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 treatment of women and others of marginalized genders and gender identities across the mathematical sciences.

IN THIS ISSUE

PRESIDENT'S REPORT

I write this still reeling from the loss of Georgia Benkart last month. Georgia was a force for good in the math community, and her gentle humor and abundant kindness made even the most tedious of tasks enjoyable.

Georgia received her PhD from Yale University under Nathan Jacobson, then joined the faculty at University of Wisconsin–Madison where she remained until her retirement. Her primary research area was in Lie algebras, where she contributed multiple key results. Her work, consisting of over 130 papers in Lie algebras, representation theory, and combinatorics, has been widely recognized: she was a Fellow of the AMS, an inaugural Fellow of AWM, an AWM-AMS Noether Lecturer, an MAA Pólya Lecturer, and an ICM Noether Lecturer.

Georgia's service to the profession is broad in scope. She was President of AWM from 2009–2011, during which time she helped launch the Research Symposia in honor of AWM's 40th anniversary. She later co-founded Women in Noncommutative Algebra and Representation Theory (WINART), one of AWM's very active research networks. She served as AMS Associate Secretary, 2010–2022, on the MSRI Board of Trustees, 2011–2022, and on the US National Committee for Mathematics of the National Academies, 2013–2020.

But she was so much more than her work. She was a friend, a mentor, an inspiration to many in our community. We will feel her absence for a considerable time to come. Georgia: Thank you for sharing your gifts with us! To read or contribute remembrances of Georgia, please visit https://math.wisc.edu/georgia-benkart-rememberances/. See also pp. 13–19.

Summer Conferences: By the time you read this, we will have held our sixth Research Symposium, in honor of AWM's 50th anniversary (delayed one year). The event is June 16–19 at IMA/University of Minnesota. A huge thanks goes to Katherine Dowd of the University of Minnesota math department, and to Dan Spirn of IMA, both of whom have been invaluable as we navigated the constantly shifting landscape of event planning during a pandemic. Thanks also to Darla Kremer and Samantha Faria who have kept things moving smoothly on the AWM side, and to the rest of the organizing committee: Alina Bucur, Cheri Shakiban, Ruth Haas, and Leslie Hogben.

When you read this, the annual SIAM meeting in Pittsburgh will be about to take place. AWM events, including the special session on Women in Graph Theory and Applications (WiGA), the graduate poster session, and mentoring session, were organized by our excellent SIAM Committee: Selenne Bañuelos, Katherine Benson, Lorena Bociu, Daniela Ferrero, Mary Ann Horn, Malgorzata Peszynska,

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ASSOCIATION FOR WOMEN IN MATHEMATICS

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

The *Newsletter* is published bi-monthly. Articles, letters to the editor, and announcements are welcome.

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

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PRESIDENT'S REPORT *continued from page 1*

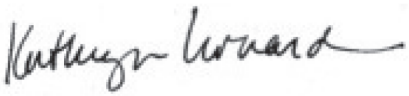
and Chrysoula Tsogka. We hope you also attend the Kovalevsky Lecture that will be given by Anne Greenbaum.

Our final summer conference event is MAA MathFest in Philadelphia. Our Falconer Lecturer (and former EC member), Suzanne Weekes, will give a stimulating lecture on "Continuity of Surfaces." We'll also present our Student Chapter Awards at the Friday ice cream social—the first time in two years that the awards will happen in person! Thanks to the MathFest Committee (at the time the planning took place): Shanna Dobson, Janet Fierson, Emelie Kenney, Cassie Williams and Sarah Wolff.

I hope to see many of you at these events. I know the pandemic continues its ebb and surge, and that not everyone has the privilege of spending time in groups of people. But in-person conferences are so important for building and reinforcing community. I hope we all can come together safely soon.

Speaking of community: I just returned home from a short trip to visit two good friends from graduate school. In the before time, we saw each other fairly regularly at conferences or other math-related events. Without those opportunities, we had to make a concerted effort to plan a visit. Both these women are incredibly accomplished, humble, kind, and open-minded. I realized during this visit what a gift it is that I feel like I can be completely myself with them—they will take me as I am with no judgement, they will tell me honestly but with kindness when I am making mistakes, they will share their opinions and advice without insistence that I do as they say. I feel incredibly lucky to have people like this in my life—I am quite sure I would no longer be in math without them—but I am also frustrated that these kinds of professional relationships are so rare. I hope each of you can find a small group of people to provide you with a similar kind of community. I hope that AWM can play at least a small role in helping you find such a group. It takes work to build these relationships, and it takes time to maintain them. The payoff, though, of having long-standing and deeply trusted connections in the math profession is invaluable.

Kathryn Leonard



Kathryn Leonard
May 24, 2022
South Pasadena, CA

Connecting the Community at JMM 2022

Darla Kremer, AWM Executive Director

The 2022 Joint Mathematics Meetings, scheduled to happen in Seattle in January, were postponed due to a renewed surge in the COVID-19 pandemic. Nevertheless, AWM volunteers adapted to host a number of virtual events in April. AWM is now a JMM partner organization along with the American Mathematical Society (AMS), American Statistical Association (ASA), Association for Symbolic Logic (ASL), Consortium for Mathematics and its Applications (COMAP), International Linear Algebra Society (ILAS), Julia Robinson Mathematics Festival (JRMF), Mathematical Sciences Research Institute (MSRI), National Association of Mathematicians (NAM), Pi Mu Epsilon (PME), Society for Industrial and Applied Mathematics (SIAM), Spectra (The Association for LGBTQ+ Mathematicians), and Transforming Post-Secondary Education in Mathematics (TPSE). Almost 20 percent of the scientific registrants at JMM 2022 were AWM members! And thanks to all of the partners and the various organizing and speaker selection committees, the JMM 2022 list of invited speakers (https://www.jointmathematicsmeetings.org/meetings/national/jmm2022/2268_invspeakers) provided a broad representation of our mathematical sciences community. Plan now to join AWM and all of the JMM partners in Boston, January 4–7 for JMM 2023!

Because of the switch to a virtual platform, the joint prize session was replaced by an excellent video of the winners, available on the JMM YouTube Channel https://www.youtube.com/channel/UCKxjz1WXZOKcAh9T9CBfJoA/videos). AWM prize winners and incoming AWM Fellows were also honored at the **AWM Reception and Awards Ceremony** this year, which was held virtually just after the AWM Poster Session and in conjunction with the annual AWM Business Meeting. This year, the AWM Workshop on **Women in Algebraic Geometry** featured scientific presentations in a wide range of topics in algebraic geometry. Details about the workshop and poster session appear in the article that follows.

The 2022 AWM-AMS Emmy Noether Lecture was delivered on April 7 by **Marianna Csörnyei** (University of Chicago). In this talk, "The Kakeya needle problem for rectifiable sets," Csörnyei described two variants of this problem, the geometric and the analytic versions, and described in each case the sets admitting the Kakeya property. A planar set admits the "Kakeya property" if it can be moved continuously to any other position covering arbitrarily small area during the movement. It was known for more than 100 years that line segments have this

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Membership Dues
Membership runs from Oct. 1 to Sept. 30
Individual: $70 **Contributing:** $160
Family, new member, and reciprocal (first two years): $35
Affiliate, retired, part-time: $30
Student, unemployed: $20
Outreach: $10
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Category 1: $325
Category 2: $325
Category 3: $200
Sponsoring: $3000+

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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.

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Editorial: 24th of January, March, May, July, September, November
Ads: Feb. 1 for March–April, April 1 for May–June, June 1 for July–Aug., Aug. 1 for Sept.–Oct., Oct. 1 for Nov.–Dec., Dec. 1 for Jan.–Feb.

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

2022 AWM-AMS Noether Lecturer
Marianna Csörnyei

property, but until recently there were only very few other known examples. If you missed this amazing talk, it is also posted on the JMM YouTube Channel.

In addition to the AWM Workshop and Poster Session, several AWM special sessions were organized and endorsed by the AWM as events that make a significant effort to promote women in mathematics or to encourage diverse participation: AWM had special sessions on *Women in Geometry*, organized by **Catherine Searle**, **Elizabeth Stanhope**, and **Guofang Wei**; *Mathematics in the Literary Arts and Pedagogy in Creative Settings*, organized by **Shanna Dobson** and **Elizabeth Donovan**; *Women in Mathematical Biology*, organized by **Christina Edholm**, **Heather Zinn Brooks**, **Amanda Laubmeier**, **Maryann Hohn**, and **Carrie Manore**; *Women and Gender Minorities in Symplectic and Contact Geometry and Topology*, organized by **Orsola Capovilla-Searle**, **Dahye Cho**, and **Angela Wu**; *Women in Topology*, organized by **Kristine Bauer**, **Anna Marie Bohmann**, **Angélica Osorno**, **Carmen Rovi**, and **Sarah Yeakel**; *Women of Color in Combinatorics*, organized by **Shanise Walker** and **Zhanar Berikkysy**; and *Women in Computational Topology*, organized by **Lori Beth Ziegelmeier** and **Brittany Terese Fasy**. Finally, a celebratory special session, *Celebrating the Mathematical Contributions of the AWM*, was organized by the Chief Editors of *La Matematica*, **Michelle Manes**, **Donatella Danielli**, **Kathryn Leonard**, and **Ami Radunskaya**.

The **AWM Executive Committee Meeting** was held virtually on January 8, as originally scheduled. The EC welcomed the newly elected members of the Executive Committee, AWM President-Elect, **Talitha Washington**, Clark Atlanta University and Atlanta University Center Data Science Initiative, AWM Clerk, **Alejandra Alvarado**, Eastern Illinois University, and newly-elected Members-at-Large **Rebecca Garcia**, Sam Houston State University and MSRI-UP, **Courtney Gibbons**, Hamilton College, **Caroline Klivans**, Brown University, and **Shanise Walker**, University of Wisconsin–Eau Claire.

ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM ONLINE

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AWM DEADLINES

RCCW Proposals: July 1, 2022
and January 1, 2023
AWM Workshop at JMM:
August 15, 2022
AWM-AMS Noether Lecture:
October 1, 2022
AWM-MAA Falconer Lecture:
October 1, 2022
AWM-SIAM Kovalevsky Lecture:
October 1, 2022
AWM Alice T. Schafer Prize:
October 1, 2022
AWM Dissertation Prize: October 1, 2022
AWM Travel Grants: October 1, 2022
and February 1, 2022
AWM Workshop at SIAM:
October 1, 2022
Ruth I. Michler Memorial Prize:
October 1, 2022

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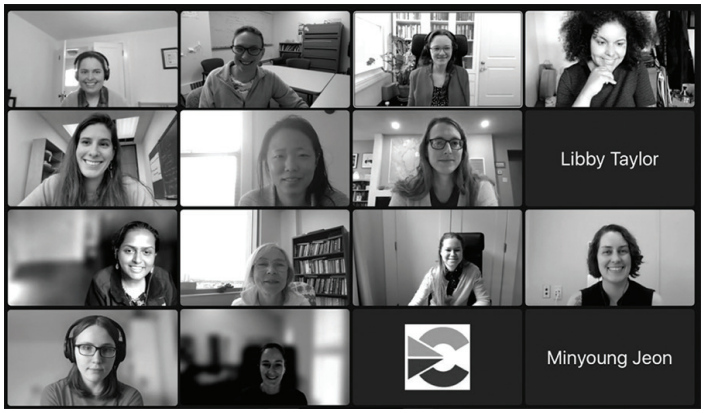
AWM Workshop at the 2022 Joint Mathematics Meetings

Matthew Krauel (California State University at Sacramento), Julie Rana (Lawrence University), Radmila Sazdanovic (North Carolina State University), Janet Striuli (Fairfield University), and Isabel Vogt (Brown University).

The 2022 Joint Mathematics Meetings were held virtually April 6–9, 2022. The two-day AWM Workshop included an **AWM Special Session on Women in Algebraic Geometry** split over Friday and Saturday mornings, and a Gather.Town reception and **Poster Session** for graduate students on Friday evening. 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.

This year's special session was organized by **Julie Rana** (Lawrence University) and **Isabel Vogt** (Brown University), building on the research activities at the Women in Algebraic Geometry (WiAG) workshop, hosted virtually through ICERM in July 2020 and sponsored by the AWM-NSF ADVANCE grant. The JMM AWM workshop provided opportunities for former participants in the WiAG workshop and other women mathematicians in algebraic geometry to come together, exchange research ideas, and engage in mentoring activities. Several talks featured research initiated in 2020, which by now came to fruition. Speakers and participants engaged enthusiastically in the day's events, discussing new mathematics and forging new professional connections.

The workshop featured scientific presentations in a wide range of topics in algebraic geometry. Curated talks were given by **Ursula Whitcher** (Mathematical Reviews, AMS), **Juliette Bruce** (University of California, Berkeley), **Jennifer Li** (Princeton University), **Ashley K. Wheeler** (Georgia Tech), **Kristin DeVleming** (University of Massachusetts, Amherst), **Hannah K. Larson** (Stanford University), **Libby Taylor** (Stanford University), **Shiyue Li** (Brown University), **Montserrat Teixidor i Bigas** (Tufts University), **Sarah Frei** (Rice University), **Alexandra Viktorova** (Stony Brook University), **Padmavathi Srinivasan** (University of Georgia), and **Brooke Ullery** (Emory University).



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 **Leslie Hogben** and **Ulrica Wilson**.

The graduate student poster portion of the AWM Workshop remains open to all areas of mathematics, but often includes a number of participants from the special session theme. This more focused and integrated approach fosters networking among participants in the selected topical theme and allows for further mentoring from women leaders in the field. The Friday night Graduate Poster Session was organized by **Irina Mitrea** (Temple University), **Julie Rana** (Lawrence University), **Radmila Sazdanovic** (North Carolina State University), **Janet Striuli** (Fairfield University), **Isabel Vogt** (Brown University), and poster judging coordinator, **Matthew Krauel** (California State University at Sacramento). The poster session involved 15 women graduate students and had an asynchronous format. Participants met twice with the organizers prior to the JMM, virtually, in order to discuss best practices for poster presentations and strategies to make the best out of their JMM experience. Adapting to the virtual setting of the meetings this year, poster presenters prepared pre-recorded presentations to accompany their posters. Graduate student participants formed peer teams of three with the goal of providing each other with feedback while preparing the video recorded presentations.

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AWM WORKSHOP AT THE 2022 JMM

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Judges were able to view the presentation materials, score the posters and provide feedback at a more leisurely pace than normal! The judging group then came together virtually to collaboratively decide on the winners. At the Workshop reception on Friday evening the graduate students presented summaries of their posters to the JMM audience.

At this edition of the JMM the poster presenters were: **Amanda L. Colunga** (North Carolina State University), **Emily Beatrice Crawford Das** (University of Georgia), **Aleyah Dawkins** (George Mason University), **Drew Horton** (University of Colorado, Denver), **Dionne F. Ibarra** (George Washington University), **Minyoung Jeon** (Ohio State University), **Lara Kassab** (Colorado State University), **Sefika Kuzgun** (University of Kansas), **Tracey G. Oellerich** (George Mason University), **Ella Pavlechko** (North Carolina State University), **Abba I. Ramadan** (University of Kansas), **Chathuri Sandamali** (Texas Tech University), **Sarah L. Strikwerda** (North Carolina State University), **Cigole Thomas** (George Mason University), and **Elise Walker** (Texas A&M).

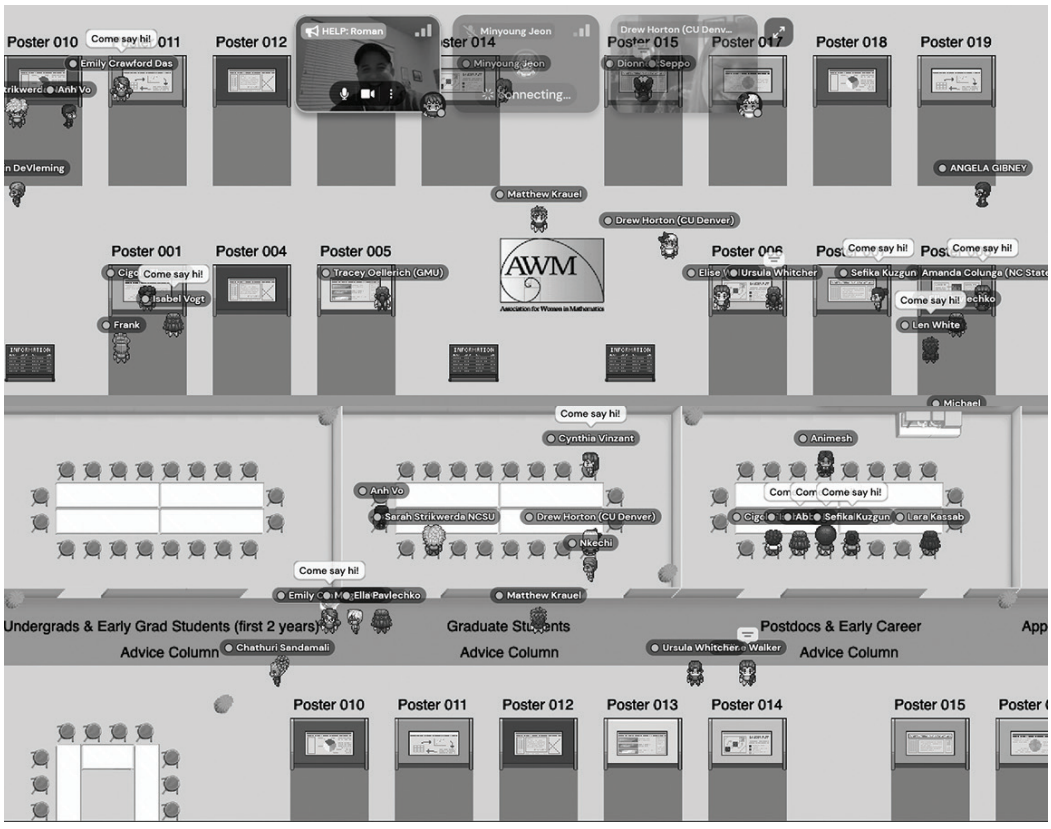
This year's top three posters were **Elise Walker** (Texas A&M), **Cigole Thomas** (George Mason University), and **Ella Pavlechko** (North Carolina State University).

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

A special thanks to the volunteer judges Kimberly Ayers, Sara M. Clifton, Jessica Conway, Kristin DeVleming, Megan Kerr, Hyun Kwon, Amanda Laubmeier, Kathryn G. Link, Gabriel de Oliveira Martins, David Murrugarra, Eliza O'Reilly, Iordanka Panayotova, Keri Sather-Wagstaff, Jennifer Schultens, Isabel Vogt, and Lihong Zhao, who invested their expertise and time to review the poster presentations and offer pointed and helpful feedback to the students.

The 2022 AWM workshop was made possible by funding from the National Science Foundation through the Division of Mathematical Sciences grants "Mathematical Connectivity through Research and Equity for Women" (NSF-DMS 2113506) and "Expanding Research and Professional Opportunities for Early-Career Female Mathematicians" (NSF-DMS 1953892).

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



The virtual space of the poster session at Gather

BOOK REVIEW

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

Building Gender Equity in the Academy: Institutional Strategies for Change, by Sandra Laursen and Ann E. Austin, Johns Hopkins University Press, 2020. ISBN 978-1421439389

Reviewer: Marge Bayer

Since 2000, the National Science Foundation has funded university programs for addressing gender equity in STEM through ADVANCE: Organizational Change for Gender Equity in STEM Academic Professions. Laursen and Austin studied ADVANCE programs with start dates from 2001 to 2018. (Awards are made for 5 years.) The book can be used as a guide for institutions that want to pursue changes for equity, whether applying for ADVANCE funding or not.

Part I: The Problem, the Solution and the Study provides an overview. In particular, it lays out barriers for women on STEM faculties: bias in evaluation, masculinized workplace culture and climate, work-life conflict and career inflexibility, inadequate resources for individual success, and "the double bind" (intersection of gender with race and other identity categories). It stresses the need to "fix the system, not the women," that is, to make changes in the institution, not just to train women to fit into the system.

Part II: Strategies for Change categorizes the strategies used in the various ADVANCE projects. I will not list the 12 strategies listed—one can find them in the table of contents for the book.[1] Each section presents rationale, purpose, audience, models, examples, evaluation, affordances and limitations, summary and some references. For each of these strategies and in each of these sections, the authors bring in examples from different ADVANCE sites. Thus, the book uses this breakdown into strategies to compare approaches at different institutions to similar objectives. However, this approach makes it hard to see how the different interventions work together to achieve the overall goals of the programs.

Part III: Building and Enacting a Change Portfolio remedies this with descriptions of the projects at three institutions: Case Western Reserve, University of Texas at El Paso, and University of Wisconsin at Madison. The three were

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[1] https://www.press.jhu.edu/books/title/12279/building-gender-equity-academy

CALL FOR NOMINATIONS

The 2023 Kovalevsky Lecture

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

The mathematicians who have given the prize lecture in the past are: Linda R. Petzold, Joyce R. McLaughlin, Ingrid Daubechies, Irene Fonseca, Lai-Sang Young, Dianne P. O'Leary, Andrea Bertozzi, Suzanne Lenhart, Susanne Brenner, Barbara Keyfitz, Margaret Cheney, Irene M. Gamba, Linda J.S. Allen, Liliana Borcea, Éva Tardos, Catherine Sulem, Lisa Fauci, and Vivette Girault. The 2022 lecture will be delivered by Anne Greenbaum.

The lectureship may be awarded to anyone in the scientific or engineering community whose work highlights the achievements of women in applied or computational mathematics. Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be an additional letter of support. Nominations of members of underrepresented minorities are especially encouraged. The nomination must be accompanied by a written justification and a citation of about 100 words that may be read when introducing the speaker. Nominations are to be submitted as ONE PDF file via MathPrograms.Org. The submission link will be available 45 days prior to the deadline. Nominations must be received by **October 1, 2022** and will be kept active for two years.

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

among 15 in-depth case studies carried out by the authors and were chosen to represent different types of universities (private, public regional and public flagship). Since the research of the programs looked at completed projects and sustainability after the end of the NSF funding, these projects were among the earlier ADVANCE projects, with starting dates of 2002 or 2003. The last chapter presents suggestions and guidelines for future efforts at institutional transformation.

We know that some problems with gender equity in academic STEM have to do with the pipeline. In the early years, the ADVANCE proposals could include efforts targeted at students, with the goal of increasing the pool of STEM faculty. Later, funding that directly supported students was excluded. It was hoped that improving the representation and status of women faculty in STEM would encourage women students to follow this career path. I liked the observation that we need many role models so that students and early career women can see opportunities "without expecting their role models to be flawless." [pp. 20–21]

Many, if not all, ADVANCE programs included a component of training on implicit bias. (The authors note the superfluity of the adjective: "implicit or unconscious bias (or, more simply, bias).") It is pointed out that men benefit from positive biases and that a small amount of bias compounds to be quite significant. Training on bias can be more effective if it focuses on bias in hiring rather than in promotion or salaries, because "it may be less sensitive to consider bias in evaluating still-unknown job applicants rather than known faculty colleagues who are candidates for advancement or awards." [p. 55] The hope is that raising consciousness about bias in the hiring context will lead to recognition in other contexts. The authors note that while all of us operate with implicit bias, women are more likely to acknowledge it when presented with the evidence. Bias training needs to be carefully designed and coupled with accountability processes. It can backfire if faculty perceive it as being just another hoop to jump through, or, worse, if they see it as an attack on standards.

The book emphasizes the importance of leadership on the issue of gender equity at higher ranks in the administration. It shows examples of universities that institutionalized programs initiated during the ADVANCE grant, to continue after the grant in faculty development or diversity offices. Many universities without ADVANCE grants have in recent years created offices where these kinds of efforts could be housed. (I cannot resist complaining that the solution to all problems is to hire another senior administrator.) The last chapter on recommendations for undertaking institutional change does not address how to work within these structures. For example, my university has a Vice Provost for Diversity, Equity, Inclusion and Belonging. How can we work with that office to implement the strategies that have been proven to work by the ADVANCE programs?

One difficulty in implementing programs to increase female or minority representation is that fear of stigma can keep people from taking advantage of the programs. This is particularly true if the programs are seen as giving advantage to one group as opposed to overcoming disadvantage. Programs that try to accommodate child-bearing and child-care responsibilities are examples. At many institutions parental leave and/or delays in the tenure clock are available to parents of all genders. There are concerns that some men have used these policies for extra time to complete more research, without actually devoting substantial time to child care. The authors quote research that such gender-neutral policies increased the gender gap in economics.[2] On the other hand, some women avoid using family-friendly policies for fear that using them will signal that they are less committed to their careers. Another issue with the delay in the tenure clock (not mentioned in the book, I believe) is the fear that expectations for research productivity will be increased commensurate with the additional time to tenure.

The stigma issue applies, of course, to dual career hires. The book includes some discussion about the differences in the handling of spousal hires (and the associated salaries), depending on whether the initial candidate is male or female. It is important that colleges and universities have clearly announced policies; such policies signal commitment to equity, even to candidates who are not looking for spousal accommodation. Institutions should recognize the success of spousal hires and combat erroneous presumptions that departments sacrifice quality for the satisfaction of the couple. In fact, studies show that dual-career couples are successful and even more likely to attain tenure. The book notes that colleges and universities may approach the issue of spouses differently depending on geography. An institution in a rural area, or far from other universities or professional employers, probably needs to focus on finding positions within the university. In metropolitan areas, alternatives might be found with other universities or businesses, but this is easiest when the university maintains good working relationships with other employers.

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[2] H. Antecol, K. Bedard, and J. Stearns. Equal, but inequitable: Who benefits from gender-neutral tenure clock stopping policies? *American Economic Review*, 108(9): 2420-2441, 2018.

There is very little in the book about the issue of equitable salaries. A couple of universities are reported to have regular salary equity reviews. At Case Western Reserve, "hotline" coaching could include advising on salary negotiation, and perhaps other universities also address the issue in their training sessions. In a few cases, review of start-up packages was mentioned.

Here are some of the more interesting or unusual practices that are described in the book. The University of Nebraska Lincoln presented data to individual departments about demographics in the field, when they found that faculty underestimated numbers of potential job candidates among women and others of underrepresented groups. The University of Montana has a "two-for-one" policy that allows hiring two candidates from one search, if both candidates contribute to the department's diversity. (This goes beyond spousal hires; unrelated candidates could be hired at the same time.) The University of Michigan worked with an on-campus theater group to develop theater presentations, including one dealing with gender dynamics in faculty meetings on recruiting and promotion. A few universities established programs to enhance connections of pre-tenure faculty with senior scholars in their research area. At the University of Montana, the senior scholar would be invited to campus to give a lecture and to meet with the young faculty member, and funding would be provided for the young faculty member to visit the senior scholar at their institution. Other universities extend mentor programs to associate professors, or develop intervention strategies for faculty who seem stuck at the associate level. Case Western Reserve established a minority faculty exchange program with minority-serving institutions.

Some of the ADVANCE projects have disseminated the lessons from their experience; the book provides links to a number of resources. I include here just a few.

Georgia Tech, ADEPT: Awareness of Decisions in Evaluating Promotion and Tenure
https://adept.gatech.edu/

University of California Center for WorkLife Law, Hastings School of Law Tools for Change
https://toolsforchangeinstem.org/

Kansas State University, Gender Equity Website Evaluation Rubric
https://www.k-state.edu/kawse/advance/publications/docs/website-rubric.pdf

Hunter College Gender Equity Project Flux Charts
https://www.hunter.cuny.edu/genderequity/initiatives/benchmarks

Hunter College Accountability Principles and Actions for Chairs and Unit Heads
https://www.hunter.cuny.edu/genderequity/repository/files/equity-materials/chairacc.909.pdf

The AMS *Notices* also published an opinion piece by Darryl Yong and Sumun Pendakur with recommendations on diversity in hiring. https://www.ams.org/publications/journals/notices/201708/rnoti-p897.pdf

Laursen's and Austin's book and the many sources cited there comprise an excellent resource for departments and universities wishing to address equity issues effectively. Whether you are involved in launching a major project, or wish to contribute to ongoing efforts at your institution, I recommend consulting this book.

Comics&Science: The Mirzakhani Issue

https://umi.dm.unibo.it/2022/04/21/may12-mirzakhani/

On May12, the International Day of Women in Mathematics, Unione Matematica Italiana (UMI), in collaboration with Consiglio Nazionale Delle Ricerche and *Comics&Science*, created a special issue with a comic story about Maryam Mirzakhani. By Silvia Ziche and Davide La Rosa, it is available for online reading and download at the url in the byline.

What is mathematical billiards? What trajectory does the ball make when bouncing off its tables? Is it possible to find a billiard table where, given the starting point of the ball, there are inaccessible points? And what do donuts and pretzels have to do with it? Some of these curious questions—actually, profound mathematical questions—were sought by mathematician Maryam Mirzakhani, the first woman to win the Fields Medal. Maryam Mirzakhani was an outstanding mathematician, one of the most notable minds of this millennium, and May 12, 1977 is her date of birth. When she died on July 15, 2017, the pain in the mathematical community was so enormous that in 2018, on the occasion of the first World Congress of Women in Mathematics, it was decided that May 12 would become the date on which to celebrate all the women in mathematics.

EDUCATION REVIEW

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

Curating Data Sets for Classroom Use

Anna Bargagliotti, Professor of Mathematics, Loyola Marymount University, Anna.Bargagliotti@lmu.edu

In 2021, this column discussed the beginning of a movement to include data science in the school curriculum. Since then, several states have revised their standards to include more statistics and data science (e.g., Georgia, Oregon, Tennessee) and others are in the process of proposing changes (e.g., California). As data science moves into the K–12 curriculum, we must consider how to curate data sets that are rich enough and complex enough for teaching data science concepts, but also appropriate for classroom use and manageable enough for teachers to use. This is a difficult balance to strike.

As secondary data becomes more prevalent in our daily lives, facilitating teaching and learning with secondary data gains importance. In fact, current guidelines (GAISE II, 2020) encourage the use of complex secondary data. Secondary data refers to data not collected by the students themselves. While secondary data has always been used for teaching, such data sets have often been small or cooked up specifically for teaching. Now, data science necessitates secondary data sets that are real, large, and complex. Classroom ready data sets of this type are hard to come by.

In this article, we introduce a secondary data set that can be used at the upper secondary and post-secondary level to examine data provenance, an important data science concept, as well as a plethora of other statistical concepts.

Data Provenance

The GAISE II report put forth a framework for the teaching and learning of statistics and data science in pre-K–12 anchored within the Statistical Problem-Solving Process, which is defined by four components: formulating statistical investigative questions, collecting/considering data, analyzing data, and interpreting results. See Figure 1 below:

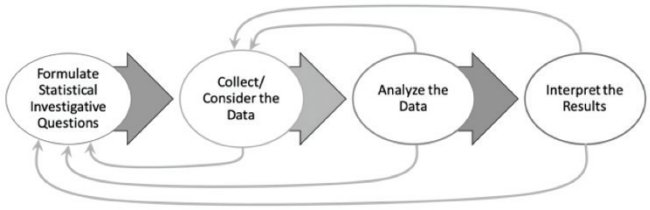

Figure 1: The Statistical Problem-Solving Process (Bargagliotti et al. 2020, 13)

When working with secondary data, t*he Consider the D*ata component becomes particularly important, but is often skipped over in the classroom. Students need to develop the habit of investigating the source of data because the provenance of secondary data affects the types of questions that can be asked and answered using the data. Too frequently,

CALL FOR PROPOSALS

Research Collaboration Conferences for Women

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

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

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

little time is spent understanding the origins of a data set before it is used by students. While it might seem simple to adopt a secondary data set for classroom use, in fact, many challenges can arise. One challenge is sifting through the data documentation to understand the origins of the data. Dedicating ample classroom time to questioning the provenance of data (i.e., truly understanding data origins and study design) is certainly worthwhile.

American Time Use Survey (ATUS) Data Set

"What's Going on in This Graph?" (WGOITG) is an ongoing collaboration between t*he New York Times* (NYT) and the American Statistical Association (ASA). On a weekly basis, a data visualization that appeared somewhere in the NYT is presented and the ASA hosts a moderated live discussion of the visualization for students. The September 15, 2021, WGOITG post (https://www.nytimes.com/2021/09/09/learning/whats-going-on-in-this-graph-sept-15-2021.html), for example, used data from the U.S. Bureau of Labor Statistics' American Time Use Survey (ATUS) (https://www.bls.gov/tus/) to address the question of how the coronavirus pandemic changed how people in the United States spent their free time. The graphic shows the amount of time people in different age brackets (15–24, 25–44, 45–64, 65+) spent per day in 2019 and 2020 on texting, phone calls and video chats, exercising, and grooming themselves. Five different variables are used in the graphic: age group; year; time spent on texting, phone calls, and video chats; time spent exercising; and time spent grooming.

How such a visualization can be a starting point for discussing complex data in the classroom is described in a forthcoming paper by Arnold et al. (2022). They suggest having students interrogate the data used to create the visualization and investigate the provenance of the data by asking questions:

1. What was the purpose for collecting the data? (Initial investigator's problem/purpose)
2. Who collected the data?
3. Who funded the data collection and research?
4. Was the data collected using an observational study or an experiment?
5. Who was the data collected from?
6. When was the data collected?
7. Where was the data collected?
8. How many people participated?

Students can often answer some of these questions directly from the data visualization while others may require some background research. For the September 15th WGOITG visualizations, Arnold et al. note that:

1. the data were collected to examine the way those in the US spend their time,
2. the data were collected by the U.S. Department of Labor Bureau of Labor Statistics,
3. the data were funded by the U.S. Department of Labor Bureau of Labor Statistics,
4. the data were collected via a survey (an observational study),
5. the data were collected from American citizens 15 years and older,
6. the data were collected in 2019 and 2020,
7. the data were collected in America,
8. the visual does not state how many people participated

More in-depth data provenance questions can be investigated using ATUS Survey Documentation provided at https://www.bls.gov/tus/documents.htm. The ten linked resources available there range from a User's Guide to variable codes to the ATUS Questionnaires (see list below). Using the links provided, students can examine these items to begin to understand the complexity of the data collection.

ATUS Survey Documentation

ATUS User's Guide (PDF)
ATUS Coding Lexicons
ATUS Data Dictionaries
ATUS Questionnaires
ATUS Coding Rules Manuals
ATUS Frequently Used Variables (PDF)
Changes between the ATUS Single-Year Data Files (PDF)
Conversion Chart: Fraction of an Hour to Minutes (PDF)
Census Industry and Occupation Codes
Handbook of Methods: American Time Use Survey

Good statistical practice involves looking at the data documents to understand how the data were collected, what survey questions were used, and how the data were recorded. Students can be encouraged to read Chapter one of the User's Guide and to explore sections of the questionnaires that are of interest. From this data documentation, students will find out that approximately 600,000 people are included in the data set.

Curating and Preparing Data for Classroom Use

All data needs to be curated and prepared before using it for analyses. Classroom data is no different. While the ATUS data is available and downloadable at the U.S. Bureau

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of Labor Statistics and the data.gov websites, preparing such a complex data set for classroom use involves additional work that requires skills in coding, data wrangling, and patience. For example, variables may need to be recoded, missing values need to be attended to, the data may need to be filtered to include only variables that are of interest, the data may need to be merged, or new variables may need to be defined. Erikson et al. (2019) define these steps as data moves and argue that they are central to data preparation. As such, an important contribution made by Arnold et al. was to clean the data to be ready for classroom use. At https://www.amstat.org/education/guidelines-for-assessment-and-instruction-in-statistics-education-(gaise)-reports, teachers and students can download two data sets—the full cleaned data set of 600,000 people or a random sample of the full data set that includes 4,000 people. Using the sample curated dataset, students can then investigate the ATUS data to pose and answer statistical investigative questions and draw inferences about the full ATUS dataset.

Conclusion

Because secondary data is so prevalent, it is important for students to understand how to engage with it properly. The GAISE II Statistical Problem-Solving Framework has Considering Data as one of its main components. As part of this component, students should investigate the source of the data when possible. Interrogative questions can be used to understand the origin of secondary data sets and gain a more complete picture of the scope of the data. In general, complex secondary data sets will require special preparation for successful classroom use. The ATUS data set has been recently prepared for classroom use. More data sets of this type are certainly needed and hopefully others will be encouraged to take on the task of curation.

References

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Arnold, P., Bargagliotti, A., Franklin, C. & Gould, R. (forthcoming). Bringing Complex Data Into the Classroom. *Harvard Data Science Review*.

Erickson, T., Wilkerson, M., Finzer, W., & Reichsman, F. (2019). Data moves. *Technology Innovations in Statistics Education*, 12(1).

CALL FOR NOMINATIONS

The 2024 Noether Lecture

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

The mathematicians who have given the Noether lectures in the past are: Jessie MacWilliams, Olga Taussky Todd, Julia Robinson, Cathleen Morawetz, Mary Ellen Rudin, Jane Cronin Scanlon, Yvonne Choquet-Bruhat, Joan Birman, Karen Uhlenbeck, Mary Wheeler, Bhama Srinivasan, Alexandra Bellow, Nancy Kopell, Linda Keen, Lesley Sibner, Ol'ga Ladyzhenskaya, Judith Sally, Olga Oleinik, Linda Rothschild, Dusa McDuff, Krystyna Kuperberg, Margaret Wright, Sun-Yung Alice Chang, Lenore Blum, Jean Taylor, Svetlana Katok, Lai-Sang Young, Ingrid Daubechies, Karen Vogtmann, Audrey Terras, Fan Chung Graham, Carolyn Gordon, Susan Montgomery, Barbara Keyfitz, Raman Parimala, Georgia Benkart, Wen-Ching Winnie Li, Karen E. Smith, Lisa Jeffrey, Jill Pipher, Bryna Kra, Birgit Speh, and Marianna Csörnyei. The 2023 lecturer will be Laura DeMarco.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be an additional letter of support. Nominations of members of underrepresented minorities are especially encouraged. The letter of nomination should include a one-page outline of the nominee's contribution to mathematics, giving four of her/their most important papers and other relevant information. A curriculum vitae of the candidate not to exceed three pages is also required. Nominations are to be submitted as ONE PDF file via MathPrograms.Org. The submission link will be available 45 days prior to the deadline. Nominations must be submitted by **October 1, 2022** and will be held active for three years (two years beyond the initial nominations). If you have questions, phone 401-455-4042, email awm@awm-math.org or see the website https://awm-math.org/awards/noether-lectures/

Remembering Georgia

Anne Leggett, Newsletter Editor

As Kathryn said to begin her report, many of us are still reeling from the loss of Georgia Benkart. I had been expecting to see her at breakfast with the usual gang of graduate school friends at the Boston JMM next January, with she and I laughing about having reached the 3/4 century mark during 2022. We met during Fall Quarter 1966 at a softball field at the Ohio State math department honors student picnic; she was a year behind me, in the same class as my brother Bill, due to her birthday being in December. She and her sister Paula (not a mathematician, but she found our crowd congenial), and me and my brother Bill, were all attendees at numerous math honors parties. Then she arrived at Yale a year behind me, so we saw even more of each other, although we were in different fields.

Her research career has been stellar. We're all happy that she had been able to see the celebratory article about her mathematics in the March 2022 *Notices*: "Gems from the Work of Georgia Benkart" (https://www.ams.org/journals/notices/202203/rnoti-p375.pdf). Both of us have been pleased with our contributions to the profession, in our own differing ways. After leaving Yale, we continued to see each other off and on at various meetings. We became much closer when she became president of AWM in 2009, especially when my dear husband was diagnosed with cancer and began his arduous treatments. She came to his funeral in fall 2010 both as representative of AWM and as friend. My brother Bill had died young, and she spent a lot of time with my mother at the reception after Gerry's funeral, reminiscing with Mom about Bill. That was typical of the wonderful kindness that Georgia often displayed.

Since then, I've seen her at many JMMs, usually sharing breakfast with friends, as she was so busy with official duties that this was the only time she had available. But it was always important to her that we all could meet for a meal, rather than just at those random moments when you run into each other on the way from here to there. One time she was staying in Evanston while here for some professional reason at Loyola University Chicago, and we had brunch before she had to head out to the airport (to catch a bus to get back to Madison, that tickled me), where she pointed out that we had known each other for 50 years now. I guess that means it was 2016! The last time I saw her in person was at the 2020 JMM, before the pandemic changed the world. But we exchanged numerous emails, as until fairly recently, she continued to be an active member of the extended newsletter team that I ask for help each issue with proofreading. So we kept up a bit with each other's lives that way.

It was such a shock one day to see a string of emails in my inbox with her as the subject. I just felt instantly that it couldn't be good news, and was so sorry that I was right. It was indeed a sad day for me and many others.

Georgia was one of the hardest-working people I've ever known, although always making time for friends and family. To honor her memory, and to give some sense of her to those who may not have worked with her closely, I'd like to reprint her last president's report here. She was a very private person, but she was rightfully proud of her professional accomplishments. Georgia, we will miss you.

Reprint of "President's Report," Georgia Benkart, January–February 2011 AWM Newsletter

"When you have completed 95% of your journey, you are only halfway there," so says a Japanese proverb based on rather unconventional arithmetic and oft quoted by blogs, athletes, and even one car-care forum. Twelve *Newsletter* issues ago, i.e. two years ago, I began my AWM presidential journey, which will be almost finished when this issue goes to press. If lessons do come from the journey rather than from the final destination, then I've learned far more than I could ever have imagined, even though I may be only halfway there.

In my first *Newsletter* report, I took a look towards the future and envisioned some goals for AWM. Among them were:

Revitalization and renewal of AWM's membership

Regular individual membership for the year just completed (October 1, 2009 to September 30, 2010) was up 12%, while institutional membership remained at exactly the same level as for the previous year. Both figures are especially heartening in these economically challenging times and reflect efforts undertaken on many fronts to heighten awareness of the benefits of joining AWM. Fewer schools were able to afford extra student memberships, which showed a sharp decline. This comes at a time when student interest in AWM is growing, and new student chapters are joining AWM; in fact, six have done so in 2010 (Worcester Polytechnic Institute, University of California Berkeley, University of Illinois at Urbana Champaign, North Carolina State University, Denison University, and Mills College). Work is underway to streamline the chapter application process. Obtaining funding to support the activities of our student chapters remains, unfortunately, far less than halfway there.

Last year, AWM embarked on a reciprocal membership agreement with SIAM for women and men interested in belonging to both societies. SIAM's current membership is only about 10–15% women, while the number of AWM

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members working in industry and in governmental labs and offices is quite small. Both societies wanted this to change. Preliminary figures for the AWM membership year that started October 1 are starting to show the positive effect of the AWM-SIAM reciprocal agreement in attracting new members to AWM.

At its November meeting, the AWM Executive Committee approved "Affiliate Membership Agreements" which will be negotiated with certain (foreign) mathematical societies whose missions are similar to AWM's. Such an agreement will enable members of an affiliated society living outside the United States to join AWM at a discounted rate and AWM members to join the other society with certain benefits. The discussions in August at the International Congress of Women Mathematicians (ICWM) at Hyderabad, India, highlighted awareness of the great commonality to the issues women face (and so, let's hope, to their solutions), the strong interest in collaboration to address these issues, and the enormous need for communication and sharing information. In the coming months, AWM hopes to negotiate such membership agreements with several societies with which it has sponsored activities in the past.

Making sure in these tough economic times AWM remains financially healthy

This has been one of the most challenging parts of the journey and, on many stretches of the road, virtually an uphill climb. Revenue from job advertisements plummeted as there was an almost 50% drop in the number of academic job openings in both 2009 and 2010 compared to 2008 figures. Further compounding the decline in income were the changes in the funding policies of several federal granting agencies that resulted in reductions in the amount of staff costs that could be billed to grants and the withdrawal of funds for our Sonia Kovalevsky Days due to a court ruling challenging the program that had supported them. Our members have responded with deeply appreciated generosity, and I hope will continue to do so. In February 2010, AWM received an extraordinary bequest from the estate of Alice T. Schafer. In 2009, Math for America and Microsoft Research joined the ranks of our sponsors, and Brown University and MSRI became sponsors this year. We are very grateful to the Exxon-Mobil Foundation, National Institute of Standards and Technology, and Metron for their longstanding support of AWM and to the Department of Energy, National Science Foundation, National Security Agency, and Office of Naval Research, all of whom have awarded grants to AWM for its programs. We continue actively seeking support from corporations, foundations, institutions, and additional governmental sources.

Overhauling AWM's website and preserving AWM's history

The wonderful new AWM website has been up and running since early September thanks to the efforts of volunteers at Google and many AWM folk. For the first time, in November the *Newsletter* became available to members online. With the generous support of AWM past president Jean Taylor, AWM has undertaken the digitizing of back issues of its newsletters (pre-pdf, and printed in various and sundry formats). That project is now complete, and we anticipate that access to all the newsletters, from the very first to the November–December 2009 issue, soon will be available to *everyone* through our website. The current year's issues will remain embargoed and will be accessible to members only.

The digitized newsletters showcase AWM's rich heritage and provide an excellent chronicle of the journey women have made in mathematics during the last 40 years. As I wrote 12 issues ago, "It is impossible to overestimate the value of the *Newsletter*, AWM's signature product, in creating awareness, recording our collective history, fighting feelings of isolation, and inspiring us with news of the accomplishments of women in the mathematical sciences. It is also impossible to pay the debt of thanks owed Anne Leggett for her over thirty years of dedicated work as Newsletter Editor." After working with Anne the last two years, I am in even greater awe of the job she has done for more than 33 years.

The Newsletter Team was established last year to assist with such editorial tasks as proofreading and soliciting articles. We are very grateful that Sarah Greenwald, an AWM Executive Committee member and one of the Newsletter Team members, recently agreed to become its Associate Editor. Currently Sarah is hard at work with her colleague at Appalachian State University Jill Thomley on *The Encyclopedia of Mathematics and Society*, a new reference work on the role of mathematics in everyday life, slated to be published by Salem Press in 2011. She will start her Associate Editorship when that project is completed in early 2011. Sarah was a 2005 recipient of the MAA's Henry L. Alder Award for Distinguished Teaching and this year received Appalachian State's Wayne D. Duncan Award for Excellence in Teaching in General Education. But no doubt many of you know her as "*The Simpsons* Expert."

The tribute to Alice Schafer that Anne Leggett, Bhama Srinivasan, Erica Voolich, and I coordinated for the January–February 2010 issue of the *Newsletter* was revised and shortened for the *Notices* of the AMS, where it appeared in October 2010.

Expanding participation in AWM

Starting in January 2009, the resurrected AWM Committee on Committees has met twice a year to propose

names of potential committee members. This has expanded the pool of people involved in AWM, and as the thank-you list below attests, now more than ever, AWM has a wonderfully large, diverse group of volunteers. We have worked hard to standardize all committee appointments and put them on a regular schedule. In September 2009, the AWM Executive Committee, in a desire to further the openness of AWM operations, approved making the names of all committee members public.

The 2004 AWM Strategic Plan called for investigating the feasibility of creating an Advisory Committee (Board). To that end, I invited all past presidents of AWM to participate in a task force. Five past presidents volunteered to serve, and together we recommended to the Executive Committee that an AWM Advisory Board be formed. The board will be a multi-disciplinary group consisting of individuals in mathematics and related disciplines with distinguished careers in academia, industry, and government. It will increase the potential impact and visibility of AWM through the insights and experience of its members but will not set policy. The EC at its May 2010 meeting approved having an Advisory Board, and invitations to potential board members are being extended.

The AWM Long-Range Planning Committee began functioning once again in 2009 after a hiatus of several years. It tackled plans for the 40th anniversary and began moving forward with discussions of new initiatives for the next 40 years. In 2003, AWM went through an intensive self-assessment that resulted in a strategic plan for the period 2004–07. That plan, which recommended expanding the Executive Committee from five to eight Members-at-Large, led to the creation of four portfolios chaired by EC members (Fundraising and Development, Meetings and Programs, Membership and Community Relations, and Policy and Advocacy). The portfolios have held bimonthly calls, initiated various projects, and made many recommendations to the EC for implementation. This method of organization has been operating well and accomplishing much. Each year since 2007, the strategic plan has been updated, but in the coming year our new president Jill Pipher and I, as past president, plan to work with the Long-Range Planning Committee and the EC on developing a new plan that articulates overarching goals and a vision of AWM for the future. Suggestions from our members are welcome!

Increasing AWM's visibility and activity inside and outside the mathematical community

AWM's participation this October in the USA Science and Engineering Festival on the National Mall in Washington, D.C., was a huge success thanks to the enormous efforts of Executive Committee member Irina Mitrea, her co-organizers Tai Melcher and Katharine Ott, 12 student volunteers (Aurora Bristor, Brianna Cash, David Evans, Nora Evans, Jenny Harper, Anne Jorstad, Eric Kamta, Felisha Lawrence, Mariama Orange, Talia Ringer, Poorani Subramanian, and Victoria Taroudaki) who gave up their Saturday and Sunday free time for the cause. More than 1700 visitors, from enthusiastic young grade school students to grandparents and NSF program officers, stopped by the AWM booth and tried their hands at the cryptography puzzles, Jefferson ciphers, and mirror writing activities. The AWM festival materials can be found on our website … and pictures and an article follow later in this *Newsletter*. To get a sense of some of the activities at the festival, you might try to decode the following:

HDT NYLD MYVT H ZTHSS ZOHRF ILNPUUPUN PU 1971 DOLU DVTLU DLYL "PUCPZPISL" AV 1991 DOLU, HJJVYKPUN AV JHYVS DYYK, DVTLU DLYL "LCLYFDOLYL KLUZL." — Lenore Blum, A Brief History of the Association for Women in Mathematics: the Presidents' Perspectives, *Notices Amer. Math. Soc.* **38** (1991), 738-754,

or perhaps

LZW BGMJFWQ AK LZW JWOSJV. — A quotation from Confucius.

Konstantina Trivisa, Professor and Director of the Applied Mathematics & Statistics and Scientific Computation (AMSC) Program at the University of Maryland, did a terrific job as AWM's Nifty Fifty Speaker. She notes that the AMSC Program, which works to integrate mathematics into fields of scientific investigation, is "the largest interdisciplinary program in the country. It consists of more than 140 faculty within 27 participating research units." As part of the festival activities, the Nifty Fifty group visited middle schools and high schools in the Washington area to speak about their work and careers in STEM fields. She describes her journey in these words, "As a person who was born next to the sea (in Greece), I love water and it is not a surprise that my research focuses on 'Wave Motion and Fluids.' If I had not realized my love for mathematics early on in childhood, I may not have stayed at school." What a Greek tragedy that would have been!

AWM Executive Director Maeve McCarthy worked with the Meetings and Programs Portfolio and with MAA Associate Executive Director Michael Pearson to negotiate a new Memo of Understanding between AWM and MAA for activities at MathFest. Signed by Michael and me in D.C. in early December 2009, the memo ensures that the Falconer Lecture will continue to take place at MathFest and that it will be preceded by a coffee in the lecturer's honor. At the last two MAA MathFests, AWM has sponsored the popular

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panels "Family Matters" and "Going it Alone: The Single Mathematician." AWM hopes to continue these panels as a way of increasing awareness of some of the problems women (and men, too) face in studying and pursuing careers in mathematics.

Gioia De Cari's autobiographical solo show, *Truth Values: One Girl's Romp Through M.I.T.'s Male Math Maze*, about her own experiences as a graduate student in mathematics had three sold-out performances during the 2010 joint meetings in San Francisco, drawing rave reviews. AWM organized discussions after the Thursday and Friday performances, and MSRI, which had sponsored the performances, donated a generous portion of the proceeds to AWM (many thanks once again to MSRI!).

At the joint meetings in January and at the SIAM meeting in summer, AWM continued its successful workshops for early-career mathematicians. AWM's new Workshop Director Cammey Cole Manning began her duties with the SIAM workshop this past July, although she was already well acquainted with the workshops as both a participant and workshop committee member. A just-completed longitudinal study of workshop participants from 2007–2010, conducted by former AWM Executive Director Jenny Quinn, showed that participants were very positive about the workshops and the opportunity they afforded them to present their research and meet senior women mathematicians. All said that they would recommend future AWM workshops to friends and colleagues.

In October 2009, Math for America pledged to sponsor AWM's Essay Contest in 2010, 2011, and 2012. Support for this program in the previous two years had come from private donors. With Math for America's fabulous advertising, contest submissions increased tenfold from around 70 to almost 700. AWM sent out a call for readers, and true to the spirit of volunteerism that has been present in AWM from its earliest days, we received the help we needed. Our thanks to those who responded to our plea!

After attending the AMS Committee on Meetings and Conferences in March 2009, where similar initiatives were debated, I asked the Meetings and Programs Portfolio to codify what AWM had been doing rather informally by drawing up guidelines for holding a meeting "In Cooperation with AWM." The how-to-do-this description is now on our website…. AWM has already held several meetings in cooperation with other societies: the "Emerging Topics in Dynamical Systems and Partial Differential Equations" meeting co-hosted by SIAM, Real Sociedad Española de Matemáticas, Societat Catalana de Matemátiques, and Sociedad Española de Matemática Aplicada in Barcelona, Spain, May 31 – June 4, 2010, and the COACh Workshop, "Professional Skills Training for Female Graduate Students and Postdocs" at the SIAM annual meeting in July 2010. The upcoming "Women in Mathematics Symposium" at the Institute for Pure and Applied Mathematics (IPAM) at UCLA, February 24–25, 2011, will also be held in cooperation with AWM.

In April 2009, AWM co-sponsored the "Career Options Workshop for Women" at the Institute for Mathematics and its Applications in Minneapolis. And AWM cooperated in sponsoring a joint mentoring-networking event with the Korean Women in Mathematical Sciences at the AMS-KMS joint meeting in December 2009. The International Congress of Women Mathematicians (ICWM), organized by the European Women in Mathematics (EWM) with support from AWM and the European Mathematical Society, took place two days prior to the International Congress of Mathematicians at Hyderabad. We were delighted

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**.

that former AWM president Carol Wood could represent AWM at this event and describe our organization and its many activities to mathematicians from around the world.

In early October, I was invited, along with representatives from AMS, MAA, SIAM, and ASA (American Statistical Association), to an NSF retreat. We were asked to give 30-minute presentations to NSF directors and program officers on the landscape of the profession as seen through the eyes of our societies. Margaret Bayer, Bettye Anne Case, Alexander Kurganov, Matthew Miller, and Marie Vitulli helped me compile statistics from six different graduate programs on the number of female full-time, first-year graduate students in mathematics, the number of women undergraduate mathematics majors, and the percentage of women in tenured, tenure-track, and postdoctoral positions. Our study was far from comprehensive or scientific, as it was assembled on very short notice; instead, it was meant to give a snapshot of both the declining number of women entering graduate studies in mathematics and the attrition everywhere along the pipeline, two critical concerns that I raised in my presentation. In their article "AWM in the 1990s: A Recent History of the Association for Women in Mathematics," (*Notices Amer. Math. Soc.* **46** (1999), 27-38), Jean Taylor and Sylvia Wiegand, after citing a number of gains since the time of AWM's founding in 1971, asked "Is AWM still needed?" Now over a decade later, we give the same response they gave, YES! Because the problems are deeply rooted and persistent, continued efforts to encourage and mentor are still very much needed.

The new AWM Humphreys Prize, which came into existence last year thanks to the generosity of AWM past president Carol Wood and colleagues, friends, and former students of Gweneth Humphreys at Randolph Macon College, will be awarded for the first time at the upcoming Joint Mathematics Meetings. This prize honors a teacher (woman or man) who has encouraged female undergraduate students to study mathematics at the graduate level and/or to have careers in mathematics. Mentoring is time-consuming and often undervalued, but it is one of the most important things we do. For that reason, AWM is happy to acknowledge the role mentoring plays through this new prize.

The Association for Women in Science's three-year, NSF-funded project, "Advancing Ways of Awarding Recognition in Disciplinary Societies" (AWARDS), to establish a framework for more equitable recognition of women and members of other underrepresented groups in scientific communities, began in earnest with a workshop in Washington, D.C., this past June. The seven project-partner societies in the AWARDS study have a combined membership of 329,000 and sponsor nearly 400 awards. Among them are AMS, MAA, SIAM, and ASA. The inclusion of MAA and SIAM was catalyzed by AWM, which agreed to collaborate further in this project by recruiting and working with AWARDS task force members. Charles Epstein, Frank Morgan and I represented the AMS at the workshop, and Cathy Kessel and Maura Mast served as AWM representatives. All the participating societies are in the process of reviewing and revising their prize procedures by gathering data, clarifying prize criteria and selection processes, and establishing good practices among their award committees.

On the AMS side, the recommendations that Epstein, Morgan, and I developed with input from Maura Mast were presented to the AMS Committee on the Profession (CoProf) at its October meeting. They were greeted with enthusiasm and with a general desire to see them enacted. An AMS committee consisting of Robert Daverman (AMS Secretary), Ron Donagi, Bryna Kra, and Michelle Wachs, all of whom are members of CoProf, will begin to implement the recommendations by working on the web pages for the various AMS prizes and on web-based submission forms. It also will make recommendations to CoProf about the nature of possible oversight and canvassing committees. Our other recommendations concerning the establishment of more AMS prizes for early-career mathematicians will take more time (and money) to get off the ground.

AWM's prizes, while not suffering from a shortage of female winners, still could benefit from review and revision of their criteria and selection procedures. In the last few months, Bettye Anne Case, AWM's dedicated Meetings Coordinator since 1983, has begun this project with the assistance of the Meetings and Programs Portfolio.

Since 1975, AWM has been an active member of the Conference Board of Mathematical Sciences (CBMS), an umbrella organization of seventeen professional societies. CBMS meetings that I attended in December 2009 and May 2010 have focused on the cooperative effort of states to develop and adopt a strong set of common core standards for K–12 mathematics. Each October for the last three years, CBMS has sponsored a forum on various issues related to the standards. As a result of that effort, on January 18, 2010, a draft of "The Common Core K–12 Mathematics Standards" was circulated to member societies for feedback. This document provides grade-level standards for mathematics in grades K–8 and high-school standards organized under the headings used in the previously released document *College and Career Readiness Standards in Mathematics*. Pao-sheng Hsu, Cathy Kessel, and Erica Voolich, all of whom had represented AWM at the October 2009 CBMS National Forum on Content and Assessment of School Mathematics, along with fellow AWM Education Committee member Karen Marrongelle, reviewed this nearly 60 page document and amazingly responded with 16 pages of comments by the target deadline of January 25!

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On June 2, 2010, the National Governors Association Center for Best Practices and the Council of Chief State School Officers released the Common Core State Standards for Mathematics and for English Language Arts. The development of these standards was led by governors and chief state school officers in 48 states, 2 U.S. territories and the District of Columbia. As of early November, the standards had been adopted by 2/3 of the states. CBMS societies were involved right from the beginning. The October 2010 CBMS Forum, "Content-Based Professional Development for Teachers of Mathematics," focused on another critical aspect of the process, the mathematical education of teachers. Again, Pao-sheng, Cathy, and Erica participated, as did the newest member of the AWM Education Committee, Susan Schwartz Wildstrom, who is on the faculty at Walt Whitman High School in Bethesda, Maryland, and on the Board of Directors of The Art of Problem Solving Foundation, an organization devoted to promoting problem-solving education for middle and high school students. Susan has been a member of MAA's committees on mathematics competitions and has served on its Board of Governors.

AWM's Mentor Network was established in 2001 by Rachel Kuske following the IMA Conference, "Connecting Women in Mathematical Sciences to Industry." The Network matches mentors, both women and men, with girls and women who are interested in studying or pursuing careers in mathematics. Those requesting a mentor are primarily recent Ph.D. recipients, graduate students, undergraduates, high school, middle school and grade school students, and teachers. From 2001 to 2008, all mentor pairs were matched by Kuske, who was assisted by a graduate student at the University of British Columbia, where Rachel is a professor and currently serves as the head of the Mathematics Department. In late 2008, the structure of the program was changed to help distribute the workload more evenly, and now each Mentor Network Committee member assumes the role of coordinating matchmaker for two months of the year. After a decade of wonderful collaboration between AWM and the University of British Columbia on the Network, Rachel asked that the torch be passed. We are in the process of moving the "headquarters" to Miami University of Ohio, where it will be supervised by committee chair Anna Ghazaryan. In 2010, 121 new volunteers offered to be mentors (many thanks to all!), and a total of 47 new matches were made.

AWM's Teacher Partnership evolved from two ideas: AWM past president Suzanne Lenhart wanted to extend the Mentor Network concept to K–12 teachers, and Pao-sheng Hsu wanted to connect mathematicians with teachers of grades K–12. Erica Voolich, a teacher at Solomon Schechter Day School in Newton, MA, and a member of the AWM Education Committee, joined the planning group, and together the three designed the program, which began in 2006 on the premise that a partnership between individuals rather than a mentoring relationship would be more constructive. Almost immediately, requests for partners poured in. By April 2008, there had been 113 from all over North America, Europe, Africa, and Asia, and over 60 pairings had been made. Suzanne, Pao, and Erica continue to run this highly successful program. In November 2008, they conducted their own formative evaluation of it, and in August 2010, they enlisted the help of Rose Asera, who had served as an evaluator and researcher for Uri Treisman's Berkeley Professional Development Program, to look at the AWM Teacher Partnership from the "outside." As a result of conversations with Rose and ideas the organizers have generated, some changes are in store for the program. AWM is very grateful to Suzanne, Pao, and Erica for their dedicated work on the partnership program the last four years and to Rose for volunteering to take a look at the program and give us her thoughts.

AWM's 40th anniversary will soon be in full swing with loads of activities planned at the Joint Mathematics Meetings in New Orleans in January 2011; an AWM 40th Anniversary Embedded Meeting at the 7th International Congress of Industrial and Applied Mathematics (ICIAM 2011) in Vancouver in July 2011; and a two-day conference, "40 Years and Counting: AWM's Celebration of Women in Mathematics," at Brown University in September 2011. Details will be posted throughout 2011 in the *Newsletter* and on the AWM website. Please join us for one or all of the events and help us celebrate AWM!

Two years ago, I wrote "what a truly unique organization AWM is. With just a few staff members (all employed by AWM only part time), AWM thrives because of its volunteers." I am indeed grateful for all that our volunteers have done. When I asked someone to serve on a committee, rarely was I turned down, and even then, it was always for a very good reason. But while our volunteers are absolutely necessary, they are not sufficient. And I take this opportunity to extend my deep appreciation for the help and hard work of our staff: Executive Director Maeve McCarthy, Managing Director Jennifer Lewis, Workshop Director Cammey Cole Manning, Membership and Advertising Coordinator Matthew Hundley, Graphics Designer Cindy Dyer, Web Assistant Gerhard Hartl, and Student Assistants Glenna Buford and Meredith Stevenson. Finally, special thanks go to the Executive Committee members who have accompanied me on this journey: Sylvia Bozeman, Bettye Anne Case, Holly Gaff, Sarah Greenwald, Ruth Haas, Rebecca Herb, Cathy Kessel, Trachette Jackson, Anne Leggett, Dawn Lott, Maura Mast, Irina Mitrea, Jill Pipher, Ami Radunskaya, Rebecca Segal, Alice Silverberg, Abby Thompson, Lisa

Traynor, Marie Vitulli, and Betsy Yanik. And best wishes to Jill as she embarks on hers!

It is good to have an end to journey toward; but it is the journey that matters in the end. — Ursula K. LeGuin

Georgia Benkart
Madison, WI
November 24, 2010

AWM Workshop at the 2023 SIAM Conference of Optimization

Application deadline for graduate students: October 1, 2022

For many years, the Association for Women in Mathematics has held a series of workshops in conjunction with major mathematics meetings. The AWM Workshops serve as follow-up workshops to Research Collaboration Conferences for Women (RCCW), featuring both junior and senior speakers from one of the AWM Research Networks. An AWM Workshop is scheduled to be held in conjunction with the 2023 SIAM Meeting on Optimization (OP23) co-located with Applied & Computational Discrete Algorithms (ACDA23), Wednesday, May 31 – Saturday, June 3, 2023 in Seattle, Washington

FORMAT: The workshop will consist of two research minisymposia focused on **Inverse Problems** organized by Chrysoula Tsogka and Noemi Petra, a **Poster Session** and an **informational minisymposium** directed at starting a career. The Special Session will feature selected junior and senior mathematicians from the Research Network Women in Inverse Problems (WiP). This workshop follows the RCCW that was hosted by the Banff International Research Station in December of 2021.

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

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

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

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

Applications must be completed electronically by **October 1, 2022**. See https://awm-math.org/meetings/awm-siam/ for details.

MENTORS: We also seek volunteers to act as mentors for graduate students as part of the workshop. If you are interested in volunteering, please contact the AWM office at awm@awm-math.org by **April 15, 2023**.

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.

2022 Awards and Prizes

Congratulations to those cited below for their awards from organizations other than AWM! We include here awards to women (and to a couple of departments) whose honors have not already been included in earlier issues of this newsletter. See https://jointmathematicsmeetings.org/meetings/national/jmm2022/2268_prizes-all, where you will find a link to a YouTube showing pix of all the winners, plus a link to the pdf of the Prize Booklet (prizebooklet_2022_MASTER_EBOOK.pdf) in which the information below appears. The extracts are reprinted in the order in which they appear in the booklet. For descriptions of the prizes and further information, visit the web.

Frank and Brennie Morgan Prize (AMS-MAA-SIAM)

Sophie Kriz, University of Michigan (Honorable Mention)

Sophie Kriz is recognized with an Honorable Mention for the 2022 Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student. She has written seven solo research papers and co-authored a textbook titled *Introduction to Algebraic Geometry*. The papers have appeared in journals such as *Algebraic and Geometric Topology*, *Communications in Algebra*, and the *Pacific Journal of Mathematics*. Kriz's contributions show extraordinary breadth and fluency with sophisticated concepts, with results in several areas of mathematics, including algebraic topology, category theory, representation theory, and other areas. One of her letter-writers notes that she "is essentially at the level of a post-doc in terms of mathematical ability, and has produced a body of work that would be the envy of most post-docs." Kriz is currently a sophomore undergraduate student at the University of Michigan, Ann Arbor.

Biographical Note

Sophie Kriz began wondering about the mathematics of a Rubik's cube and learned the basics of group theory after seeing a robot solve the puzzle at the MIT Museum at age 5. Soon after, she began reading about other concepts of abstract algebra. The challenge of finding a suitable text eventually led Kriz to a project of publishing a widely accessible textbook on that subject. She was always fascinated by the story of Emmy Noether. After graduating from Community High School in Ann Arbor, she became a full-time student at Michigan at the age of 14. Kriz has been taking advanced graduate classes in topology, geometry, and other subjects. In addition to mathematics, she is an ardent piano player. Recently, Kriz has been adapting lesser-known Bach organ pieces for the piano and performing them.

Response from Sophie Kriz

It is a great privilege to receive an Honorable Mention for the 2022 Morgan Prize. I want to thank the Morgan family, the AMS, MAA, and SIAM for establishing this award to recognize and promote undergraduate research in mathematics. I want to thank Stephen DeBacker for his advice and for making it possible for me to study at the University of Michigan at a young age. I want to thank M. C. Kang for having the patience to correspond with me, a kid and a complete outsider to his subject, and for his important advice and guidance on what became my first published research project. I want to thank Peter May for introducing me to algebraic topology at large, and for encouraging me to study the subject systematically. I would especially like to thank Andrew Snowden for introducing me to representation stability and modular representation theory and for showing me interesting and highly challenging problems. I am incredibly grateful to him and Jennifer Wilson for running the TAPIRS and OTTERS seminars at the University of Michigan, which are so helpful to the community of young representation theorists there. Finally, I would very much like to thank my parents, who are both mathematicians, for their support and encouragement. Please rest assured that I know that you could not have ever expected what I would be asking of you and that responding to my questions has, at times, been anything but easy.

Joint Policy Board for Mathematics Communication Award (JPBM)

Talithia Williams, Harvey Mudd College

Talithia Williams is a statistician who is an innovative, award-winning college professor, a co-host of the PBS NOVA series *NOVA Wonders* and a speaker whose popular TED Talk, "Own Your Body's Data," extols the value of statistics in quantifying personal health information. She demystifies the mathematical process in amusing and insightful ways to excite students, parents, educators and the larger community about STEM education and its possibilities. In 2015, she won the Mathematical Association of America's Henry L. Alder Award for Distinguished Teaching by a Beginning College or University Mathematics Faculty Member, which honors faculty members whose teaching is effective, extraordinary, and extends its influence beyond the classroom.

A current MAA Pólya Lecturer, Williams developed a 24-part college-level lecture series, "Learning Statistics: Concepts and Applications in R," for The Great Courses, an online platform for lifelong learners. She is the author of *Power in Numbers: The Rebel Women of Mathematics*, a full-color book highlighting the influence of women in the mathematical sciences in the last two millennia [ed. note: see the November–December 2020 AWM *Newsletter* for our book review], and she has narrated several science documentary films including *Hindenburg: The New Evidence, Our Beautiful Planet, Secrets in our DNA*, and the upcoming joint BBC and NOVA 5-part series *Universe*.

Williams is currently an associate professor of mathematics at Harvey Mudd College. She is a proud graduate of Spelman College (BA in mathematics), Howard University (MS in mathematics), and Rice University (MA and PhD in statistics). Her research involves developing statistical models that emphasize the spatial and temporal structure of data and applying them to problems in the environment. She has worked at NASA, the National Security Agency, and the Jet Propulsion Laboratory and has partnered with the World Health Organization on research regarding cataract surgical rates in African countries. Faith and family round out a busy life that she shares with her husband and three amazing boys. Through her research and work in the community at large, she is helping change the collective cultural mindset, rebranding STEM as anything but dry, technical, or male-dominated but instead a logical, productive career path that is crucial to the future of the country.

Response from Talithia Williams

I recall the day my student, Elly, asked me if I'd consider giving a Claremont Colleges TEDx talk. I very politely declined. Not one to be easily dismayed, however, she kept asking and after about a week, I finally gave in. She later told me the topic: Storytelling. Storytelling?? STORYTELLING?!! What does math have to do with storytelling? I reached out to my colleague, Arthur Benjamin, to get his sage TED advice. Together, we came up with the idea of telling stories with data and "Show Me the Data" was birthed. This local TEDx talk would eventually go on to become a featured TED talk that has been viewed nearly 2 million times and has opened the door to so many other storytelling opportunities.

I am thrilled to be receiving the JPBM Communications Award for 2022. Sharing my enthusiasm for data science and mathematics with broad audiences has become one of the stories I truly enjoy telling. I'd like to thank the JPBM committee, all of my Harvey Mudd College colleagues, especially Arthur Benjamin, and my wonderful husband, Donald and sons, Josiah, Noah, and Micaiah. And my momma, Delores. I can't forget my momma!

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CALL FOR NOMINATIONS

Alice T. Schafer Mathematics Prize

The Executive Committee of the Association for Women in Mathematics calls for nominations for the Alice T. Schafer Mathematics Prize to be awarded to an undergraduate woman for excellence in mathematics. All members of the mathematical community are invited to submit nominations for the Prize. The nominees may be at any level in their undergraduate careers, but must be undergraduates as of October 1, 2022. They must either be a US citizen or have a school address in the US. The Prize will be awarded at the AWM Reception and Awards Presentation at the January 2023 Joint Mathematics Meetings in Boston, MA.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be at least one additional letter of support. Nominations of members of underrepresented minorities are especially encouraged. The letter of nomination should include, but is not limited to, an evaluation of the nominee on the following criteria: quality of performance in advanced mathematics courses and special programs, demonstration of real interest in mathematics, ability for independent work in mathematics, and performance in mathematical competitions at the local or national level, if any. With the letter of nomination, please include a copy of transcripts and indicate undergraduate level. Any additional supporting materials (e.g., reports from summer work using math, copies of talks, recommendation letters from professors, colleagues, etc.) should be enclosed with the nomination. All nomination material is to be submitted as ONE PDF file via MathPrograms.Org with a copy of transcripts included at the end of the file. The submission link will be available 45 days prior to the deadline. Nominations must be received by **October 1, 2022**. If you have questions, phone 401-455-4042, email awm@awm-math.org, or visit https://awm-math.org/awards/schafer-prize-for-undergraduates/.

Clarence F. Stephens/Abdulalim A. Shabazz Teaching Award (NAM)

The Board of Directors of the National Association of Mathematicians (NAM) has established a prize in honor of Clarence Stephens and of Abdulalim Shabazz to recognize outstanding mentorship activities.

This prize will be awarded annually to a mathematics educator who has significantly contributed to the development of mathematical talent in underrepresented undergraduate students and encouraged underrepresented undergraduate students to pursue mathematical careers and/or the study of mathematics at the graduate level, with preference given to faculty from Historically Black Colleges and Universities (HBCUs). The award is open to all in the mathematical profession. Nominees must be living at the time of their nomination.

Torina D. Lewis, AMS

"The way that [Dr. Lewis] used mathematics as a vessel to make a memorable impact on students' lives requires skill and empathetic understanding." — Colleagues from Clark Atlanta University

The National Association of Mathematicians is proud to present the 2022 Clarence F. Stephens/Abdulalim A. Shabazz Teaching Award to Dr. Torina D. Lewis, who was a mathematics professor at Clark Atlanta University (CAU) from 2013 to 2020 and is currently the Associate Executive Director for Meetings and Professional Services at the American Mathematical Society. Lewis earned a PhD in mathematics from The University of Mississippi in 2010, and her mathematical research interests include generalizing circuit sizes in bicircular matroids and the construction, geometrical modeling, and infusion of periodic polygon functions. Lewis has also conducted educational research on the implementation of adaptive learning techniques.

Lewis is recognized for stellar contributions to the teaching and mentoring of undergraduate students from historically excluded populations at Clark Atlanta University—a private, historically Black university—throughout her tenure there as an assistant professor, associate professor, and chairperson of the Department of Mathematical Sciences. Lewis was cited by her colleagues as the driving force behind a complete culture shift in the department, both for students and fellow faculty. Around campus, Lewis was well-known for engaging students during her active, "overflowing" office hours and encouraging students of all abilities to enthusiastically participate in mathematical inquiry. During her tenure at CAU, Lewis was awarded two of the University's most distinguished teaching awards, the Aldridge-McMillan Award for Excellence in Teaching and the Vulcan Teaching Excellence Award, in recognition for being a dedicated educator and passionate advocate for students.

In addition to exemplary teaching and mentoring, Lewis served as a principal investigator, co-principal investigator, or collaborator on several research and education-focused grant initiatives totaling over $2.5 million during her tenure

CALL FOR NOMINATIONS

The Association for Women in Mathematics Dissertation Prize

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

To be eligible for the award graduate students must have defended their dissertation within the last two years (October 1, 2020 to September 30, 2022). They must either be a US citizen or have a school address in the US. The Prizes will be presented at the AWM Reception and Awards Presentation at the Joint Mathematics Meetings in Seattle, WA.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted. Nominations of members of underrepresented minorities are especially encouraged. The nomination should include: 1) a one to three page letter of nomination highlighting the exceptional mathematical research presented in the dissertation, 2) a copy of the dissertation and/or a URL address where it can be accessed, 3) two letters supporting the nomination and 4) a curriculum vitae of the candidate not to exceed three pages. Nomination materials should be submitted online at MathPrograms.org. The submission link will be available 45 days prior to the nomination deadline. Nominations must be received by **October 1, 2022**. If you have questions, phone 401-455-4042, email awm@awm-math.org, or visit awm-math.org/awards/awm-dissertation-prize/ for more information.

at CAU. Her leadership on these projects fostered interdisciplinary faculty collaborations across the University, designed to increase research opportunities and to improve student learning outcomes through course redesign and assessment, as well as implementation of adaptive learning courseware, student enhancement training, supplemental instruction, and faculty development. Beyond her classroom activities and grant-funded projects, Lewis also devoted extensive time to encouraging student growth outside the classroom through her service as the faculty advisor for the national Pi Mu Epsilon and Phi Kappa Phi honor societies and the Mathematical Society, the student mathematics organization at CAU. Lewis' colleagues attribute to her mentorship a marked increase in student engagement in co-curricular activities such as academic year research projects, internships, post-undergraduate opportunities, campus leadership positions, and presentations at conferences and symposia. Lewis' success as an educator and mentor are demonstrated by the large numbers of undergraduate students she advised in their first mathematics research experience, the awards received by her student advisees and research mentees, her success in "converting" students to mathematics majors after only a semester in her calculus courses, and the multitude of former students who have gone on to excel in graduate STEM programs or STEM-related careers.

Led by a commitment to creating environments where her students engage in purposeful learning and empowered thinking about mathematics and themselves, Lewis has used her seat at STEM tables to reorient and design them for a more equitable mathematics profession. The National Association of Mathematicians recognizes Torina D. Lewis for excellence in teaching and mentoring and for the tremendous impact she has had on the lives of countless math majors and non-majors alike.

Biographical Note

Torina D. Lewis is a native of New Orleans, Louisiana, who found refuge in the heart of the seventh ward, where it was uncommon to fall in love with mathematics. She earned a Doctor of Philosophy in Mathematics from the University of Mississippi, a Master of Science in Mathematics from Southern University and Agricultural and Mechanical College, and completed undergraduate studies at Southern University at New Orleans.

Lewis served as an energetic communicator of mathematics at Clark Atlanta University (CAU) from 2013 to 2020 because she believes in the mission and vital role bestowed on Historically Black Colleges and Universities (HBCUs) concerning the education of African American students who aspire to achieve above the minimalistic stigma placed on the group because of the amount of melanin produced by their skin. She dedicated her classroom and chose research endeavors that included opportunities to expand her students' intellectual capacity and confidence in preparation for advanced studies as well as career opportunities in the mathematical sciences that could change the trajectory of their lives.

Lewis currently serves as the Associate Executive Director for Meetings and Professional Services at the American Mathematical Society (AMS). She provides a succinct vision for supporting the profession's sustainability through scholarly opportunities designed to engage, connect, and advance the careers of members belonging to the mathematics community. Her local work at CAU and the priorities of AMS converge to birth widespread opportunities encouraging a more equitable profession with the potential of having a national impact on marginalized groups, mainstream mathematicians, and students alike. She lives by the words: if I can help one, my living will not be in vain.

Response from Torina D. Lewis

While I am honored and quite surprised to receive this award from an organization that I admire, respect, and above all trust, it is no coincidence that the committee chose me for such an honor. My entire life has been a testimony. Scared, intimidated, and often tired, I was called to serve as a voice to elevate, empower, and speak up for the community at Clark Atlanta University. Fielding wisdom from above, I gave students the audacity to believe, the guidance to achieve, and strengthened their minds to lead.

Without family, friends, teachers, professors, mentors, collaborators, antagonists, and most importantly, my students, the accomplishments in this citation are impossible. These giants afford me direction when I am lost, the will to keep going when I want to quit, words of affirmation when I need uplifting, and signs of gratitude when I need encouragement. Thanks for the multitude of experiences preparing me for my assignment.

Finally, I dedicate this award to the Black girls and boys worldwide who dare to dream of becoming a mathematician amid adversity, the student with the odds stacked against her, and the mathematician who can't seem to fit in with the status quo. Understand that life is a journey, and it is in the friction where one receives preparation for their divine purpose.

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David P. Robbins Prize (AMS)

Alin Bostan, Irina Kurkova, and Kilian Raschel

The David P. Robbins Prize is awarded to Alin Bostan, Irina Kurkova, and Kilian Raschel for their paper, "A human proof of Gessel's lattice path conjecture," published in *Transactions of the American Mathematical Society* in 2017.

This paper proves highly nontrivial enumeration results on a family of lattice paths known as Gessel walks. Like many of Robbins' works, these simple-to-describe walks have a surprisingly beautiful enumeration, but one which withstands standard combinatorial techniques. The proof makes an inspired use of experimentation to connect the problem with a remarkable identity involving elliptic functions. Unlike previous arguments, this novel proof method avoids any reference to large-scale computation.

A Gessel walk is a path contained in the nonnegative quadrant of the lattice Z^2 that consists of steps in the set {←, →, ↗, ↙}. Around 2000, Ira Gessel observed that the number of such walks of length $2n$ that return to the origin appeared to be given by the formula

$$a(n) := 16^n \frac{(5/6)_n (1/2)_n}{(2)_n (5/3)_n},$$

where $(x)_n := (x + 1) \cdots (x + n - 1)$ is the rising factorial. For $n = 0, 1, 2, 3$ there are $a(n) = 1, 2, 11, 85$ returning Gessel walks of length n; additional terms can be found in sequence A135404 (https://oeis.org/A135404) in *The On-line Encyclopedia of Integer Sequences*.

One can consider walks with steps restricted to other subsets of {←, →, ↑, ↓, ↗, ↘, ↙, ↖}. The subset {←, →, ↗, ↙} that appears in Gessel's conjecture is notable in that it is the only one that cannot be treated in a uniform way using methods developed by Bousquet-Mélou and Mishna.

Gessel's conjectured formula was confirmed by Kauers, Koutschan, and Zeilberger in 2008 using a lengthy computer-aided proof that relies on the verification of a linear recurrence of order 32 that spans some 250 pages in printed form. At the conclusion of the paper describing this verification, the authors write ". . . we believe it is very possible that a short human proof does not exist."

Bostan, Kurkova, and Raschel have answered this challenge by finding such a proof. They achieve this in a distinctly non-elementary way, using methods from complex analysis to establish a series of identities that allow them to relate a hypergeometric function generalizing Gessel's formula to a weighted sum of transcendental functions that arise in the theory of elliptic functions.

Let $q(i , j; n)$ count Gessel walks of length n that end at (i, j). The integers $q(i , j; n)$ are the coefficients of the complete generating function

$$Q(x, y; z) := \sum_{i,j,n\geq 0} q(i, j; n) x^i y^j z^n.$$

As observed by Gessel, his conjecture is equivalent to

$$Q(0, 0; z) = \frac{1}{2z^2}\left({}_2F_1\left(\left[-\frac{1}{2}, -\frac{1}{6}\right], \left[\frac{2}{3}\right], 16z^2\right) - 1\right),$$

where

$${}_2F_1([a, b], [c], z) := \sum_{n=0}^{\infty} \frac{(a)_n (b)_n}{(c)_n} \frac{z^n}{n!}$$

is the Gaussian hypergeometric function.

Bostan, Kurkova, and Raschel are able to prove Gessel's conjecture by establishing a remarkable formula relating the algebraic hypergeometric function ${}_2F_1([-1/2, -1/6], [2/3], 16z^2)$ to a sum of values of an associated Weierstrass zeta function. The heart of their proof lies in establishing this formula via four identities whose verification, while not trivial, rests primarily on what are now classical results from complex analysis. The real difficulty lies in finding their formula and the identities they need to prove it, which required some experimentation and inspired guesswork that is very much in the spirit of David P. Robbins' work.

Irina Kurkova, Sorbonne University

Irina Kurkova grew up in the Soviet Union and earned her PhD at Moscow State University in 1998. Although specializing in probability, she mastered a broad spectrum of mathematics: Her thesis developed an analytic approach using extensively complex analysis as well as algebra and geometry to solve discrete probability problems. Kurkova moved to France in 2000 and now works at Sorbonne University (formerly Pierre and Marie Curie University). In the 2000s, she studied spin glass models in statistical physics. Later on, she returned to analytical methods in probability and expanded her research to combinatorial problems. She divides her time between research, teaching, and the supervision of students of the Master 2 Probability Program.

Response from Irina Kurkova

I am deeply honoured and delighted to have been selected for the 2022 Robbins Prize. At Moscow University, my first steps in mathematics were guided by Vadim Malyshev, to whom I am deeply grateful for transmitting to me a broad scientific culture and a burning passion for

research. Twenty-five years ago, he introduced me to the analytic approach of lattice paths and prompted me to develop it, which sowed the seeds of the awarded result.

I would also like to thank the French mathematical community, which welcomed me with great hospitality in 2000 and offered me excellent working conditions as well as complete freedom to choose my research subjects. I turned to combinatorics due to the encouragements of my colleague Philippe Bougerol.

The result of the awarded article was achieved by joining methods coming from very different domains of mathematics. Moreover, it's a truly common work, where all the authors brought their own mathematical skills and their personal contributions. I am very much indebted to my co-authors for their collaboration.

Last but not least, I would like to thank Ira Gessel for his challenging conjecture that was so simply formulated and yet so intriguing and so deep. It inspired many beautiful contributions in combinatorics.

Award for an Exemplary Program or Achievement in a Mathematics Department (AMS)

University of Missouri

The University of Missouri Mathematics Department's outreach program under the leadership of Professor Stephen Montgomery-Smith has been highly successful in serving at-risk and low-income children in Columbia, Missouri by partnering with the Grade A Plus Academic Support and Enrichment program. Graduate students are recruited as tutors, and community students seeking tutorial support also are recruited. This experience for the graduate student tutors not only provides valuable assistance to the at-risk community but also gives the tutors the positive benefits of responsible community membership. The at-risk students commit to at least two hours a week of tutoring and many of them pursue mathematics beyond the basic two course minimum. The graduate student tutors are given an award at the end of each year by the Mathematics Department for their service to the community.

Response from University of Missouri

Stephen Montgomery-Smith and Janice Dawson-Threat started their collaboration in 2015. Dawson-Threat is the founder and chief executive officer of Grade A Plus, which operates an academic support and enrichment program in Columbia to help younger children gain academic skills and self-confidence in their academic abilities. Montgomery-Smith is a professor of mathematics at the University of Missouri-Columbia and at the time was the director of graduate studies in the department.

The Grade A Plus program originally relied on undergraduate students who volunteered for service credit. As the children in the program entered middle and high

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CALL FOR NOMINATIONS

The 2023 Etta Zuber Falconer Lecture

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

The mathematicians who have given the Falconer lectures in the past are: Karen E. Smith, Suzanne M. Lenhart, Margaret H. Wright, Chuu-Lian Terng, Audrey Terras, Pat Shure, Annie Selden, Katharine P. Layton, Bozenna Pasik-Duncan, Fern Hunt, Trachette Jackson, Katherine St. John, Rebecca Goldin, Kate Okikiolu, Ami Radunskaya, Dawn Lott, Karen King, Pat Kenschaft, Marie Vitulli, Erica Walker, Izabella Laba, Talithia Williams, Pamela Gorkin, Tara Holm and Bonita Saunders. The 2022 lecturer will be Suzanne Weekes.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be at least one additional letter of support. Nominations for members of underrepresented minorities are especially encouraged. The letter of nomination should include an outline of the nominee's distinguished contributions to the mathematical sciences or mathematics education and address the nominee's capability of delivering an expository lecture. A curriculum vitae of the candidate not to exceed three pages is also required. Nominations are to be submitted as ONE PDF file via MathPrograms.Org. The submission link will be available 45 days prior to the deadline. Nominations must be submitted by **October 1, 2022** and will be held active for a total of two years (one year beyond the initial nominations). If you have questions, phone 401-455-4042, email awm@awm-math.org or visit https://awm-math.org/awards/falconer-lectures/ to learn more.

school and needed math support from more experienced tutors, Dawson-Threat approached Montgomery-Smith to collaborate with the graduate math program. Together, they launched Math-Up!, a program for tutoring 8th through 12th grade students experiencing inequities in access to academic support outside of school.

To provide math tutors, the University of Missouri Mathematics Department established a community service program. It quickly became apparent that math graduate students were extremely effective tutors. With their deep understanding of the subject, they were able to identify the weaknesses and gaps in the students' abilities and knowledge through one-on-one tutoring. Soon, failing students were obtaining B or C grades, and B or C students became A or A+ students. Many students who previously had no love for mathematics suddenly found themselves becoming honors students, in some cases taking Advanced Placement math classes.

Tutors and tutees also developed cultural competency. The graduate students, typically from privileged backgrounds, began to see that many people in the US do not have the same access to academic support. Conversely, students who had previously aspired simply to make money at part-time jobs now realized that math graduate students were regular people just like they were, and that perhaps they too might aspire to take math classes beyond high school.

Each year, at least one tutor serves as a team leader. In that role, they communicate with Dawson-Threat and the school system math leaders on any issues that arise. They also guide new tutors on working with diverse students with various viewpoints and fears about math.

One of the tutors noted, "Through the Math-Up! program I've had the opportunity to tutor middle and high school students. Despite the wide differences in topics that any two given students might be working on, my tutoring approach is basically the same: keep lecture-style presentations to a minimum, encourage conversations and questions, and periodically inject fun ideas from outside of the standard curriculum into our sessions. Working with Math-Up! gives me an opportunity to contribute something meaningful to the local community and develop connections outside of the math department."

The real heroes are the math graduate students. This award should be considered a win for the whole math graduate program and our community partner, Grade A Plus, Inc.

Award for Impact on the Teaching and Learning of Mathematics (AMS)

Deborah Hughes Hallett

Professor Deborah Hughes Hallett, currently Professor of Mathematics at the University of Arizona and Adjunct Professor at the Harvard Kennedy School of Government, has devoted her professional career to improving the teaching and learning of mathematics and promoting international cooperation between mathematicians. She has served on committees for the National Academy of Sciences and organized three international conferences on the teaching of mathematics. She is a fellow of the American Association for the Advancement of Science and the author or coauthor of seven books, which have been translated into several languages.

It is not an exaggeration to claim that Hughes Hallett has had a profound impact on the teaching and learning of collegiate mathematics. She was one of the foundational figures of the calculus reform movement in the early 1990s. With Harvard professor Andrew Gleason she formed the NSF- funded Calculus Consortium for Higher Education that resulted in a series of textbooks from algebra through multivariable calculus that have touched the lives of millions of students. These books helped instructors all over the world reimagine how mathematics should be taught and learned, placing greater emphasis on mathematical concepts and engaging students with problems that make connections between graphical, numerical, algebraic, and verbal representations.

Collaboration is a hallmark of Hughes Hallett's work. She has brought together a dynamic, diverse, and changing group of educators, including high school teachers, community college instructors, and faculty at 4-year colleges and research universities, to work together to provide the best possible learning experience for the largest number of students. She has also been a beloved mentor to hundreds of people including graduate students, high school teachers, postdocs, and faculty at all levels of mathematics. She has taught thousands of students and mentored generations of teaching assistants and postdocs at the University of Arizona and Harvard Kennedy School of Government. Her mentees describe her as "math educator, teacher, mentor, and professor with a magic touch."

Hughes Hallett has worked to improve the teaching and learning of mathematics and empower marginalized communities and women all over the world: Africa (Senegal, Niger), the Middle East (Lebanon, Oman, Qatar, Saudi Arabia, Turkey), and Asia (China, Brunei, Bangladesh, Guam). At the same time, her work is also cross-cutting in that she

has helped to reframe the mission of undergraduate mathematics education as central not to just the sciences, engineering, and business, but to every discipline in which human decisions, empowered by quantitative reasoning, have the potential to affect public life.

For her many sustainable and replicable contributions to mathematics and mathematics education, the AMS is delighted to award Professor Hughes Hallett the 2022 AMS Award for Impact on the Teaching and Learning of Mathematics.

Biographical Note

Deborah Hughes Hallett is regularly consulted on the design of curricula and pedagogy for undergraduate mathematics at the national and international level, and she is an author of several college-level mathematics texts. With Andrew M. Gleason at Harvard, she organized the Calculus Consortium, which brought together faculty from a wide variety of schools to work on undergraduate curricular issues. In 1998, 2002, and 2006, she co-chaired the International Conference on the Teaching of Mathematics, attended by several hundred faculty from about 50 countries. She has designed courses in Brunei, Colombia, and Niger. Hughes Hallett was awarded the Louise Hay prize and elected a fellow of the American Association for the Advancement of Science for contributions to mathematics education. She has also received prizes from Harvard, the University of Arizona, and the Mathematical Association of America.

Response from Deborah Hughes Hallett

Mathematics finds its way everywhere and into everything. It is an inspiration to me to see the excitement in students' eyes as they see mathematics illuminating something they are passionate about—racial justice, economic inequality, partisan redistricting, climate change, corruption, spread of disease, sports, astronomy, medical science, and language. There are still too many students who believe that mathematics is only useful "later"—a time that never comes. Wanting to challenge this, I taught a linear algebra course in which I decided all the discussions of applications should be written by people in the corresponding field, not mathematics. This quest took me to libraries I hadn't known existed and vividly demonstrated that mathematics is everywhere—law, archaeology, anthropology, demography, economics, business—ready for us to adapt for students. More recently, COVID-19 and climate change have provided data and contexts crying out for mathematics. My inspiration is to watch students find the courage to spread their mathematical wings and fly.

Who inspired me? Andy Gleason listened to everything and directed me not at all; Dan Flath has a breathtaking range of experience and equal patience; Bill McCallum sees the flaw in any argument, strengthening all of them; my Calculus Consortium colleagues invent ever better ways to engage students. Most of all, I have been inspired by my students, from the one who said "Deb, never do that again" to the author of the recent *Guardian* article "No one is born 'bad at maths' " to the one who said an SIR model of COVID-19 made the pandemic much less scary.

Mathematics Programs that Make a Difference Award (AMS)

California State University at Fullerton

The Department of Mathematics at California State University at Fullerton (CSUF) will receive the 2022 AMS Mathematics Programs that Make a Difference Award. The department is recognized for its excellent record of mentoring and graduating students from underrepresented groups.

Response from California State University at Fullerton

At the heart of Cal State Fullerton's Mission and Goals lies a central idea that we aspire to combine the best qualities of teaching and research universities, where actively engaged students, faculty and staff work in close collaboration to expand knowledge. Subsequently, a central theme in CSUF's philosophy is to enhance scholarly and creative activity. This underlying premise is carefully materialized by a community of mathematicians serving their profession and their scholarly community. As such, the Department of Mathematics has directed significant efforts to developing a student-faculty research culture, and thus accelerating the path towards preparing cohorts of new scholars.

This is "a program that has undeniably shaped my aspirations and continually pushed me to grow as a scientist," said Isabel Serrano, presently a PhD candidate in computational biology at the University of California, Berkeley. "As an alum, I can attest to the vital impact this department has had in diversifying the mathematical and scientific communities."

Claudia Gutierrez, a CSUF alum now teaching mathematics at Moorpark College, wrote: "In addition to the impact that my teachers made in my math journey, the CSU Fullerton math program also had programs and student clubs such as SMART Girls Club, Math Club, Math Tutoring Center, and Supplemental Instruction, which all went

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above and beyond to support me as a student of mathematics, as a teacher of mathematics, and as a woman in mathematics. The CSU Fullerton math program truly makes a difference, and I am honored to be an example of such difference."

Describing the campus's academic culture, Dean of Natural Sciences and Mathematics Marie Johnson noted, "We meet our students where they are and take them where they want to go. We specifically pay attention to students who have never thought of themselves as capable of getting involved with higher-level mathematics. That turns into an amazing journey in a very diverse academic setting, serving the needs of a vibrant community of learners."

Between 2008 and 2020, out of 628 students who completed a degree from the CSUF programs in pure mathematics, applied mathematics, probability and statistics, and teaching mathematics, 198 were underrepresented minorities, 300 (48%) were women, and 327 (52%) were eligible to receive Pell Grants. In the same span of time, 340 first-generation students entered the CSUF program in mathematics, 192 (31%) of whom were Hispanic. In the last decade a large array of papers co-authored by students and faculty in the CSUF program appeared in journals such as *Proceedings of the AMS*, *Taiwanese Journal of Mathematics*, *Houston Journal of Mathematics*, *Notices of the AMS*, and *Japanese Journal of Mathematics*.

Another CSUF alum, Lindsay Lewis, who now teaches mathematics at Golden West College, wrote, "It is an understatement to say that the opportunities at CSUF changed my life. Without the talented faculty and variety of programs accessible in the CSUF Mathematics Department, I truly do not know where I would be today. I am able to inspire other females and previously uninterested students to explore the STEM fields, and I contribute to my community daily. Serving as teacher, a role model, and a mentor is one of the most important aspects of my life, and I am grateful to the CSUF Mathematics Department for its extensive role in my development."

One of the important components of the Department of Mathematics' efforts is the Center for Computational and Applied Mathematics (CCAM), which serves to encourage and facilitate research, education, and outreach in computational mathematics and science through interdisciplinary collaborations of a diverse group of faculty, students, and external partners. Laura Smith Chowdhury, associate professor of mathematics and associate director of CCAM, wrote, "Our department's focus on students is evident in the plethora of opportunities available for students, including research opportunities with faculty, industrial consulting projects, teaching apprenticeships, problem-solving seminars, international research experiences abroad, and more. To be honored with this recognition is a testament to the faculty and students that have invested in these many efforts."

CSUF mathematics educator Armando M. Martinez-Cruz, a recipient of the Outstanding Latino/a Faculty in Higher Education Award from the American Association of Hispanics in Higher Education, describes the Cal State Fullerton spirit in the following terms: "We love mathematics, students and teaching mathematics. We aim to infuse this love and passion in our teaching graduates since teachers will touch every future professional: scientists, engineers, lawyers, governors, presidents. At Cal State Fullerton, we provide a comprehensive pathway to teaching mathematics. Our undergraduate and graduate teaching programs are nurturing programs that model best practices of teaching mathematics, a passion for mathematics and the belief that all students can learn mathematics."

AWM Workshop at the 2023 Joint Mathematics Meetings

Application deadline for graduate student poster session: August 15, 2022

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 Boston, MA, January 4–7, 2023.

FORMAT: The workshop will consist of a **Special Session** focused on **Women in Commutative Algebra** organized by Claudia Miller and Janet Striuli and a **Poster Session** for graduate students and recent PhDs. The Special Session will feature selected junior and senior mathematicians from the research network Women in Commutative Algebra (WiCA). This workshop follows the RCCW hosted by BIRS in October of 2019.

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

ELIGIBILITY: To be eligible for selection and funding, a graduate student must have made substantial progress towards their thesis. Women and non-binary mathematicians, including those 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, 2022**. See https://awm-math.org/meetings/awm-jmm/ for details.

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

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

Announcing the 2022 Karen EDGE Fellow

The EDGE Foundation is delighted to announce the 2022 Karen EDGE Fellow. The Karen EDGE Fellowship Program was established with a generous gift from Karen Uhlenbeck on the occasion of her 2019 Abel Prize. The Fellowships are designed to support and enhance the research programs and collaborations of mid-career mathematicians who are members of an underrepresented minority group. The 2022 Fellow was selected on the basis of her excellent research programs and her plans to use the funds for enhancing those programs through collaboration and travel. The 2022 Karen EDGE Fellow is Malena Español, Arizona State University.

Español earned her undergraduate degree from the University of Buenos Aires and her PhD in mathematics from Tufts University in 2009, under the direction of Misha E. Kilmer. She was a postdoctoral scholar at California Institute of Technology in Pasadena, CA, taught at the University of Akron, and subsequently joined the faculty of Arizona State University, where she has taught since 2019.

Español's research interests are in the areas of applied and computational mathematics. More specifically, she studies the development, analysis, and application of mathematical models and numerical methods for solving problems arising in science and engineering. Her research has been at the intersection of many different mathematical areas and is highly interdisciplinary, involving collaborations with engineers, chemists, and medical doctors. Her work has been focused on problems related to materials science, signal/image processing, and medical diagnostics. Some of her most recent projects involve the development of numerical methods for solving inverse problems in imaging.

The Karen EDGE Fellowship is an opportunity for Español to advance her research endeavors. It will connect her and her students with collaborators and experts in the area of inverse problems and imaging. Additionally, these funds will enable Español to travel to various conferences to present her work. Lastly, she will use the Fellowship to bring bilingual speakers to Phoenix for a new seminar series entitled Spanglish Math Seminar. We are very much looking forward to supporting Español as she continues to flourish!

Malena Español

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