities can skim these parts. Chapter 3 is an intuitive look at Noether's Theorem (actually four theorems) in physics, tying together the concepts of symmetry and conservation laws. Chapters 4 through 6 provide a well-researched captivating biography of Emmy Noether, including a look at barriers, such as being both female and Jewish in Nazi Germany, that she overcame. The book concludes with Chapter 8, which is "chiefly about how [Noether's Theorem] continues to inspire research and find new applications" (p. 245).

We tend to forget that famous personages like Einstein were real-life people, who lived daily lives, interacting with and being influenced by other people. A masterful storyteller, Dr. Phillips weaves a page-turning tale of how just the right group of people (including Einstein, Hilbert, and Noether) were at the right place (the University of Göttingen in Germany) at the right time (the early 20th century) to lead to the development of Einstein's general theory of relativity. After reading the book, I felt that I actually knew Professor Noether. With recent successful movies about geniuses such as Ramanujan (*The Man Who Knew Infinity*, 2015), *Hypatia* (Agora, 2009), Alan Turing (*Imitation Game*, 2014), and John Nash (*A Beautiful Mind*, 2001), this book would be a great basis for a movie about Emmy Noether. I highly recommend *Einstein's Tutor*. In a world still striving for equality, this engaging narrative serves as a powerful reminder of the resilience and brilliance that can emerge when one dares to defy the odds.

The Bearded Lady Project: Challenging the Face of Science
Lexi Jamieson Marsh, and Ellen Currano, editors
Columbia University Press, 2020
ISBN 978-0231198042

Reviewer: Marge Bayer, bayer@ku.edu

The Bearded Lady Project is a documentary film and photographic project celebrating the work of female paleontologists and highlighting the challenges and obstacles they face" (https://thebeardedladyproject.com/). The book describes the project, with essays by Lexi Jamieson Marsh (filmmaker), Ellen Currano (paleobotanist), and Kelsey Vance (one of the photographers). It also includes essays by many of the paleontologists who were in the film and photographs, as well as articles by a social psychologist and by two historians about gender in science. And, best of all, it includes over 50 photographs of the scientists, in most cases with (fake) beards. (Many photos can also be found at the web page of the project.)

Beards? Marsh says that the project "started as a wry joke." It comes from looking at images of paleontologists (all male) in textbooks, observing that beards symbolize how long they stay in the field immersed in science, and represent the freedom to travel for long periods, free from caregiving responsibilities. If only the female field researchers had beards, they would be recognized for their commitment and accomplishments. But "the bearded lady" also refers to performers in nineteenth century circuses and sideshows, seen as amusing challenges to gender norms.

I do not suppose that wearing beards have helped women in mathematics in their careers. But we can all think of male markers for mathematicians.

The book is divided into three parts. The first, "Why Challenge the Face of Science," starts with some background on issues of gender in science. Did you know that the word "stereotype" (with this meaning) was coined by journalist Walter Lippman in 1922? Also, Ellen Currano gives an introduction to paleontology.

We all know of examples of studies showing how resumes or reference letters are interpreted differently if the reader believes that the subject is a man or woman. An example given here concerns course evaluations. Four sections of an online course were offered. Two were taught by a woman, and two by a man. However, in one of the woman's sections, the students were told the instructor was a man, and vice versa for one of the man's sections. Guess what! When the students thought their instructor was female, even when he was male, they rated the instructor lower.[1]

Part II, "Women in Paleontology," has 12 essays by working paleontologists, about their experiences as women in the career. They talked about support they received, but gave plenty of stories of obstacles. Probably the most outrageous was from Patricia Kelly, about having children before the Family and Medical Leave Act: "I told my department chair in March that I was expecting a baby in August. He responded by suggesting I postpone the birth until October, when it would be more convenient for a colleague to take over my classes" [p. 102].

Part III, "Behind the Lens," is about the making of the film. Unfortunately, I didn't find a way to watch the documentary film online.

The project did get some criticism for presenting the gender issue from a binary perspective. The book addresses this in a couple of ways. The authors acknowledge that the following goal applies not just to cis females: "*The Bearded Lady Project* makes visible, through explicit gender play, the ways women must negotiate gender performativity in the sciences, specifically in the field of paleontology" [p. 130]. One of the participants, Sara Pruss of Smith College, declined to wear a fake beard, a decision that she said was influenced by the understanding she developed through experiences with her nonbinary students.

I learned some things from an interview with Lexi Jamieson Marsh and Ellen Currano which appeared on the Mini Geology YouTube Channel[2]. The project received some funding from Ellen Currano's NSF Career Grant.

When they decided to write the book, they expected to self-publish it. Then, an editor Currano knew at Cambridge University Press learned of their endeavor, and agreed to take it on. I am happy they did.

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[1] Lillian MacNell, Adam Driscoll, and Andrea N. Hunt, "What's in a Name: Exposing Gender Bias in Student Ratings of Teaching," Innovative Higher Education 40, no. 4 (2015): 291–303.

[2] The interview was conducted by Daniel Minisini and can be found at https://www.youtube.com/watch?v=MAH8PVdzDdM.

MEDIA COLUMN

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

Betty's Bad Luck in Love Actuary

By Sarah J. Greenwald, Appalachian State University

Betty's Bad Luck in Love is a romantic-comedy movie that aired as part of the Hallmark brand in 2024. Hallmark focuses on family-oriented entertainment that is known for having a target audience of women. Hallmark movies can be found on Hallmark cable TV channels as well as through several different streaming providers.

In this movie, the lead character is a risk analyst and actuary. I watched the film because of this. I was interested in any messages related to being a woman in the actuarial field as well as how actuarial professions and statistics are represented overall. In this context, the themes are worth a watch, if they interest you like they did me. However, the movie has a silly premise about cursed romance that does not do it any favors, in my view.

I liked that Betty's professional reputation is shown so positively. Betty has a large office while others are in cubicles. After presenting her preliminary analysis, her boss praises her "excellent work" to the rest of the team. In addition, as they are walking out he says "well done, Betty." Then, Nelson, a colleague, compliments her "stupendous report." Betty acknowledges the contributions of Nelson's accounting team. Moreover, Nelson tells Betty, "I always say to everyone in risk management and actuarial science. If you want to learn from the best, talk to Betty Baldwin. She'll have you covered from head to toe." Later, Nelson praises Betty's risk report again as "Pure poetry. The way that you've incorporated that third-party data is brilliant." However, I feel that the impact of Nelson's comments is diminished because Nelson wants to go out with Betty and so the motivation for them is rendered somewhat suspect as a result.

While Nelson is written and portrayed as an awkward nerd, Betty is not a nerd and yet she is also assigned negative personality traits. Betty semi-regularly states the tiny probability of certain events. This alone could have been fine as I like that this showcases the role of chance and probability in everyday life and the people interacting with Betty accept this about her. I wish that the movie had gone beyond these probability assertions and used them to demonstrate how we can manage uncertainty as well as our fears. Instead, the writers choose what I think is a bizarre direction for a risk analyst when they make Betty's character almost completely risk-averse. I found this plot point disappointing and tiresome. The risk aversion is taken to an extreme level. It is related to Betty's attempts at controlling certain situations, including stalking behavior. It is not only me who found the behavior problematic. Several people in the movie comment on it negatively and some are

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**.

upset with Betty because her actions not only impact herself but others too. At times they call out Betty for her behavior and at other times they criticize it within conversations about her.

The show briefly incorporates the mention of statistical topics at the firm where Betty works and as part of the risk aversion scenes. These include risk calculations, projections and bar chart visualizations. One small quibble is that sometimes characters talked about the odds of something occurring when they meant the probability.

Actuarial professions come off reasonably well in this movie. The firm is listed as a "global enterprise" and I like that it has women, men and people of diverse ethnicities and races working there. In real life, actuaries are generally very well paid. While this is never explicitly stated in the movie, the portrayals are consistent, which I feel shines a positive light on actuarial professions. For example, Betty offers to help a friend in financial need and doesn't want the money returned. Betty's apartment, clothing and lifestyle also reflect financial comfort. Another positive aspect of being an actuary in the movie is a good work-life balance. In popular culture, mathematically talented people are sometimes portrayed with minimal outside interests. That is still true for Nelson in this movie, but Betty has a life outside of work. She dates and has a best friend. She is widely read, likes galleries and museums and participates in exercise classes. However, like so many other portrayals of mathematical people in popular culture, the messaging comes with negativity, the extreme risk aversion in this case.

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**.

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/.

Photo by Ben Walker, University of Tennessee

Olivia Prosper Feldman Named 2025 AWM-MAA Etta Zuber Falconer Lecturer

In recognition of her distinguished contributions to mathematical epidemiology, her innovative approaches to mentoring and broadening participation in mathematics, as well as her skill in delivering expository lectures, the Association for Women in Mathematics and the Mathematical Association of America are pleased to announce the 2025 Etta Z. Falconer Lecturer will be **Olivia (Prosper) Feldman**, Associate Professor, University of Tennessee. Feldman earned her BS, MS, and PhD in mathematics from the University of Florida. Following a postdoc at Dartmouth College and assistant professor at the University of Kentucky, Feldman moved to the University of Tennessee at Knoxville where she is currently an associate professor in the Department of Mathematics. Feldman's work has been recognized locally at her institution through a Professional Promise in Research and Creative Achievement Award in 2024. Nationally, she has received a CAREER award and Collaborative Research grants from the National Science Foundation as well as an Intercollegiate Biomathematics Alliance Excellence in Research Award.

Citation: Feldman is an extraordinary researcher. She is an expert in mathematical modeling and has considered topics such as parasite-borne infection and population dynamics, with many of her projects being related to interventions and strategies for controlling outbreaks and understanding societal and economic impacts of emerging diseases. Additionally, Feldman develops methods for improved selection of model parameters and model-based-design of experimental data collection. In the span of 2020 to 2024, she published 14 peer-reviewed articles and wrote three preprints. Several of these works resulted from the American Institute of Mathematics Structured Quartet research ensemble (AIM SQuaRE). Feldman's ability to collaborate, and in particular her ability to bring people together for research, is notable. In 2021, Feldman was an organizer for an American Mathematical Society Mathematical Research Community which brings advanced graduate students, postdocs, and early career faculty together to work on projects in the research areas of the organizers.

Biographical Sketch: In addition to her impact on research, Feldman is an excellent teacher and mentor. She received the Ann Keith Rea Faculty Teaching Award at Tennessee in 2021, has mentored 4 PhD students, 1 Master's student, and many undergraduates. An example of her impact on the student's trajectories, Feldman has started the Junior Modelers Program (JuMP) at Tennessee where undergraduates are introduced to data driven modeling and coding as early as their first semester of college. Known for her ability to convey complex ideas in a relatable manner, Feldman has been interviewed by the *New York Times* for her expertise in epidemiology and has served on webinar panels to discuss the impact of Covid-19 on the Black community. Feldman has a stellar track record of excellence in mathematics research, teaching, and outreach and we are pleased to select her as the distinguished 2025 Etta Z. Falconer Lecturer.

Response from Feldman: It is an honor to be recognized by AWM and MAA as the 2025 Falconer lecturer. AWM has played an important role in my career, providing support and opportunities to expand my collaborations and to provide opportunities for my graduate students.

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

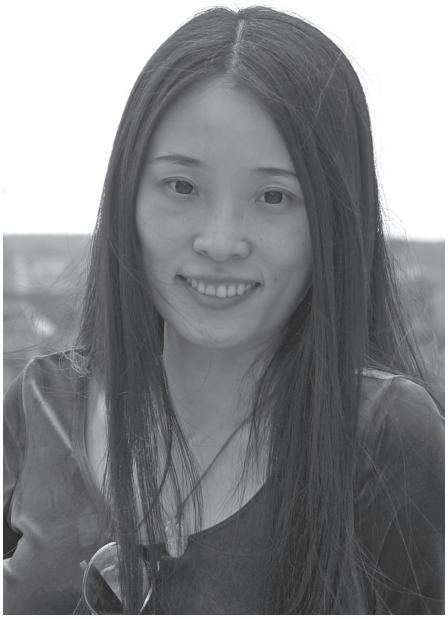
Yongjie Jessica Zhang Named AWM-SIAM Sonia Kovalevsky Lecturer

The Association for Women in Mathematics (AWM) and the Society for Industrial and Applied Mathematics (SIAM) announce that **Yongjie Jessica Zhang** has been selected as the 2025 Sonia Kovalevsky Lecturer. Her lecture will be delivered at the 2025 SIAM/CAIMS Annual Meeting taking place in Montréal, Québec, Canada, July 28–August 1, 2025.

Citation: Dr. Yongjie Jessica Zhang is a distinguished scholar renowned for her pioneering work in computational geometry and finite element methods, with profound impacts across biomedical and engineering applications. As a professor at Carnegie Mellon University, she has advanced meshing techniques that enable precise simulations in complex domains that appear in medical imaging and biological modeling. Dr. Zhang's innovative research on isogeometric analysis has set new standards in numerical accuracy and computational efficiency. Her numerous publications, leadership roles, and accolades, including her status as a fellow of several scientific societies, underscore her dedication to advancing the field and inspiring the next generation of computational scientists.

Biographical Sketch: Jessica Zhang is the George Tallman Ladd and Florence Barrett Ladd Professor of Mechanical Engineering at Carnegie Mellon University (CMU) with a courtesy appointment in Biomedical Engineering. She received her BEng in Automotive Engineering, and MEng in Engineering Mechanics from Tsinghua University, China; and MEng in Aerospace Engineering and Engineering Mechanics and PhD in Computational Engineering and Sciences from Institute for Computational Engineering and Sciences (now Oden Institute), The University of Texas at Austin. Her research interests include computational geometry, isogeometric analysis, finite element method, data-driven simulation, image processing, and their applications in computational biomedicine and engineering. Zhang has co-authored over 240 publications in peer-reviewed journals and conference proceedings and received several Best Paper Awards. She published a book entitled *Geometric Modeling and Mesh Generation from Scanned Image*s with CRC Press, Taylor & Francis Group. Zhang is the recipient of a Simons Visiting Professorship from Mathematisches Forschungsinstitut Ober-wolfach of Germany, US Presidential Early Career Award for Scientists and Engineers, NSF CAREER Award, Office of Naval Research Young Investigator Award, and USACM Gallagher Young Investigator Award. At CMU, she received David P. Casasent Outstanding Research Award, George Tallman Ladd and Florence Barrett Ladd Professorship, Clarence H. Adamson Career Faculty Fellow in Mechanical Engineering, Donald L. & Rhonda Struminger Faculty Fellow, and George Tallman Ladd Research Award. She is a Fellow of SIAM, ASME, IACM, USACM, IAMBE, AIMBE, SMA, and ELATES at Drexel. She is the Editor-in-Chief of *Engineering with Computers*.

The Kovalevsky Lecture honors Sonia Kovalevsky (1850–1891), the most widely known Russian mathematician of the late 19th century. In 1874, Kovalevsky received her Doctor of Philosophy degree from the University of Göttingen and was appointed lecturer at the University of Stockholm in 1883. Kovalevsky did her most important work in the theory of differential equations.



Ling Xiao Wins Ruth I. Michler Memorial Prize

The Association for Women in Mathematics and Cornell University are pleased to announce that **Ling Xiao** (University of Connecticut) has been awarded the 2025–2026 Ruth I. Michler Memorial Prize.

Citation: Ling Xiao is the recipient of the 2025–2026 Ruth I. Michler Prize for her research accomplishments in geometric analysis and partial differential equations.

Ling Xiao works on the analysis of geometric flows, such as mean curvature flow, and associated nonlinear partial differential equations. She has made significant contributions to the study of curvature flows in Euclidean space and in Minkowski space, and to the asymptotic Plateau problem for constant-curvature hypersurfaces in hyperbolic space.

In the time she will spend at Cornell, Xiao plans to interact with faculty in analysis and geometry, in particular Xiadong Cao and Xin Zhou.

Xiao received her PhD from Johns Hopkins University in 2013. She was then a postdoctoral researcher at SLMath Institute (formerly MSRI), a Visiting Assistant Professor at Cornell University, and a Hill Assistant Professor at Rutgers University, before moving to the University of Connecticut as a tenure-track Assistant Professor in 2017. She was promoted to Associate Professor in 2023. In 2024 she is a Research Member at SLMath Institute.

Response from Xiao: It is a great honor to be the recipient of the 2025–2026 Ruth I. Michler Memorial Prize. I am very grateful for the committee's recognition of my work in Geometric Analysis and PDE.

I also want to thank the Michler family, the AWM, and the Cornell Mathematics Department for the opportunity to spend one semester at Cornell to focus on research.

Finally, I would like to thank my mentors and colleagues for their constant help, support, and encouragement through all these years.

The Ruth I. Michler Memorial Prize was established through a generous donation from Ruth's parents Gerhard and Waltraud Michler of Essen, Germany. The award grants a mid-career mathematician a residential fellowship in the Cornell University Mathematics Department without teaching obligations. The Michlers established the memorial prize with the Association for Women in Mathematics to honor Ruth's commitment to the AWM mission of supporting women mathematicians. Cornell University was chosen as the host institution because of its distinctive research atmosphere and because Ithaca was Ruth's birthplace.

Monica Vişan Named 2026 AWM-AMS Emmy Noether Lecturer

Photo by Penny Jennings

The Association for Women in Mathematics (AWM) and the American Mathematical Society (AMS) announce that **Monica Vişan** has been selected to deliver the 45th Emmy Noether Lecture at the Joint Mathematics Meetings to be held in Washington, DC on January 4–7, 2026.

Citation: Monica Vişan is a Professor of Mathematics at the University of California, Los Angeles (UCLA), where she has been an academic member since 2009. She earned her PhD from UCLA in 2006, studying under Terence Tao. After two years as a member of the Institute for Advanced Study (2006–2008), she served as an Assistant Professor at the University of Chicago (2008–2009) and was a Harrington Fellow at the University of Texas, Austin (2010–2011).

Vişan is a leading figure in the field of nonlinear dispersive equations, having made significant contributions to the well-posedness theory of critical dispersive equations, thestudy of dispersive equations on domains with boundaries, and the construction of invariant measures for several key models. In collaboration with Rowan Killip, she introduced the method of commuting flows (*Annals of Math*. (2) 190 (2019)), which has led to important breakthroughs in the analysis of integrable dispersive models, including the Korteweg-de Vries equation.

Citation: An active member of the mathematical community, Vişan has organized eleven conferences throughout her career, including two Special Sessions at AMS meetings, three Oberwolfach meetings, and a workshop at ICERM. To date, eight students have completed their doctorates under her supervision. She currently serves as an editor for the *Memoirs and Transactions of the American Mathematical Society*, as well as the *Proceedings of the London Mathematical Society*.

Vişan's work has garnered her numerous accolades, including a Clay Liftoff Fellowship in 2006, a Sloan Fellowship in 2010, a Kavli Fellowship in 2010, and a Frontiers of Science Award at the International Congress of Basic Science in 2023. She is also recognized as an exceptional educator, having received UCLA's Sorgenfrey Distinguished Teaching Award in 2018. Additionally, she has delivered numerous lecture series across the globe, including in China, Japan, and Switzerland.

AWM established the Emmy Noether Lectures in 1980 to honor women who have made fundamental and sustained contributions to the mathematical sciences.The lecture honors Emmy Noether (1882–1935), one of the great mathematicians of her time. She worked and struggled for what she loved and believed in. Her life and work remain a tremendous inspiration.

EDUCATION COLUMN

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

Let's Teach Them What They Need to Know

Jo Hardin, Professor of Mathematics and Statistics, Pomona College, Jo.Hardin@pomona.edu.

I don't know the full history or choices along the way that built the 20th- and 21st-century math curriculum in California public schools, or anywhere else, for that matter. But I do know that the space race in the 1950s and 60s and the related Cold War throughout the second half of the 20th century drew the best and the brightest of our students into physics (Hilborn and Howes 2003, fig. 1; Lövheim 2021). In terms of mathematics, calculus is fundamental to understanding physics and working in any of the related fields, including astronomy and engineering. So, it doesn't surprise me that our public-school mathematics curriculum builds directly toward having the top students complete a two-course sequence of Calculus I and Calculus II by the time they graduate from high school. But there is a case to be made that our national interests have changed, and I believe that we do a disservice to our high school students when they graduate without having engaged with statistics, modeling, or really any data analysis at all.

Below I detail some of the ongoing debates happening in the state of California. I also describe one of our newest threats to poverty and income inequality: online sports gambling. And while I wholeheartedly agree that we need to continue to offer some of our students calculus (we still need physicists, after all!), I would like to see the structure of the curriculum flipped to focus most students on data acumen skills and only some students on calculus skills.

The California debates

For admission to the University of California (UC) system,[1] three years of college-preparatory mathematics that include the topics covered in elementary and advanced algebra and two- and three-dimensional geometry are required; a fourth year of math is strongly recommended. The course sequence Algebra I, Geometry, and Algebra II is the typical way, in California, to fulfill the requirement.

In 2020, the UC Board of Admissions and Relations with Schools (BOARS) for the University of California system (including UC Berkeley and UCLA) officially confirmed long-standing practice that the Algebra II requirement could be validated[2] by students who had taken Statistics (BOARS 2020). The BOARS 2020 decision was framed as being an "equity issue," where they state, "By clarifying the definition of college math readiness and expanding the choices of area C math courses students can take to be eligible for UC admissions, students should be encouraged to pursue the mathematics education most relevant to their academic and career goals."[3] However, equity seems to be undermined by the following statement: "Students who are interested in pursuing a college major in science, technology, engineering or math (STEM), or data science and the social sciences, are strongly encouraged to consider a math course sequence that prepares them for calculus, either during high school or in their first year at UC." This reads as if they still believe that calculus should be the pinnacle of mathematics regardless of whether or not calculus is the most important mathematics course for a particular student (STEM or not).

Recently, BOARS has revisited its 2020 decision, spurred on partly by complaints from mathematicians who believe data science, which is classified as a statistics course, is dumbing down the mathematics curriculum. In 2023, more than 400 faculty from California institutions signed an open letter (Charikar et al. 2023), which argues, among other things, that the only reasonable path for any STEM major is the Algebra II to Calculus pathway. Roughly 55% of UC students are not, however, STEM majors (University of California 2024). The result was that in 2024, BOARS and UCOP (UC Office of the President) reversed their 2020 decision and declared that beginning with Fall 2025, only courses, such as Pre-Calculus or AP Calculus, that have elementary and advanced algebra and geometry as prerequisites, can be used to validate Algebra II (BOARS 2024).

The UC system doubled down on the calculus pathway, despite observations like those of mathematician David Bressoud (DeWitt Wallace Professor Emeritus, Macalester College) who explains how broken the calculus pathway really is. Bressoud recognizes that the "singular focus on calculus sucks the oxygen out of" building a strong curriculum for statistics and data science. He argues that a "truly co-equal path that develops computational and data skills" is needed (Bressoud 2020).

The consequences of the recent UC decision are that many school districts are dropping statistics and data science (and some computer science) courses. The hierarchy of courses now discourages school districts from spending money on courses that don't validate the UC Algebra II requirement. Unfortunately, in California, the UC requirements drive the high school curriculum, and the recent BOARS decisions will not be good for statistics and data science course offerings throughout the public schools.

Why the debate matters: consider sports gambling

The high school–university curricular debate aside, it is worth considering why the debate feels so important. The Stanford History Education Group did an extensive analysis to assess

[1] The 23 California State University campuses follow the same requirements.

[2] "validate" is the formal term used to indicate fulfilling a particular requirement.

[3] Area C represents the high school mathematics subject requirements for admission into the University of California system.

college students' online reasoning skills. The researchers found that the students' ability to reason about information on the internet was "bleak." The students were unable to reason through why they should or shouldn't believe a particular online claim. The study found that students accepted as truth the information presented to them, even when there was no supporting evidence or citations (Stanford History Education Group 2016). In many scenarios, an inability to discern online truths will not negatively impact one's life. There are some situations, however, where having a good sense of online scams can help a person avoid bankruptcy.

In May 2018, the US Supreme Court struck down the Professional and Amateur Sports Protection Act (PASPA), a law that prevented gambling on both collegiate and professional sports. In the wake of that decision, sports gambling has become ubiquitous, particularly within online platforms. That is, the dismantling of the regulation opened the doors, but online technology opened the flood gates. Websites like FanDuel and DraftKings make it remarkably simple to connect your bank account to the gambling platform, and they bombard you with exciting opportunities to win big.

One of the ways that online gambling platforms make money is through something called a parlay bet. A parlay is a type of bet in which multiple selections are made on different events (e.g., LA Dodgers win the game and Ohtani hits a home run at some point during the game and the total score of the game is fewer than 7.5 runs). It is difficult to win a parlay bet because each event must come out in your favor in order to win. As such, the platform offers long odds (extra payouts) for those rare occasions when a parlay bet succeeds. The long odds make the bet seem like a good idea to the average amateur gambler. Unsurprisingly to mathematicians, however, "the bookmakers are taking advantage of the increased risk involved in a parlay by offering lower odds" than the probability calculation would suggest (Leans.AI, n.d.). And certainly, the platform would not allow you to take the other side of the parlay bet. That is, the platform offers a big payout if your parlay wins, but if the betting market were even somewhat close to fair, the offer should be for a truly enormous payout if your parlay wins.

Understanding the concept of expected value (the long run average on the return of, say, a parlay bet) is paramount to being able to know whether the online gaming platforms are taking advantage of their users (spoiler: they are). Season 5 of Michael Lewis' podcast, *Against the Rules*,[4] walks through how being data illiterate leaves a person open to getting taken advantage of by online gaming platforms. He describes the tactics that the industry uses (e.g., not allowing large bets from individuals who win) to take advantage of a population of people who are not trained to understand critical reasoning through data. The podcast serves as a warning for anyone considering online sports gambling, but it is only one voice in a sea of industries set up to take advantage of people who are not trained to understand data, evidence, and reasoning—all important concepts taught in a data science course.

[4] Available at: https://www.pushkin.fm/podcasts/against-the-rules

Recommendation

In the end, I find the curricular part of the debate between Algebra II and Data Science to be distracting. The material in both classes is equally important. But I believe that the material in data science and statistics courses is more equally important, especially when it comes to serving the vast majority of high school students in California public schools. That is, I'd like to see us focus on how we can get every single high school student graduating with some kind of training in data. While I recognize that there is only so much space in a high school curriculum, I advocate for statistics and data training above most other things, including Algebra II. I worry that we do our students a disservice when we send them insufficiently prepared into a world optimized to take advantage of them. It is in our national interest to minimize the information asymmetry between the average patron and the industries who are using data against consumers. Let's teach our students what they need to know.

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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 from 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
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☐ 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

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ADDRESS CORRECTION FORM

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MAIL TO:

AWM
PO Box 40876
Providence, RI 02940

or E-MAIL:

awm@awm-math.org