



ASSOCIATION FOR
WOMEN IN MATHEMATICS

Newsletter

VOLUME 50, NO. 2 • MARCH-APRIL 2020

The purpose of the Association for Women in Mathematics is

- to encourage women and girls to study and to have active careers in the mathematical sciences, and
- to promote equal opportunity and the equal treatment of women and girls in the mathematical sciences.

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PRESIDENT'S REPORT

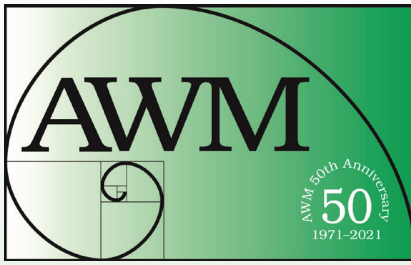
As usual, this, the March report, is being written just after the January Joint Mathematics Meetings. AWM activities started the day before the meetings with a highly informative and interactive workshop Moving Towards Action designed to help leaders in the community create more hospitable climates for women in departments, programs and across the profession. Kudos to AWM organizers Maeve McCarthy, Vrushali Bokil, Elizabeth Donovan, Ami Radunskaya and Karoline Pershell for designing the workshop and getting NSF funding for such a great day. One take-away that stays in my head as I interact with colleagues near and far in this hiring and grad student application season is that we should first focus on changing behavior (and hope of course that changing hearts and minds will follow, at least for the next generation).

Another highlight of the meeting for me was Birgit Speh's Noether Lecture. Speh spoke on "Branching Laws for Representations of Non Compact Orthogonal Groups" and described her exciting recent work in this beautiful and important area. She began her lecture talking about her own journey into mathematics, from childhood dreams of becoming a veterinarian to plans to go into physics, then being inspired by the work of Emmy Noether herself whose work she encountered in the context of her physics studies. All the other usual AWM events took place, including the graduate student workshop, poster session, and AWM reception (though at a new, but perhaps not improved time). More about most of these events and AWM awards and prizes later in the newsletter.

As most of you know the JMM is poised to change, with the MAA planning to significantly lessen its involvement at that meeting. In the coming year the AWM will discuss its presence at the JMM (yes, that will still be the name). It is likely that our activity there will not decrease. Indeed this year there were several special sessions that were designated "in cooperation" with the AWM and featured speakers from some of the AWM Research Networks. These included special sessions on Mathematical and Computational Research in Data Science, Women in Mathematical Biology, Women in Topology, Women in Symplectic and Contact Geometry, and Representation Theory Inspired by the Langlands Conjectures (this last associated with the Noether Lecture). What fun to have so many great choices! I expect sessions such as these to continue, and perhaps the numbers of these will even increase as the number of "Women in" research networks continues to grow.

February 1st is the transition date for AWM Executive Committee members. Following our election last fall we are welcoming new EC At-Large Members: Linda Chen, Carla Cotwright-Williams, Elena Fuchs, Michelle Snider, and Suzanne Weekes; our new Treasurer Mary Shepherd; and our new President-Elect Kathryn

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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*

Leonard. Thanks to everyone who volunteered to run for office; we appreciate that you stood ready to commit your time and energy to AWM too. Big thanks to those rotating off: EC At-Large Members Talia Fernós, Gail Letzter, Ivelisse Rubio, Talithia Williams, and Carol Woodward. Leaving us as well after their incredible efforts are Treasurer Ellen Kirkman who has served us so ably for a full eight years—probably developing new math just to understand the complexities of our books under different management systems; and the ever enthusiastic and tireless Past President Ami Radunskaya, who most certainly composed new music to motivate and celebrate our work.

Both our MD Steven Ferrucci and ED Karoline Pershell will be leaving us in the next few months. Each of them has been an incredible asset to our organization, and it is very hard for me to imagine how we will get by without even one of them! Our management company (the AMS) is in charge of finding the next Operations Manager (as the position will now be called). Steven will still be at AMS and available to help through the transition. We are underway in the search for the next Executive Director. Huge thank-yous to both Karoline and Steven. We wish you both well and look forward to seeing what great projects you take on next.

As always, I appreciate hearing what's on the minds of our members. I look forward to hearing your thoughts and working with our community.

Ruth Haas
January 24, 2020
Mānoa, HI



Ruth Haas

PRESIDENTS' REFLECTIONS

Column Editors: Janet Beery, University of Redlands; Francesca Bernardi, Florida State University; Kayla M. Bicol, University of Houston; Cathy Kessel, consultant

This is the eighth in a series of "Presidents' Reflections," articles by past presidents of the AWM that are intended to help us take stock of where we are and where we should be going, and to consider what we want the organization to be at its 50th anniversary. As always, the *AWM Newsletter* welcomes your suggestions and comments in letters to the editor.

Rhonda Hughes was the eighth president of AWM (1987–1989). In 1998, Hughes and Sylvia Bozeman founded Enhancing Diversity in Graduate Education: A Transition Program for Women in the Mathematical Sciences (EDGE), recognized by the AMS Mathematics Program that Makes a Difference

award in 2007 and the Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring in 2018. After many years as EDGE codirectors, Hughes and Bozeman now serve on the EDGE Foundation Board of Directors. For more about Hughes, see her entry at Wikipedia and her Humphreys Award citation.

My AWM Presidency

Rhonda Hughes

My AWM presidency, which began in 1987, was my introduction to the national mathematics community. This view of the community allowed me to observe the values of the prevailing mathematics culture in ways that would otherwise have been unavailable to me. It changed my professional life and gave me countless opportunities. I found heroes who inspired and sustained me. When I emerged on the other side, I had a fairly good idea of how I might find my way as a professional in this complicated community.

I was an early fan of AWM. I started graduate school in 1969 at my undergraduate alma mater, the University of Illinois at Chicago (then Chicago Circle). A couple of years later, when I first heard of this organization *for* women in mathematics, I was ecstatic. Inspired by the feminist rumblings coming from afar, we formed a group in the math department and began to have regular lunchtime meetings. Louise Hay was the faculty member who supported and encouraged us. Our early meetings drew large crowds, but some expressed concern that we would “make waves.” Louise asked, characteristically, “What’s wrong with that?” She was always a champion of women and the underdog. When she heard that a woman graduate student with children was given an inconvenient teaching schedule, she marched off to get it fixed. It made all the difference having a supportive, respected senior woman in the department. I hope I learned a bit from her about how to stand up for what is right.

My first position after finishing my PhD was at Tufts University. I was thrilled to be in Boston, an AWM epicenter, and to meet Alice Schafer, Bhama Srinivasan, coding theorist Vera Pless, and other luminaries. Nevertheless, I found the East Coast jarring after the openness of the Midwest where I had been born, raised, and educated. In 1979, my daughter Sarah was born, and in 1980, I moved to Bryn Mawr College. Philadelphia was a happy medium between Chicago and Boston, and I finally found my professional and personal home.

At that time, Anthony Hughes told me that 1982 was the centennial of Emmy Noether’s birth. I called Bhama, who was then president of AWM, and suggested an international conference at Bryn Mawr for the occasion (Bhama credits me with the idea, but it was really Anthony’s). Perhaps because I was at a new institution and realized I would have to do everything myself, I charged ahead. Soon I received a call from Alice, who was at the Joint Meetings. She reported that some people were “concerned.” Apparently, I had gone rogue. I grudgingly tried to learn to collaborate and get a variety of opinions, and ultimately the conference was a great success, even though my daughter Sarah, under two at the time, got the croup the night before the conference started, putting everything in perspective.

I always credited Jill Mesirov for my presidency. We had met by chance in Princeton and I was asked to be the next AWM president shortly thereafter.

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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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Institutional Membership Levels

Category 1: \$325

Category 2: \$325

Category 3: \$200

See awm-math.org for details on free ads, free student memberships, and ad discounts.

Executive Sponsorship Levels

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\$2500–\$4999

\$1000–\$2499

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Regular and contributing members living in the US may elect to receive a print version of the *Newsletter*. Libraries, women’s studies centers, non-mathematics departments, etc., may purchase a subscription for \$75/year. Back orders are \$10/issue plus shipping/handling (\$5 minimum).

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

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

Newsletter Deadlines

Editorial: 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.

Addresses

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 Kose, student-chapters@awmmath.org. Send everything else, including ads and address changes, to AWM, awm@awm-math.org.



ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM ONLINE

The *AWM Newsletter* is freely available online.

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

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

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Associate Media Coordinator

Denise Rangel Tracy

AWM DEADLINES

AWM Fellows: May 15, 2020

AWM Louise Hay Award: May 15, 2020

AWM M. Gwenyth Humphreys Award:
May 15, 2020

AWM Student Chapter Awards:
May 15, 2020

AWM Travel Grants:
May 15 and October 1, 2020

RCCW Proposals: July 1, 2020

AWM Workshop at JMM:
August 15, 2020

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PRESIDENTS' REFLECTIONS *continued from page 3*

Perhaps Linda Keen, the AWM president at that time, was there as well but I'm not really sure. Nevertheless, I was deeply honored and took the charge of standing for women in mathematics very seriously.

My son Jeremy was born in the summer of 1986, when I had already agreed to be AWM president. I thought I could handle two big life events. Then, in the spring of 1987, my colleague and department chair, Mario Martelli, entered my office and told me, in his lovely Italian accent, that his work at Bryn Mawr was done and he was leaving for California. I would become department chair, effective almost immediately. This was not good news. I had not thought that I would be department chair until my presidency was over. I was convinced I couldn't do three big things at once, and certainly not that I could do them well.

The first national meeting where I would set the agenda as president was indeed memorable. It was Salt Lake City in the summer of 1987. The executive director Lori Kenschaft and I reserved a large conference room with mints, coffee, water, crisp pads of paper and pens, ready for our Executive Committee meeting. Other than us, no one came. Later, at the business meeting, someone asked me what my "long-term plans" were. Yikes. On the plane home, in full panic mode, I got to work. This was not going to be easy.

One of the first positive things I did, once I got my bearings, was apply to NSF to start the Travel Grant Program. I felt the ability to travel was an important one, especially for early-career mathematicians without other forms of support. I'm pleased that this program has endured, transformed, and considerably expanded to give women much-needed support for their research.

In 1988, I received the devastating news that Louise Hay had passed away. It was challenging to think of how to properly honor this remarkable woman who had had a profound influence on so many. Even though Louise was a respected logician, I felt that it would be appropriate to honor her with a teaching award. After all, she was "the consummate educator." I proposed the Hay Award to the Executive Committee, which immediately approved the plan. Louise's family felt it was a fitting tribute to a great woman; the first Hay Award was given to Shirley Frye in 1991.

On the occasion of Alice's retirement from Wellesley, I proposed the Schafer Prize for Excellence in Mathematics by an Undergraduate Woman as a way to recognize her extraordinary contributions to women in mathematics. When my term ended, the next president, Jill Mesirov, raised funds to endow the prize. This gave Alice great pleasure. It was also a thrill for the talented young recipients to meet Alice and for her to meet them. I believe we should try to honor people when they are alive and well enough to appreciate it. Many former Schafer Prize winners are now highly respected mathematicians.¹

The AMS Centennial took place during my presidency. I recall speaking on behalf of AWM in front of several thousand people, and hearing only my son talking in the audience. The AMS gave AWM a silver-plated bowl in honor of the

¹ See Joe Gallian's article in the June 2019 *Notices of the American Mathematical Society* (<https://ams.org/journals/notices/201906/rnoti-p870.pdf>) or the list of winners at <https://awm-math.org/awards/schafer-prize-for-undergraduates/>.

centennial, and I established the “passing of the bowl” to the new AWM president.²

Another dressing-down came at the 1989 JMM in Atlanta, my last meeting as president. It was there that Lee Lorch introduced me to Sylvia Bozeman. She and I were both department chairs, and he thought we should meet one another. That meeting resulted in a fruitful twenty-year-plus collaboration that led to the EDGE Program. It was also the scene of the great Atlanta snowstorm of 1989. There were three inches of snow, abandoned cars everywhere, and the city was shut down for a week. I had organized a panel of eminent women mathematicians and afterwards, Lee approached me and said it was a good panel, but I had made an error by not including women of color. Of course he was right. What I (eventually) loved about the AWM elders (I guess I am now one) was that they did not hesitate to tell you when you went astray.

As president, I was extraordinarily busy. When my friend Ami Radunskaya was president, I watched in awe as she made it all look easy, running the EDGE Program and research conferences, teaching, and mentoring everyone in need, all at the same time. When I was president, I was shocked at how many committees I was asked to be on. I said yes to everything, and at one national meeting had so many committee meetings in one day I lost track of which I was

² See the March–April 2019 newsletter for a recent photo of the “passing of the bowl.”

attending. In those days, women and people of color were still fairly scarce on committees. Because of this, I met one of my dearest friends, Don Richards. He and I seemed to turn up on so many committees together, we got to know one another quite well. That way, I also met Lloyd Douglas, the legendary NSF program director who was an early champion of the EDGE Program. So something positive came of committee work.

My presidency came at a time when AWM had gained some acceptance, so I did not have to display the bravery or perseverance of my predecessors. Everyone wanted AWM to be represented, perhaps only to check a box, but we got in the rooms where it mattered. Today, AWM has established many new initiatives that encourage and support women in their research and teaching careers. There is an impressive portfolio of programs, awards, and initiatives to show for almost 50 years of sustained effort.

In closing, I hope that moving forward AWM can find a way to appeal to more mathematicians of color, expanding representation on its committees and among its officers. This has always been a challenge for AWM, but I do see that change is in the air, at long last.

I should not close without thanking the people who provided the institutional memory of AWM and helped me enormously: of course, the late Alice Schafer, cofounder and second president; Anne Leggett, our intrepid newsletter editor; Bettye Anne Case, longtime meetings coordinator (1984–2015); and Mary Gray, cofounder, first president, and all-around inspiration. Thank you all.

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/awm-grants/travel-grants/>) for details on eligibility and do not hesitate to contact awm@awm-math.org or 401-455-4042 for guidance.

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

AWM at the Denver JMM

Thousands gather each year for the Joint Mathematics Meetings, the largest gathering of mathematicians in the country. This year the event was held in Denver, January 15–18, 2020. AWM uses this venue to recognize and showcase the work of exceptional women. These honors span the career spectrum—from the Schafer Prize for undergraduate research to the Noether Lecture for a career of distinguished research—as well as the ways in which we can support the mathematical sciences—research, teaching, mentorship, and volunteerism. We are pleased to announce this year’s honorees. (More information on many of them may be found in the *AWM Newsletter*, Issues 4–6, 2019.)

AWM-AMS NOETHER LECTURE

The lecture honors Emmy Noether (1882–1935), one of the great mathematicians of her time. She worked and struggled for what she loved and believed in. Her life and work remain a tremendous inspiration.

This year’s AWM-AMS Noether Lecturer was **Birgit Speh** (Cornell University), who spoke on “Branching Laws for Representations of Non Compact Orthogonal Groups.” This talk was very well received, with over 200 attendees. Birgit’s talk wove in numerous connections to the lecture’s namesake, Emmy Noether.

Abstract: Finite dimensional representations of classical groups were first treated systematically by Hermann Weyl in his famous book *The Classical Groups: Their Invariants and Representations* 80 years ago. He classified in this book the irreducible representations $\Pi: \mathrm{SO}(n) \rightarrow \mathrm{Aut}(V)$ for finite dimensional vector spaces V . H. Weyl also considered the restriction of an irreducible representation to a subgroup and proved that the restriction of a finite dimensional representation is a direct sum of finite dimensional representations. In 1938 famous branching rules were proved describing the multiplicity $\dim \mathrm{Hom}_{\mathrm{SO}(n-1)}(\pi, \Pi)$ for an irreducible representation Π of $\mathrm{SO}(n)$ to an irreducible representation π of $\mathrm{SO}(n-1)$ by F. Murnaghan.

A noncompact orthogonal group $\mathrm{SO}(p, q)$ has also infinite dimensional irreducible representations. Unfortunately the restriction of an infinite dimensional representation of $\mathrm{SO}(p, q)$ to a subgroup $\mathrm{SO}(r, s)$ is often not a direct sum of irreducible representations. In this talk I will show that for infinite dimensional representations Π of $\mathrm{SO}(n, 1)$ and infinite dimensional representations π of $\mathrm{SO}(n-1, 1)$ we obtain very



Current AMS President and former AWM President Jill Pipher, Noether Lecturer Birgit Speh, and AWM President Ruth Haas

similar branching laws for $\dim \mathrm{Hom}_{\mathrm{SO}(n-1)}(\Pi, \pi)$, although the restriction of the representations is not a direct sum of irreducible representations.

AWM FELLOWS

The Executive Committee of the AWM has established the AWM Fellows Program to recognize individuals who have demonstrated a sustained commitment to the support and advancement of women in the mathematical sciences consistent with the AWM mission: “to encourage women and girls to study and to have active careers in the mathematical sciences, and to promote equal opportunity and the equal treatment of women and girls in the mathematical sciences.” The third class of Fellows was chosen by a nomination process. Nominations are due by May 15th for the 2020 class; see awm-math.org and page 18.

Third Class of AWM Fellows

Margaret Bayer, University of Kansas

For her far-reaching work on the combinatorics and geometry of polytopes; for a long record of successfully mentoring, advising, and supervising women in mathematics at all levels; and for her service to AWM and the profession.

Joan S. Birman, Barnard College, Columbia University

For her groundbreaking research connecting diverse fields, and for her award-winning expository writing; for continuously supporting women in mathematics as an active mentor and a

research role model; and for sponsoring multiple prize initiatives for women.

Petra Bonfert-Taylor, Thayer School of Engineering,
Dartmouth College

For her work as a US liaison and in web creation and management for the IMU's Committee on Women in Mathematics; for development and study of programs building inclusivity in STEM; and for becoming an example of broadening research interests, by adding research in medical imaging to work in complex analysis.

Susanne C. Brenner, Louisiana State University

For being a role model nationally and internationally due to her widely known work in finite element methods; for her promotion of women in mathematics via the Women in Numerical Analysis and Scientific Computing network, as mentor of PhDs, and as advisor of graduate and undergraduate students.

Jennifer Chayes, Microsoft Research

For pioneering the way for women in the mathematical sciences to have leading technical roles in the high-tech industry; for extraordinary leadership and mentoring on behalf of women in the mathematical sciences.

Alissa S. Crans, Loyola Marymount University

For mentoring and supporting women at Loyola Marymount

and through EDGE, SMP, SPWM, and Project NExT; for her role in the Pacific Coast Undergraduate Mathematics Conference, recognized as an AMS Program That Makes a Difference.

Donatella Danielli, Purdue University

For her generous and consistent involvement in, and remarkable impact on, a large number of excellent local, national, and international initiatives to support interest and involvement of women in mathematics at all levels; and for remarkable, pioneering contributions positioning her as a role model for more junior mathematicians, particularly women.

Sarah J. Greenwald, Appalachian State University

For her creative and effective efforts to spark interest in mathematics among young people, especially girls; for her extensive contributions to advancing women in mathematics through writing, lectures and working with the AWM and other professional societies; and for her mentorship of students.

Leslie Hogben, Iowa State University and American Institute of Mathematics

For being an endless champion for women in mathematics for nearly 40 years; for her outstanding record of involvement in programs to promote equal treatment and equal opportunities for women and minorities in mathematics.

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CALL FOR NOMINATIONS

The Association for Women in Mathematics Student Chapter Awards

In September 2016, the Executive Committee of the Association for Women in Mathematics established the Student Chapter Awards, to be awarded annually at the MAA MathFest. The purpose of these awards is to recognize outstanding achievements in chapter activities among the AWM student chapters.

Awards will be given out in up to four categories: (1) scientific excellence, (2) outreach, (3) professional development, and (4) funding/sustainability. More details about each category can be found on the AWM website awm-math.org.

Any chapter may nominate itself for awards. The nomination should include: 1) A cover letter: The cover letter should summarize the chapter's qualifications for the award category to which it is nominating itself. If the chapter is applying in two categories, it should ensure that both categories are clearly included in one cover letter. 2) An activities report: The activities report, 500–1000 words in length, should give a detailed description of the particular work for which it is seeking an award. If the chapter is applying in two categories, a separate activities report is required for each. Nomination materials should be submitted online at [MathPrograms.org](https://mathprograms.org). The submission link will be available 45 days prior to the nomination deadline. Nominations must be received by **May 15, 2020**. If you have questions, phone 401-455-4042, email awm@awm-math.org, or visit <https://awm-math.org/awards/awm-student-chapter-awards/>.

Fern Y. Hunt, National Institute of Standards and Technology
For her exceptional commitment to outreach and mentoring; for her sustained efforts to make the AWM organization more inclusive; for her service to higher education and government; and for inspiring those underrepresented in mathematics with her work in ergodic theory, probability, and computation.

Michelle Manes, University of Hawai'i and NSF
For supporting research careers for women in mathematics through leadership in the WIN Network and AWM ADVANCE Committees to enable the formation of research networks for women in many areas of mathematics.

Maura Mast, Fordham University
For her sustained and deep contributions to promoting and encouraging the participation of women in the mathematical sciences through AWM, the Joint Committee on Women, the MAA, and through leadership in academia.

Eileen L. Poiani, Saint Peter's University
For her sustained commitment to encouraging women and the underrepresented at all educational levels to pursue their study of mathematics to keep all career doors open; for founding MAA's WAM: Women and Mathematics Lectureship Program; for leadership in Pi Mu Epsilon; and for fostering an appreciation for the power of mathematics.

Chi-Wang Shu, Brown University
For his exceptional dedication and contribution to mentoring, supporting, and advancing women in the mathematical sciences; for his incredible role in supervising many women PhDs, bringing



New Fellows Sarah J. Greenwald and Karen K. Uhlenbeck (with our apologies to Karen for starting the award ceremony early)

them into the world of research to which he has made fundamental contributions, and nurturing their professional success.

Karen E. Smith, University of Michigan
For her tireless support of women in mathematics; throughout her career, she has officially and unofficially mentored numerous female mathematicians at every level from undergraduate to full professor; she continues to be an incredibly strong role model for women everywhere.



Diane L. Souvaine,
Tufts University
For sustained advocacy, support and mentorship of women and students underrepresented in STEM fields in mathematics and theoretical computer science at multiple scales, from impacting individual mentees and advisees, to creating deep and broad institutional cultural change.

New Fellows: Diane L. Souvaine, Roselyn E. Williams, Eileen L. Polani, Margaret Bayer, Maura Mast, Leslie Hogben, Sarah Greenwald, Michelle Manes, and Alissa Crans

Karen Keskulla Uhlenbeck, Retired University of Texas
at Austin, Visitor Institute for Advanced Study

For her groundbreaking and profound contributions to modern geometric analysis; for establishing a career as one of the greatest mathematicians of our time, despite the considerable challenges facing women when she entered the field; for using her experiences navigating these challenges to create and sustain programs to address them for future generations of women. For a lifetime of breaking barriers; and for being the first woman to win the Abel Prize.

Roselyn E. Williams, Florida Agricultural and
Mechanical University

For her lifelong promotion of Historically Black Colleges and Universities and support of the EDGE Program; for her unwavering dedication to the National Association of Mathematicians; and for her unsung work to create AIM/ICERM's REUF and the National Math Alliance.



Erika Camacho

AWM PRIZES

Louise Hay Award for Contributions to Mathematics Education

In 1990, the Executive Committee of the AWM established the Louise Hay Award for Contribution to Mathematics Education. While Louise Hay was widely recognized for her contributions to mathematical logic and for her strong leadership as head of the Department of Mathematics, Statistics, and Computer Science at the University of Illinois at Chicago, her devotion to students and her lifelong commitment to nurturing the talent of young women and men secure her reputation as a consummate educator. The annual presentation of this award is intended to highlight the importance of mathematics education and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being.

Citation for Erika Camacho

In recognition of her leadership and contributions as a mathematical scholar and educator, the AWM presents the 2019 Louise Hay Award to **Erika Camacho** of Arizona State University. Camacho has a passion for mentoring, especially the mentoring of underrepresented students. Her mentoring begins with her excitement for mathematics based in her research in mathematical physiology. This research involves developing mathematical models that describe the interactions of photoreceptors in the retina. Camacho brings

graduate and undergraduate students into her research as well as finding opportunities for students with other researchers.

Through her work Camacho changes perceptions. Her own story is an existence proof that someone from an underprivileged and Latina background can earn a PhD in mathematics and be a successful mathematician. In her over 65 plenary and panel presentations she uses her story to inspire students to persevere and succeed in mathematics. Beyond presenting, Camacho meets with attendees individually afterwards to learn about their stories and give them advice based on their own interests and passions. By inspiring more women and members of underrepresented groups to continue in their mathematical pursuits she enlarges the scope of what we see as successful mathematicians.

Response from Camacho

I am humbled to receive the Louise Hay Award for Contributions to Mathematics Education. Dr. Hay was truly a role model for breaking down barriers and creating the supportive environment that allowed many to succeed. Whether in the classroom, mentoring through research, or sharing some of the struggles that I have overcome, I can often empathize with my students and other mentees in my efforts to help them find a good way forward. My mentors have helped me in a similar way and I have likewise tried to create a nurturing environment for my students and mentees. Beginning with my high school teacher Jaime Escalante, through key professors at Wellesley College (BA) and Cornell

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University (PhD), and finally to those that have helped me navigate an often-challenging academia, I have needed each of them to succeed (and fail!) and help make me into who I am. Hay's personal story is so inspiring, and I thank the AWM for creating this award to help honor her legacy. Her lifelong commitment to nurturing the talent of young women and men exemplified her desire to build scientific capacity long before the phrase became popular. Creating a truly inclusive mathematical workforce is a goal all of us should have and one of my lifelong passions.

M. Gweneth Humphreys Award for Mentorship of Undergraduate Women in Mathematics

The award is named for M. Gweneth Humphreys (1911–2006). Professor Humphreys graduated with honors in mathematics from the University of British Columbia in 1932, earning the prestigious Governor General's Gold Medal at graduation. After receiving her master's degree from Smith College in 1933, Humphreys earned her PhD at age 23 from the University of Chicago in 1935. She taught mathematics to women for her entire career, first at Mount St. Scholastica College, then for several years at Sophie Newcomb College, and finally for over thirty years at Randolph-Macon Woman's College. This award, funded by contributions from her former students and colleagues at Randolph-Macon Woman's College, recognizes her commitment to and her profound influence on undergraduate students of mathematics.



Margaret Robinson



Denise Rangel Tracy and Raegan Higgins with Ruth Haas

Citation for Margaret Robinson

Margaret Robinson has been a mainstay of caring and thoughtful teaching and mentoring for many years at Mount Holyoke College, an institution whose mission is to educate women. Her focus is not just on the top students, but on making a meaningful (and joyful) mathematical intervention for all the generations of learners that have crossed her path. As one student put it, “she saw me in a way that no mathematics teacher had before.” Her impactful involvement in the Carleton Summer Math Program and the resounding response from a range of former mentees speak to her effectiveness and her ability to forge personal connections. We are pleased to honor her with the M. Gweneth Humphreys Award for Mentorship of Undergraduate Women in Mathematics.

Response from Robinson

I am greatly honored and delighted, and also somewhat overwhelmed, to receive the M. Gweneth Humphreys Award for mentoring. My phenomenal department and students at Mount Holyoke College have inspired me throughout my career. I would also like to thank Deanna Haunsberger and Stephen Kennedy for inviting me to teach in the Summer Mathematics Program at Carleton College and for introducing me to so many wonderful women who have enriched my mathematical life over the past 10 years. An award of this type sends the message that the AWM acknowledges and values the importance of mentoring, and I offer my heartfelt thanks to the 2020 Humphreys Award Committee.

AWM Service Awards

In 2012, AWM established the AWM Service Award to recognize individuals for helping to promote and support women in mathematics through exceptional voluntary

service to the Association for Women in Mathematics, a nonprofit organization that depends largely on the work of its volunteer members.

Citation for Raegan Higgins, Texas Tech University

Raegan Higgins for her extraordinary efforts in promoting women in mathematics through her role on the organizing committees of the 2017 and 2019 AWM Research Symposia. Professor Higgins' leadership in fostering synergistic connections between the AWM and the local community by identifying organizations and individuals who have made a difference has broadened our reach and furthered our mission of creating a more inclusive community.

Response from Higgins

I am so surprised and happy to receive the 2020 AWM Service Award, and I thank AWM for this recognition. I worked to help AWM show its more inclusive side, to show it's not just for mathematicians in academia, government and industry. It is important to *reach and recognize* the community that has shaped and continues to shape female mathematicians. I hope what I have started continues, and I look forward to helping AWM continue the work of empowering, supporting and promoting women in math.

Citation for Omayra Ortega, Sonoma State University

Omayra Ortega for representing AWM while working with the international math community to bring the Maryam Mirzakhani exhibit to the 2019 AWM Research Symposium, including negotiating for the installation and display space, coordination with Rice University, planning for long term care of the display, and acting as an honorable steward to this collection. Dr. Ortega's commitment served to invite us to see the very personal side of a very public mathematician.

Response from Omayra

It has been my great pleasure to serve the Association for Women in Mathematics over the years in many different roles, but bringing the Committee for Women in Mathematics' Remembering Miryam Mirzakhani Exhibit to the 2019 Research Symposium was one of my favorites. These efforts were a labor of love and were more than redeemed as I watched the reactions of attendees as they took in images of tender moments and insightful thoughts of this pioneering contemporary mathematician whose life was cut short during the peak of her career. Since the Research Symposium, this important exhibit has continued to inspire and be displayed at other



Omayra Ortega with Karoline Pershell

locations including the Institute for Advanced Studies, Pomona College, and the Joint Mathematics Meetings in Denver, Colorado. I am humbled to have been nominated by my peers and selected by the Executive Committee for this 2020 AWM Service Award. Thank you for this honor.

Citation for Denise A. Rangel Tracy, Fairleigh Dickinson University

Denise A. Rangel Tracy for her deep commitment to the work of the Media Committee and her unflinching efforts to portray AWM positively in the media. Tracy has obtained funding for and led Wikipedia Edit-a-thons at both the Joint Math Meetings and the AWM Research Symposium. She initiated the AWM Playing Cards Project and tracked down and created preliminary lists and data on over a thousand women for that project.

Response from Rangel Tracy

Thank you for this award. I am happy to be able to better highlight the accomplishments of women in mathematics, both past and present. I appreciate the support AWM has given to start working on the Women in Math Playing Cards and thank you to all the other volunteers now involved in making this project a reality. It'll be a great way to showcase

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some of the amazing mathematicians who also happen to be women. I especially hope this makes it to the non-math world. I often feel like the general public doesn't fully understand who we are or what we do as mathematicians (besides teach). Although stereotypes are changing, women are still thought of as a rarity in the mathematical sciences. I think Wikipedia can be a gateway to learning about these women. Our history, our achievements, our struggles, all summarized a few mouse-clicks away from each other on a website many people already visit. I hope by working to improve and create new articles on women mathematicians I am helping people better know them and the work that they do.

AWM-Microsoft Research Prize in Algebra and Number Theory

The Executive Committee of the AWM established the AWM-Microsoft Research Prize in Algebra and Number

Theory in 2012. First presented in 2014, this prize is awarded every other year to highlight exceptional research in analysis by a woman early in her career.

Citation for Melody Chan

The 2020 AWM-Microsoft Research Prize in Algebra and Number Theory is presented to Professor **Melody Chan** of Brown University in recognition of her spectacular advances at the interface between algebraic geometry and combinatorics.

Chan is known for an exceptional combination of strength in both combinatorics and algebraic geometry, as well as her ability to fearlessly digest difficult techniques from other fields of mathematics. Chan has proved numerous conjectures across tropical geometry, graph theory, and algebraic geometry. In Chan's recent work with Galatius and Payne, they showed that the top degree cohomology of the moduli space of genus g curves grows exponentially in g , an astounding result which contradicts conjectures of Kontsevich and Church-

CALL FOR NOMINATIONS

2021 M. Gweneth Humphreys Award

The Executive Committee of the Association for Women in Mathematics has established a prize in memory of M. Gweneth Humphreys to recognize outstanding mentorship activities. This prize will be awarded annually to a mathematics teacher (of any gender) who has encouraged female undergraduate students to pursue mathematical careers and/or the study of mathematics at the graduate level. The recipient will receive a cash prize and honorary plaque and will be featured in an article in the AWM newsletter. The award is open to all regardless of nationality and citizenship. Nominees must be living at the time of their nomination.

The award is named for M. Gweneth Humphreys (1911–2006). Professor Humphreys graduated with honors in mathematics from the University of British Columbia in 1932, earning the prestigious Governor General's Gold Medal at graduation. After receiving her master's degree from Smith College in 1933, Humphreys earned her PhD at age 23 from the University of Chicago in 1935. She taught mathematics to women for her entire career, first at Mount St. Scholastica College, then for several years at Sophie Newcomb College, and finally for over thirty years at Randolph-Macon Woman's College. This award, funded by contributions from her former students and colleagues at Randolph-Macon Woman's College, recognizes her commitment to and her profound influence on undergraduate students of mathematics.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted. Nominations for members of underrepresented minorities are especially encouraged. The nomination documents should include: a nomination cover sheet; a letter of nomination explaining why the nominee qualifies for the award; the nominee's vita; a list of female students mentored by the nominee during their undergraduate years, with a brief account of their post-baccalaureate mathematical careers and/or graduate study in the mathematical sciences; and supporting letters from colleagues and/or students. At least one letter from a current or former student of the candidate must be included.

Nomination materials for the Humphreys Award shall be submitted online. See the AWM website at awm-math.org for nomination instructions. Nominations must be received by **May 15, 2020** and will be kept active for three years at the request of the nominator. For more information, phone 401-455-4042, email awm@awm-math.org or visit <https://awm-math.org/awards/humphreys-award/>.



Melody Chan

Farb-Putman that said this cohomology should vanish. This breakthrough comes from a deep study of moduli spaces of tropical curves. Chan's foundational work on the moduli of metric graphs and tropical curves, both solo and with several coauthors, is central to the field, already having important applications, and is expected to continue to lead to further work far beyond the original papers. Chan's work with Pflueger, López Martín, and Teixidor i Bigas proves beautiful new results on the expected number of turns in a random Young tableau and then applies them to give explicit topological information on Brill-Noether varieties that seemed beyond reach before their work. Other researchers call Chan a "leader" and a "major force" and are impressed by both her insights and her technical prowess. AWM congratulates Melody Chan for her well-deserved AWM-Microsoft Research Prize.

Response from Chan

I am happy to receive the 2020 AWM-Microsoft Prize in Algebra, and I thank the AWM and Microsoft for their generosity in recognizing my work. I have learned so much from my close collaborators: Renzo Cavalieri, Søren Galatius, Sam Payne, Nathan Pflueger, Martin Ulirsch, and Jonathan Wise. I'm also grateful for the support and mentorship of Dan Abramovich, Matt Baker, Lucia Caporaso, Joe Harris, Diane Maclagan, and especially my PhD advisor Bernd Sturmfels; and many other mathematicians, including my many supportive colleagues at Brown.

Getting to do research in mathematics is a privilege. After all, basic research in math and science is a long game:

we get to study fundamental questions that may have no applications right now but, in totality and over the course of history, make an outsize impact in ways we couldn't have predicted. And we get to have fun while doing it, too. But that whole calculus is predicated on having time, having breathing room, to think about the long game at all. Right now, I'm less and less sure that we have that room. We have a climate crisis on our hands, crises of civil rights and human rights, crises of democracy and disenfranchisement, entire crises of empathy. Our country is taking children from their parents. I've never been more concerned for my country and my community than I am now.

Being a math professor is, I think, still the best thing I personally know how to do. It's getting harder to carry out basic math research—like research on the combinatorics and geometry of moduli spaces, say—with any moral certainty. But there are many parts of the job that do have an immediate impact. We must train students well, and find ways to support and include more of them in the first place; we must be role models, while interrogating our role as scientists; we must make more noise altogether. Let's work together on prioritizing these aspects of the profession, even while we push on our foundational research.

AWM-Sadosky Research Prize in Analysis

The Executive Committee of the AWM established the AWM-Sadosky Research Prize in Analysis in 2012. First presented in 2014, the prize is awarded every other year to highlight exceptional research in analysis by a woman early in her career. The award is named for Cora Sadosky, a former president of AWM, and is made possible by generous contributions from Cora's husband, Daniel J. Goldstein, daughter Cora Sol Goldstein, and friends Judy and Paul S. Green and Concepción Ballester.

Citation for Mihaela Ignatova

The 2020 AWM-Sadosky Research Prize in Analysis is awarded to **Mihaela Ignatova**, Temple University, in recognition for her contributions to the analysis of partial differential equations, in particular in fluid mechanics. Ignatova received her PhD in 2011 from the University of Southern California and has held appointments at the University of California-Riverside, Stanford University, and Princeton University. She works on challenging analytical questions motivated by problems rooted in applications. The breadth of her work is impressive, spanning from unique continuation properties to fluid-structure interaction problems to non-local models in electroconvection. For example, her

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Mihaela Ignatova

work with Kukavica and Ryzhik extends considerably the validity of Harnack inequality to second-order operators with rough drifts. Her remarkable technical abilities are evident in several of her works, in particular in her study, joint with Peter Constantin, of the critical Surface-Quasi-Geostrophic equation in bounded domains. Ignatova developed a new approach to deal with boundaries, which provides also an alternative approach for the case without boundaries. Ignatova's work on fluid-structure interaction problems, joint work with Kukavica, Lasiecka, and Tuffaha, establishes well-posedness of a system coupling the fluid equations with a wave equation for an elastic structure with a moving free interface, and it is highly non trivial. This work highlights again Ignatova's outstanding analytical skills, her unusual creativity, and her taste for physically based problems. Ignatova is among the most talented young analysts in fluid mechanics and partial differential equations and is poised to become a leader in the field. She deserves the recognition that the AWM-Sadosky Prize entails.

Response from Ignatova

I am truly honored to receive the AWM-Sadosky Research Prize in Analysis. The area of my research, analysis of PDEs, relies much on the methods of harmonic analysis, the field of Cora Sadosky, and it is a privilege to be recognized among the many excellent people who work in analysis. It's particularly gratifying to be awarded this prize by AWM, an organization whose support for women in mathematics is of great importance to society.

I would like to take this opportunity to thank some of the people who helped me to become a research mathematician. My masters thesis advisor Emil Horozov impressed me with his knowledge and brilliance and encouraged me to pursue a career in math. I am greatly indebted to Igor Kukavica, who was my doctoral advisor and continues to be my collaborator, for his honest, uncompromising and deep approach to mathematical research, and I thank him for his kind and thoughtful mentorship over the years. I appreciate very much the opportunities I have had to work with powerful and creative collaborators in the area of analysis of PDEs originating from fluid mechanics and physics. I also wish to thank the leading mathematicians working in my area with whom I interact and from whom I have learned a lot, and who continue to inspire me.

AWM Dissertation Prizes

In January 2016 the Executive Committee of the AWM 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 2020 prizes were awarded to **Elena Giorgi** for "The linear stability of Reissner-Nordström spacetime for small charge," **Nicole Lopper** for "Uniformity in Polynomial Dynamics: Canonical Heights, Primitive Prime Divisors, and Galois Representations," and **Lise Sauermann** for "Modern methods in extremal combinatorics."



Elena Giorgi

Citation for Elena Giorgi

Elena Giorgi obtained her PhD in 2019 from Columbia University under the joint direction of Sergiu Klainerman and Mu-Tao Wang. She is currently a postdoctoral associate at Princeton University (Gravity Initiative). She is the recipient of several awards, including the 2017/2018 Peter and Catherine Klein Fellowship from Columbia University.

Giorgi's research interests are in differential geometry, hyperbolic PDE and general relativity. Her dissertation proves the linear stability to gravitational and electromagnetic perturbations of the Reissner-Nordström family of charged black holes with small charge, where she expresses the perturbations in geodesic outgoing null foliations. Her results rely on decay statements for the Teukolsky system of spin ± 2 and spin ± 1 satisfied by gauge-invariant null-decomposed curvature components, obtained in earlier works. She exploits these results to prove polynomial decay for all the remaining components of curvature, electromagnetic tensor and Ricci coefficients, and shows that this decay is optimal (in the sense that it is the one which is expected to hold in the non-linear problem).

Giorgi's work has led to several single-authored publications, including "On the local extension of Killing vector fields in electrovacuum space-times," *Ann. Henri Poincaré*, Vol. 20, Issue 7 (2019), 2271–2293, and "Boundedness and decay for the Teukolsky equation of spin ± 1 on Reissner-Nordström spacetime: the $\ell = 1$ spherical mode," *Class. Quantum Grav.*, Vol. 36, Number 20 (2019). Her letter-writers concur that "Her thesis turns out to be an important and truly significant contribution to the field of mathematical General Relativity. Her results are impressive and directly consequential."

Response from Giorgi

I am thrilled and honored to receive the AWM Dissertation Prize, and I would like to thank the committee for nominating me for this award. I am very grateful to my advisors Sergiu Klainerman and Mu-Tao Wang for their guidance and support during the writing of my thesis and for all the mathematics they taught me during these years. My work would have not been possible without the friendly and stimulating environment at Columbia and Princeton University, where I was lucky enough to have access to leading experts in General Relativity and PDEs. Their work enriched my passion towards the study of gravity and made me feel a part of a growing community, for which I will always be grateful.

Citation for Nicole Looper

Nicole Looper obtained her PhD in 2018 from Northwestern University under the supervision of Laura



Nicole Looper with Ruth Haas

DeMarco, in the area of arithmetic dynamics. She is currently a Tamarkin Assistant Professor at Brown University, after a one-year postdoc at the University of Cambridge. She was awarded a three-year NSF Postdoctoral Research Fellowship, and the Best Thesis Award by the Northwestern Math Department.

In her dissertation, Looper proved three major results, published as "A lower bound on the canonical height for polynomials," *Math. Annalen* 373 (2019), 1057–1074, "Dynamical Galois groups of trinomials and Odoni's Conjecture," *Bulletin of the LMS* 51 (2019), 278–292 and "The *abc*-Conjecture implies uniform bounds on dynamical Zsigmondy sets" (submitted). By ingeniously combining heights with techniques in complex and non-archimedean dynamics, such as the use of equipotential curves of Green's functions and estimates on moduli of annuli, she obtains impressive new results on points of small canonical height. According to one writer, her results "prompted a great deal of excitement and research."

Response from Looper

I am very honored and pleased to receive the AWM Dissertation Prize. I would like to express my gratitude to those who nominated me for this award, and to those who have supported me in my mathematical career. I especially thank my advisor Laura DeMarco, whose leadership and influence have left an indelible mark. I would also like to thank the Northwestern Math Department for providing a hospitable environment during my years in graduate school. Finally, I am grateful to my friends and collaborators in the mathematical community for their fresh perspectives and unfailing support.

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Lisa Sauermann

Citation for Lise Sauermann

Lisa Sauermann received her PhD in 2019 from Stanford University under the direction of Jacob Fox. She is now a Szegő Assistant Professor at Stanford University.

Sauermann works in extremal and probabilistic combinatorics. Pulling her expertise from algebraic geometry, probability, and differential topology, in her dissertation she proved several long-standing conjectures and made breakthroughs on several important problems in combinatorics. Among her results are the bounds for the arithmetic cycle removal lemma, the related k -multicolored sum-free problem, and the Erdős-Ginzburg-Ziv constant of abelian groups. She also proved the conjecture of Erdős, Faudree, Rousseau, and Schelp on subgraphs of minimum degree k , the Edge-Statistics Conjecture, and that the Milnor-Thom theorem gives an essentially sharp bound in all reasonable applications. Her work has already resulted in six papers, some of which have appeared in the *Journal of Combinatorial Theory Series A*, the *Proceedings of the London Mathematical Society*, and the *Electronic Journal of Combinatorics*. Her letter writers say that Sauermann “has achieved mastery of a wide range of techniques,” was “the driving force” in joint projects, and that her results “show an impressive amount of ingenuity and originality.” In addition, Sauermann “is also an accomplished expositor, who manages to convey the essence of her often rather technical work.”

Response from Sauermann

I am very honored to receive the AWM Dissertation Award. I would like to thank those who nominated me for

this award and those who supported the nomination with their letters. I am indebted to my advisor Jacob Fox for his guidance, mentorship and support throughout my PhD. I am also grateful to László Miklós Lovász with whom I collaborated on a part of the work in my dissertation, and to the combinatorics group at Stanford for being such a nice community. Finally, I would like to thank my family, in particular my parents, my husband and my daughter, for their love and support (and their smiles).

Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman

In 1990, the Executive Committee of the AWM established the annual Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman. The prize is named for Alice T. Schafer (1915–2009), one of the founders of AWM and its second president, who contributed greatly to women in mathematics throughout her career.

Citation for Natalie Pacheco-Tallaj, winner

Natalia Pacheco-Tallaj is a senior math major at Harvard University. She had her first experiences with research as a high school student and as an undergraduate she has participated in REUs at the University of Michigan and Williams College. Through these experiences she has three papers accepted or published in peer-reviewed journals and another that will be submitted soon. Three of these papers have focused on knot theory, and they are expected to inspire future research and be amenable to generalizations.

In addition to her research skills, Pacheco-Tallaj has excelled in course work and independent reading with mentors. She started taking graduate classes last year and is currently enrolled in the Kan seminar at MIT, while TAing Harvard’s graduate algebraic topology class. Pacheco-Tallaj’s mentors describe her as “exceptionally smart, able to absorb difficult mathematics quickly on the fly, and incredibly committed and enthusiastic.” They are delighted by her intellectual curiosity. Her enthusiasm for research has helped move her research groups forward, and her commitment to grappling with challenging material means her meetings with mentors become opportunities for both her and her mentor to learn from each other.

Pacheco-Tallaj has been an exciting and inspirational member of the mathematical communities she is part of. She has held leadership roles in Harvard’s Gender Inclusivity in Mathematics initiative for two years. Mentors describe her enthusiasm for research and learning as “contagious.” She is present in her department “all the time, collaborating on problems, and helping people who are stuck.” They

predict she will be a wonderful addition to whatever mathematical community she chooses to join.

Response from Pacheco-Tallaj

I am extremely honored to be awarded the Alice T. Schafer prize, and grateful to the AWM for all their important work in creating spaces and visibility for the many outstanding women in mathematics. I hope that I, too, can continue to contribute to this mission throughout my career.

I have many mentors and peers to thank for my development in mathematics. I am especially indebted to Professors Ivelisse Rubio and Patricia Ordóñez for instilling in me a passion for research early in my life; to Luis Cáceres and Arturo Portnoy for awakening in me a love for hard problems; to Nicholas Vlamis and Kevin Schreve for patiently explaining topology to me and inspiring me to pursue mathematics as a career; to Colin Adams for being my role model and teaching me everything from surgery to hyperbolic geometry; to Michael Hopkins for mentoring me in algebraic topology and for always having his office door open to me; to Alexander Kupers for his help reading papers and for supporting my growth as a teacher; and to Peter Kronheimer for his constant guidance throughout my undergraduate career, both academic and personal, and his dedication to helping me succeed. Finally, I would like to thank my friends and family for their continued support and encouragement.

Citation for Yuhan (Michelle) Jiang, runner-up

Yuhan (Michelle) Jiang is a senior mathematics major at the University of California, Berkeley. At Berkeley, she has excelled in her coursework, which includes many graduate-level mathematics classes as well as courses in computer science, statistics and economics. Faculty members state that the “breadth of Yuhan’s interests and the depth of her understanding is really quite remarkable.”

In addition to her coursework, Jiang has also pursued a number of research projects. Her contributions in the algebraic geometry of singular plane curves at Berkeley led to an invitation to spend the summer conducting research at MPI Leipzig. She is also conducting research in algebraic combinatorics and representation theory. Her mentors describe her as a “phenomenal talent who has a very bright research career in mathematics ahead of her.”

Response from Jiang

I am honored to be selected as a Runner-up of the Alice T. Schafer Prize by the Association for Women in Mathematics. Their work in promoting equal opportunities for women

in mathematics is highly inspiring. I would like to thank Professor Bernd Sturmfels for providing me the research opportunity, as well as his fun teaching and invaluable advice. I am grateful to Professor Vera Serganova for guiding me through various subjects. I am indebted to Cornell SPUR and Professor Florian Frick for stimulating my interest in a subject that turns out to be my passion. I am thankful to Professor Pierre Simon for his teaching and encouragement. Finally, I would like to thank the UC Berkeley math department for the education and my family for their unconditional support.

Citation for Marisa Gaetz, honorable mention

Marisa Gaetz is a senior math major at MIT. She has had great success in her math course work and research opportunities. She has also made significant contributions to make the mathematics community a more welcoming place.

Gaetz has four accepted or published papers, two preprints, and two contributions to the Online Encyclopedia of Integer Sequences (OEIS). She has participated in three REUs at the University of Minnesota Duluth, the University of Minnesota, Twin Cities, and Boise State University. She has also participated in two research opportunities during the academic year at MIT. Her most recent research experience is just beginning but she has already made remarkable progress and her work has resulted in examples that “use beautiful ideas about matrices that will be accessible and new to most mathematicians.”

Gaetz has been a member of the MIT Math Department’s Diversity and Community Building Committee for the last year and a half. The leadership of the committee appreciate her thoughtful engagement and desire to combine theoretical discussion with practical implementation. She is a staff member and social media manager of the MIT Undergraduate Math Association and the organizer of the MIT Student Colloquium for Undergraduates in Mathematics. Gaetz’s mentors have been especially impressed by her “incredible talent ... as a mentor, a community builder and tireless promoter of mathematics among young people.”

Response from Gaetz

I am honored to be selected as an Honorable Mention of the 2020 AWM Alice T. Schafer Prize. I would like to thank those who have mentored me through REU programs, as they have been instrumental to the development of my research abilities and interests. In particular, I would like to thank Professors Marion Scheepers of the Boise State University CAD REU, Pavlo Pylyavskyy and Victor Reiner of

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the UMN Twin Cities REU, and Joe Gallian of the UMN Duluth REU. Additionally, I would like to thank my older brother, Christian, and my fellow participants from these REU programs, as they have contributed greatly to my personal and mathematical growth. I am also extremely grateful to Professor David Vogan for his dedicated mentorship through MIT's UROP and UROP+ programs. I would also like to thank Professor Bjorn Poonen for his engaging teaching and invaluable advice. Finally, I would like to thank Professor Gigliola Staffilani, Professor Ju-Lee Kim, and the AWM for their inspiring work promoting diversity and equal opportunities for women in mathematics.

Citation for Alice Dinglan Lin, honorable mention

Alice Dinglan Lin is a senior mathematics major

at Princeton University. She participated in REUs at Boise State University and Emory University and was the recipient of the Peter A. Greenberg '77 Prize for outstanding achievement in mathematics. Through her research, she has demonstrated "great potential to become a successful mathematician in the future."

In 2018 at the Boise State REU, Lin co-wrote a paper on probabilistic results on elliptic pseudoprimes in the sense of Gordon and Silverman; in 2019 at the Emory REU, she co-wrote a paper on the Hecke action on a distinguished harmonic Maass form. During her junior year at Princeton, Lin independently completed a generalization of a 2018 paper on abelian surfaces parametrized by Shimura curves.

In addition to her mathematical research and outstanding coursework, she serves as the advising chair of the Princeton Math Club and is involved in running the

CALL FOR NOMINATIONS

2021 Class of AWM Fellows

The Association of Women in Mathematics Fellows Program recognizes members of any gender who have demonstrated a sustained commitment to the support and advancement of women in the mathematical sciences, consistent with the AWM mission: "to encourage women and girls to study and to have active careers in the mathematical sciences, and to promote equal opportunity and the equal treatment of women and girls in the mathematical sciences."

The following criteria are required for nominees to be considered for Fellowship.

- Nominees must have demonstrated an outstanding, sustained commitment to the support and advancement of girls and women in the mathematical sciences.
- Nominees should be a member of AWM at the time of their nomination.

In the majority of cases a nominee should be at least fifteen years into her/his/their career; graduate study counts as part of the career. Nominations will open April 1 and close **May 15, 2020**, so please participate in this year's selection process by nominating someone who you think deserves this recognition. Self-nominations are permitted. Nominations for members of underrepresented minorities are especially encouraged. The primary nominator need not be a current member of AWM, but if not should have been one at some point in the past. Anyone can write a supporting letter, whether or not they are AWM members. Nomination packages consist of:

- a nomination letter from the primary nominator of at most two pages
- two supporting letters of at most two pages each, of which at least one is from another AWM member
- a CV of 3 pages or less
- a suggested citation (for use when the award is announced) of 50 words or less.

Further information will be posted at the AWM Fellows page. At the request of the primary nominator, nominations can remain active for one additional year, and the nominator can update the application materials. Questions? Phone 401-455-4042, email awm@awm-math.org or visit awm-math.org/awards/awm-fellows/.

Mentoring Möbius program. Lin's mentors describe her as "an exceptional mathematical talent" who "makes wise choices in learning mathematics" and "pursues the highest quality," and who has "a very positive impact in the college experience of her undergraduate peers."

Response from Lin

I am very grateful to the Association for Women in Mathematics for this honor, and I appreciate the AWM's dedication to supporting women in their mathematics careers. I would like to thank the mathematics department at Princeton for their support over the past three years, particularly Professors Mark McConnell and Francesc Castella. I would also like to thank Professor Liljana Babin-kostova for encouraging me to jump into research mathematics at the Boise State REU, and Professor Ken Ono for his infectious enthusiasm and unflagging support during the Emory REU. I am especially indebted to Dr. Yunqing Tang, who advised my junior independent work and has served as an invaluable mentor, advocate, and role model.

Citation for Teresa Yu, honorable mention

Teresa Yu is a senior undergraduate student at Williams College pursuing a Bachelors in Science with a major in mathematics. Her professors at Williams describe her as "inquisitive and motivated beyond comparison" and believe that she possesses the talent to become "a phenomenal research mathematician." Yu was awarded the Erastus C. Benedict Prize (Second Place) for Outstanding Sophomore and a Clare Booth Luce Scholarship by Williams College.

Yu has also conducted research at REU programs at both Williams College and the University of Minnesota. At the SMALL REU at Williams, she worked on chip-firing games on graphs. Together with her collaborators, she has produced five manuscripts from this work. At Minnesota, Yu worked problems in commutative algebra and on convex polytopes, again impressing her mentors with her "keen insight, her mathematical talent, and her creativity."

Response from Yu

I am honored to be selected as honorable mention for this prize. The AWM's work in promoting equal opportunities for women in mathematics is highly inspiring, and I hope to help further that cause. I would like to thank the Williams math department; in particular, I am indebted to Professors Pamela Harris, Ralph Morrison, and



Marisa Gaetz, Teresa Yu, Juhan (Michelle) Jiang, and Natalia Pacheco-Tallaj with Ruth Haas

Susan Loepp for being inspiring research mentors, teachers, and mathematicians. I would also like to thank Professor Vic Reiner, Professor Christine Berkesch, Sarah Brauner, and all of the other mentors and TAs at the UMN REU for making the REU a wonderful learning and research experience. Finally, I am grateful for the other students of the SMALL Tropical Geometry group and the UMN REU, as well as for the support from my friends and family.

AWM WORKSHOP

Loredana Lanzani (Syracuse University), Liz Vivas (Ohio State University), and Karoline Pershell (AWM Executive Director)

The two-day AWM Workshop started on Friday evening, January 17, with a reception and a **Poster Session** for graduate students. The workshop continued on Saturday with an **AWM Special Session on Women in Several Complex Variables**. AWM Workshops are structured to build from previous AWM research programs, thereby reuniting researchers working in a common field to continue to build the collaboration network.

This year's special session was organized by **Loredana Lanzani** and **Liz Vivas**. Some of the talks featured research that began at the Women in Several Complex Variables (WinSCV) workshop at the American Institute of Mathematics (AIM), San Jose in 2019 and the SCV cohort of the Women in Analysis (WoAn) workshop at the Banff International Research Station in June 2019, both sponsored by the AWM ADVANCE grant. The workshop at the JMM provided opportunities for participants in this earlier WinSCV workshop and other women mathematicians in

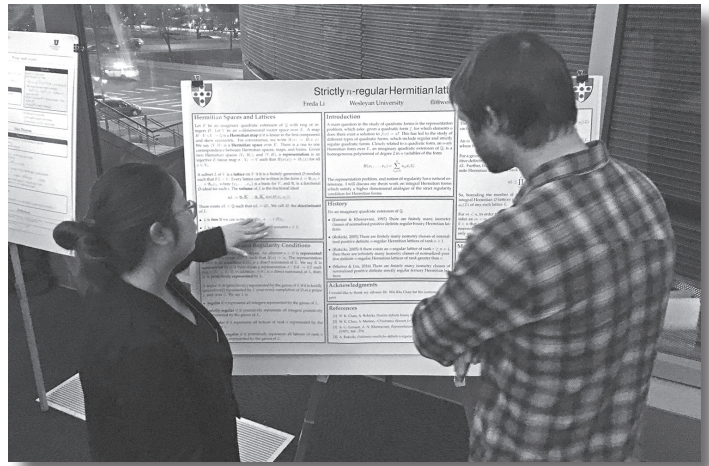
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these fields to come together, exchange research ideas, and engage in mentoring activities. Speakers and participants were very enthusiastic about the day's events and about being part of this research community. At the Saturday lunch, participants met in small groups for some focused conversations. The workshop was supported by the AWM ADVANCE grant, Career Advancement for Women Through Research Focused Networks.

The workshop topics covered Hardy Spaces of holomorphic functions, Bergman Spaces, Monge-Ampere equations, and Regularity of $\bar{\partial}$ and holomorphic dynamics in higher dimensions. Some of the talks featured research that began at the Women in Several Complex Variables (WinSCV) workshop at the American Institute of Mathematics (AIM), San Jose in April 2019, and the SCV cohort of the Women in Analysis (WoAn) workshop at the Banff International Research Station in June 2019, both sponsored by the AWM ADVANCE grant.

Plenary talks were given by **Mei-Chi Shaw** (University of Notre Dame), **Purvi Gupta** (Rutgers University), **Kate Brubaker** (Purdue University), **Jue Xiong** (Ohio State University), **Malabika Pramanik** (University of British Columbia at Vancouver), **Sara Lapan** (University of California Riverside), **Yuan Zhang** (Purdue University at Fort Wayne), **Kyounghee Kim** (Florida State University), and **Anne-Katrin Gallagher** (Gallagher Tool and Instrument).

The Friday night Graduate Poster Session was organized by **Liz Vivas**, **Loredana Lanzani**, **Radmila Sazdanovic** (NC State) and **Emilie Wiesner** (Ithaca College). At the workshop reception nineteen graduate students presented their posters. The poster session was well attended, with judges vying with numerous attendees to speak to the presenters! This was an excellent opportunity for the graduate



Freda Li explaining her poster

students to showcase their work, practice presentation skills, and to be welcomed into the research community.

The poster presenters were: **Lale Asik** (Texas Tech University), **Juliette Bruce** (University of Wisconsin-Madison), **Minyoung Jeon** (Ohio State University), **Mari Kawakatsu** (Princeton University), **Thanittha Kowan** (Florida State University), **Sabine Lang** (University of Utah), **Janina Letz** (University of Utah), **Freda Li** (Wesleyan University), **Aida Maraj** (University of Kentucky), **Maggie Miller** (Princeton University), **Kit Newton** (University of Wisconsin-Madison), **Laurel Ohm** (University of Minnesota), **Noelle Sawyer** (Wesleyan University), **Kritika Singhal** (Ohio State University), **Aleksandra Sobieska Snyder** (Texas A&M University), **Elizabeth Sprangel** (Iowa State University), **Mary Vaughan** (Iowa State University), **Julianne Vega** (University of Kentucky), and **Emily Winn** (Brown University).

The AWM Graduate Poster Session is a judged session, offering winning graduate students 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 Math Institutes co-chairs of the Mathematical Sciences Institutes Diversity Committee, **Leslie Hogben** and **Ulrica Wilson**. This year's winners were **Maggie Miller**, **Julianne Vega**, and **Emily Winn**.

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.



Poster Session

Graduate student poster presenters are funded to come to the JMM to be part of a broader AWM Workshop program. Graduate students are paired with mentors from their particular research field before the meeting and are encouraged to get in touch and schedule a time to meet their mentor at the beginning of the conference as well as at the mentoring lunch. Mentors are asked to discuss and advise participants on research-related professional development, provide specific feedback regarding the student's posters, and answer any career-related questions. Attendance at the special sessions is intended to aid graduate students in understanding the greater context for their research while connecting women graduate students to the larger network of research-active women.

A special thanks to all the speakers of the Special Session on SCV as well as to **Sarah Bockting-Conrad** for serving as mentors to the graduate students. These women shared their varied experiences and provided invaluable guidance.

AWM is grateful to **Emilie Wiesner** (Ithaca College), Poster Judging Coordinator. Emilie facilitated a thoughtful discussion among judges, bringing 20 people to consensus on the winners. While many of AWM's readers know the factors that contribute to implicit bias in awards (and theoretically how to mitigate them), the AWM organizers were happy to see this implemented. If poster judges have not previously been part of such judging, then AWM hopes this is invaluable practice to take back to their campuses.

A special thanks to the volunteer judges **Marion Campisi, Vani Cheruvu, Meghan DeWitt, Aditi Ghosh, Margaret Grogan, Katie Gurski, Caitlin Hult, Lauren Johnson-Dickman, Matt Krauel, Ariane Masuda, Dusa McDuff, Yu Pan, Sean Sather-Wagstaff, Jennifer Schultens, Miranda Teboh-Ewungkem, Denise Rangel**



Workshop participants

Tracy, Joanna Wares, Jue Xiong, and Yuan Zhang, who gave of their time to review the math, meet the graduate student presenters, and offer pointed and helpful feedback to the students, as well as to **Annalisa Calini** (College of Charleston), currently serving as NSF program director in applied mathematics, who joined the AWM mentoring lunch and kindly gave advice on proposal writing and funding programs.

A special thank you to ADVANCE Grant Co-PI **Magnhild Lien** and to AWM Meetings Coordinator **Alina Bucur** (University of California, San Diego) who are heavily involved in these grants, so as to be sure that the AWM remains a successful force for women in math.

The 2020 AWM workshop was made possible by funding from the National Science Foundation (NSF) through the ADVANCE grant Career Advancement for Women Through Research-Focused Networks (NSF-HRD 1500481) and NSF grant Graduate Student Participation in National Workshops to Encourage Women's Engagement in Mathematics Research (NSF-DMS 1636610).

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

CONNECTING THE COMMUNITY

Karoline Pershell, AWM Executive Director

The 2020 Joint Mathematics Meetings featured a number of events organized by AWM, dedicated to inspiring,
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Maggie Miller explaining her prize-winning poster

involving and retaining women in mathematics. AWM hosted a range of events: the AWM Moving Towards Action Workshop on creating healthy working environments, the AWM-Spectra Panel Discussion “Queer Families,” the open AWM Business Meeting for members to talk directly to AWM leadership and to connect Student Chapters, the AWM Reception and Awards Presentation, the AWM-AMS Noether Lecture, the presentation of awards at the Joint Prize Session, the AWM Workshop Poster Presentations by Women Graduate Students and Reception, and the AWM Workshop WinSCV: Women in Several Complex Variables.

We were so pleased to again learn of and support events happening across JMM that championed the research work of women. Several sessions reached out to receive AWM in cooperation status, meaning it was often a dual AWM-AMS or AWM-MAA sponsored session. AWM also promoted events that featured inclusivity and diversity in mathematics, and provided support for women and other underrepresented minorities so that all can feel welcome to do their best work. Reach out to us so we know to share your sessions next year!

AWM Executive Committee Meeting. In addition to the normal management of a 49-year-old organization, this year’s EC meeting had an unexpected changing of the guard: AWM EC Member **Talia Fernós** needed to step down due to time constraints resulting from the over-commitments all too commonly placed on successful people from underrepresented groups. AWM EC candidate, **Michelle Snider** (who had been attending the meeting to report on AWM Hill Days), was immediately transitioned to the role. The AWM is grateful for all of our volunteers, and



A shell-shocked Michelle Snider, EC Member Pamela Harris, former AWM Presidents Sylvia Wiegand and Cathy Kessel, and Associate Newsletter Editor Sarah Greenwald



Moving Towards Action participants

supports every one as we cycle through life, and as our ability to volunteer our time and energy ebbs and flows. Everyone is invited to take care of yourselves first, to feel welcome to return when you can, and to be cognizant of when you and others are shouldering oversized burdens. Let’s continue to reach out, to expand the community of people who are working towards equity in our profession. Thanks to everyone reading this for being on that path!

Moving Towards Action Workshop. When members of the mathematics community are made to feel unwelcome in our profession, the success of mathematics as a whole is put into jeopardy. This workshop focused on understanding and creating welcoming environments (providing action ideas and plans for procedural change to mathematics departments interested in driving cultural change) so as to invite more people to enter and persist in STEM disciplines. AWMers **Maeve McCarthy, Vrushali Bokil, Elizabeth Donovan, Ami Radunskaya** and **Karoline Pershell** developed the workshop in response to the findings and recommendations of the 2018 NASEM report on Harassment of Women in STEM. As the organizers process the successes, possible improvements and next steps, we will be sharing information with the AWM community so that additional events and support can make significant improvement towards the retention of all people in mathematics. Look in the next *AWM Newsletter* for follow up!

Queer Families and Mathematical Careers. Balancing a career in math with having a family is something we discuss a lot in women in math spaces, but those discussions often leave out the experiences particular to LGBTQ+ mathematicians and their families. This year’s AWM-Spectra panel broadened the conversation about the interaction between family and career to include and represent queer families, using an expansive, inclusive definition of family. Organizers **Alice Mark, Corrin Clarkson,**

and **Alexander Hoover** will be writing up a transcript of the panel and meaningful advice for an invited article in the *Notices of the AMS* (expected to come out June/July 2020). To learn more about Spectra see <http://www.lgbtmath.org/>.

AWM-Endorsed Events. AWM was pleased to endorse special sessions, most of which sprang from the AWM Research Collaboration Networks, an outcome of AWM's NSF ADVANCE grant: AWM Women in Symplectic and Contact Geometry (Organizers: **Melissa Zhang, Morgan Weiler, Catherine Cannizzo**), AWM Women in Math Biology (Organizers: **Christina Edholm, Amanda Laubmeier, Katharine Gurski, Heather Zinn Brooks**), AMS-AWM Women in Topology (Organized by **Jocelyn Bell, Rochy Flint, Candice Price, Arunima Ray**), AMS-AWM Mathematical and Computational Research in Data Science (Organizers: **Linda Ness, F. Patricia Medina, Kathryn Leonard**), and AWM-sponsored Math and Motherhood (Organizers: **Emille Lawrence, Della Dumbaugh, Carrie Diaz Eaton**). And don't forget to check out www.awmadvance.org to learn more about Research Collaboration Networks!

AWM Member Business Meeting. At this year's meeting, President Ruth Haas quickly moved past "checking the box" on the AWM Member Business Meeting and instead invited students and student chapters to come together and discuss successes and problems they were facing. Just given the space to connect, discussions went on for a full hour, with shared ideas for future engagement amongst members and with the AWM.

We hope that AWMers feel free to contact us throughout the year with their concerns, questions and needs. Please reach out!



Wikipedia Edit-a-Thon

Wikipedia Edit-a-Thon. AWM members **Denise Rangel Tracy** (Associate Media Coordinator) and **Marie Vitulli** (Media Coordinator) organized another successful gathering to introduce people to Wikipedia editing. The event, intended to improve and create new articles on Wikipedia about women in mathematics as well as their accomplishments, was a success: more than a dozen experienced and new editors connected to change the digital narrative of women in mathematics.

The AWM Booth. The AWM Booth again served as a gathering spot to connect (and reconnect!) with the community. The booth was almost always busy with people dropping in to say hello, or supporting AWM by purchasing a t-shirt and inquiring about future ways to be involved. Thank you to volunteers **Michelle Snider, Penny Wu, Kayla Murray, Lynne Ipina, Sherli Koshy-Chenthittayil, Lihong Zhao, Keisha Cook, Kira Hamman, Mirjeta Pasha, and Rebecca Terry** for your time and care in representing AWM at the exhibitor's booth. And special thanks to outgoing AWM Managing Director, **Steven Ferrucci**, always ready to welcome people to this tiny but powerful org. (See the photo on page 24.) Thanks, Steven, for all you have done to help grow AWM's work.

AWM received special recognition for reaching our 25th year of officially exhibiting at JMM! What were you doing in 1995?! We were here.

If you did not get your questions answered at JMM, please write to us at awm@awm-math.org to learn more about any of these initiatives.



Moving Towards Action Workshop session

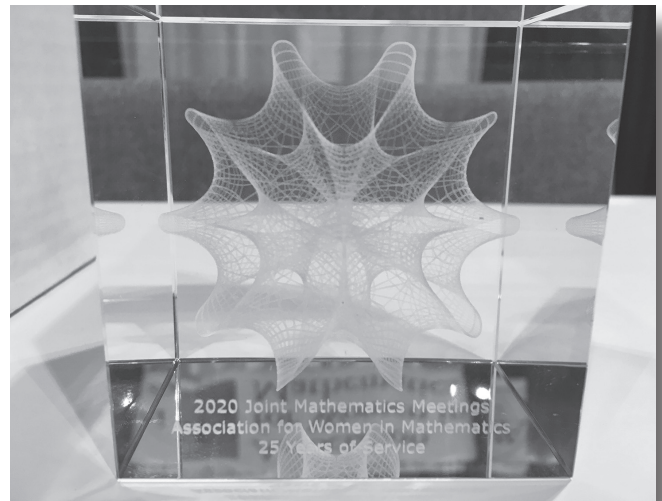
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Steven Ferrucci at the AWM booth



Wikipedia Edit-a-Thon



AWM's JMM award

Job Interviews in Hotel Rooms are Inappropriate. AWM's Executive Director is a member of the Exhibits Advisory Subcommittee of the Joint Meetings Committee and was able to have closer discussions with major meeting organizers who take seriously hotel interviewing as an unprofessional practice that is off-putting to candidates. Discussing the recent article by AWM Executive Committee Member **Pamela Harris** and co-authors **Susan Crook**, **Alicia Prieto Langarica**, and **Lola Thompson**, committee members immediately identified the long list of initiatives they have and discussed additional venues to communicate with the math community that (1) this shouldn't happen, and (2) as a candidate in an unfair power dynamic, you should report instances of this so those in power can address it. The JMM Interviewing Policy addresses the use of hotel rooms for interviews. AMS Executive Director, **Catherine Roberts** (who has contacted and discussed the issue with all colleges and universities that have been reported to AMS), highlighted that if anyone encounters interviewing practices that make them uncomfortable, please use EthicsPoint to report such practices as a violation of the JMM Welcoming Environment Policy. (EthicsPoint is a site that allows for anonymous reporting and interaction.) Direct Link to the Reporting Tool: www.mathsociety.ethicspoint.com

AWM wants to thank JMM organizers for having been working to change these practices for many years, and invites the community to keep pushing back as we all get to the same page on this issue.

BOOK REVIEW

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

The Autobiography of a Transgender Scientist, by Ben Barres, The MIT Press, 2018, ISBN 978-0262039116

Reviewer: Marge Bayer

The late Ben Barres, who was professor and chair of neurobiology at Stanford University, had a unique perspective on gender issues in science. He pursued his education (including MD and PhD) and started his career as Barbara Barres. At the age of 43, after receiving tenure at Stanford, Barbara learned about the possibility of gender transitioning and started the process of becoming male. This autobiography was published after his death from cancer at age 63.

About a third of this short book is devoted to explaining Barres's scientific research. He was a leader in the study of glial cells in the brain. The rest of the book tells the story of his life and describes his mentoring and advocacy work. In 2006 Barres published in *Nature* a commentary¹ in response to the infamous statements by Lawrence Summers about innate differences in aptitude by gender. Also available on the web is a video of a 2008 Harvard lecture, "Some Reflections on the Dearth of Women in Science."² You can also find other Barres videos on YouTube, including one on "How to Pick a Graduate Advisor."

Ben Barres describes his childhood as Barbara, when she was a nerdy "tomboy," with feelings he was later able to describe as gender dysphoria. She decided at age 13 that she wanted to go to college at MIT. This was not suggested by her parents, who had not gone to college and who, he says, had never heard of MIT. Her high school guidance counselor told her she would never get into MIT, but she was admitted early decision. Barres says that she loved MIT, but this is in spite of the lack of encouragement and downright prejudice she faced as one of the small minority of female students. When she was the only one to solve a difficult problem in an artificial intelligence course, the professor said that her boyfriend must have solved it. No male professor offered her a position in his lab, and she ended up working in the lab of a

young female professor, who did little mentoring (presumably because of her own pressures). Her summers in college were spent working at Bell Labs, but Barres describes little of that experience.

After graduating from MIT in 1976, Barbara Barres went to medical school at Dartmouth, with the goal of becoming a medical researcher. Discrimination there was quite blatant. The anatomy professor's lecture included inappropriate slides of nude women. Women's questions were ignored, women students had trouble finding positions in labs, and clinical faculty largely ignored the women students. Following medical school Barbara did a neurology residency, and after that she entered the PhD program in neuroscience at Harvard. While she encountered an extremely sexist chief neurologist during her residency, she found wonderful mentors, both male and female, in graduate school.

Barres believed that a possible factor in his gender dysphoria was that his mother was treated with a testosterone-like drug during pregnancy. In her late teens, Barbara learned that she had a condition called Mullerian agenesis, lacking a uterus and vagina. Over the years, Barres felt a lot of anguish, even suicidal thoughts. She saw therapists at times, but never discussed gender with them. Before the late nineties, she had never heard the word "transgender." Then she learned that there were other people with the same feelings, and that treatment was possible. But she struggled with the consequences of transitioning. Would she be ostracized by colleagues, lose grants, have difficulty attracting students? She consulted with three mentors and colleagues and found them very supportive. She then sent a long letter (reproduced in the book) to colleagues, friends and family, before starting testosterone treatment. The response was all supportive. This might not seem surprising to us now, but this was 1997, when there was much less awareness of gender transition. Indeed, Barres says that in 1997, it was thought that about 1 in 20,000 people were transgender. Now that ratio is believed to be 1 in 200. In any case, the transition does not seem to have harmed his career. He won many awards and was named to the National Academy of Sciences and the National Academy of Medicine.

Barres claims that as a young person, facing all sorts of obstacles, she did not recognize them as stemming from gender discrimination. The experience of changing sex made him much more aware of the prevalence of sexism and its consequences in science. After that he became an advocate for gender equity in science. One way he did this is through public communication, such as the *Nature* article and the

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¹ Ben A. Barres, *Does gender matter?*, *Nature* 442 (2006), 133–136.

² Ben A Barres, *Some Reflections on the Dearth of Women in Science*, video at <https://www.youtube.com/watch?v=Q5La-ZPjJdM>, slides available at <https://slideplayer.com/slide/14054128/>

Harvard lecture mentioned above. In addition, he worked with organizations to change procedures, and he called out instances where women scientists have been excluded or overlooked. Barres does not tell us about these, but Nancy Hopkins gives many examples in her foreword to the book. She says Barres was responsible for changing NIH procedures for the Pioneer Award, changing nomination procedures for Howard Hughes Medical Institute grants, establishing child care assistance for untenured faculty at Stanford, and adopting anti-harassment policies at some scientific conferences. Hopkins shows by example that Barres did not rely on polite persuasion to get his point across. In response to an invitation to speak at a meeting, where of 35 speakers only one would be female, Barres wrote, “You have a hell of a lot of nerve inviting me after sending me that speaker list.” [p. xiii]

Barres also shows his sense of humor. In “Does gender matter?” Barres writes that tests of spatial abilities before and after the testosterone treatment showed an improvement. He jokes, “Alas, it has been to no avail; I still get lost all the time when driving (although I am no longer willing to ask for directions).” He also noticed that people (who didn’t know he was transgendered) treated him with more respect. “I can even complete a whole sentence without being interrupted by a man.”

A significant part of “Some Reflections on the Dearth of Women in Science” is devoted to refutation of Steven Pinker’s writings on cognitive differences by gender, as

found in *The Blank Slate*.³ Barres chose not to repeat these arguments in the autobiography, so I recommend watching the video. He points out that while Lawrence Summers, Steven Pinker and like-minded people admit that individual women can excel in science, they don’t understand that the full participation of excellent women scientists is impeded when “individual merit cannot and will not be recognized in the face of pervasive negative stereotyping.” [p. 113] He lauds the efforts of Nancy Hopkins to expose and correct systematic gender discrimination in salary and resources at MIT and admires her bravery for speaking out. In contrast, he suggests that many women in leadership positions do not fight for gender equality because of fear that such actions “would undermine their leadership authority in the eyes of men.” [p. 114]

Barres was a prolific researcher in neuroscience and an active mentor. The book lists 45 trainees in his lab: PhD students, MD-PhD students, and postdoctoral fellows. Part of his commitment to advocacy work stemmed from the desire to protect the trainees. He reports that a certain 60-year-old neuroscientist bragged that he had slept with 200 women trainees at professional meetings. He worked hard to end this sort of behavior.

Clearly Barres’s impact on science extended far beyond neuroscience and medicine, to making the practice of science better for women and other previously excluded groups. I recommend the autobiography.

³ Steven Pinker, *The Blank Slate: The Modern Denial of Human Nature*, Viking, 2002

CALL FOR NOMINATIONS

2021 Louise Hay Award

The Executive Committee of the Association for Women in Mathematics has established the Louise Hay Award for Contributions to Mathematics Education, to be awarded annually to a woman at the Joint Prize Session at the Joint Mathematics Meetings in January. The purpose of this award is to recognize outstanding achievements in any area of mathematics education, to be interpreted in the broadest possible sense. The annual presentation of this award is intended to highlight the importance of mathematics education and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted. Nominations for members of underrepresented minorities are especially encouraged. The nomination documents should include: a one to three page letter of nomination highlighting the exceptional contributions of the candidate to be recognized, a curriculum vitae of the candidate not to exceed three pages, and three letters supporting the nomination. It is strongly recommended that the letters represent a range of constituents affected by the nominee’s work. Nomination materials for the Hay Award shall be submitted online. See the AWM website at www.awm-math.org for nomination instructions. Nominations must be received by **May 15, 2020** and will be kept active for three years. For more information, phone 401-455-4042, email awm@awm-math.org or visit <https://awm-math.org/awards/hay-award/>.

EDUCATION COLUMN

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

Bringing real-life examples into mathematics: A help or a deterrent

Minerva Cordero, Senior Associate Dean, College of Science and Professor of Mathematics, University of Texas at Arlington, cordero@uta.edu

When I started my first faculty position, one of my colleagues told me the following story. It was December during the week of finals. On his final exam for Calculus I, he had a question on related rates that he wrote using a “well-known” character, Rudolph. It started something like, “Rudolph takes off with an initial angle of 45 degrees and is flying at the rate of 20 mph...” A foreign-born student approached the professor and curiously asked, “Who is Rudolph? The professor explained that Rudolph is one of Santa’s reindeers and he was flying at the given velocity, etc. The student replied, “But reindeers don’t fly.” While at the time I was amused by the seemingly funny story, it stayed in my mind for many years. I would have had the same question as the student had since, when I was growing up in Puerto Rico and completing my undergraduate studies there, Santa was not a regular visitor, as he is nowadays. The instructor’s efforts to make the problem more “friendly” and “accessible” to his students did not have the anticipated effect.

As an instructor I struggled with finding the right “real-life situation” to reframe problems to make them more relevant and interesting to students. Sports are often a common source of examples. While growing up I was very familiar with baseball and basketball; I did not have any experience with (American) football. So problems relating to football appeared rather complicated and foreign to me. However, teaching at a school in Texas they seem like a logical choice. Nevertheless, I chose not to use any examples coming from cultural practices like sports, worrying that some of my students might not be familiar with a particular sport played in the US.

The current discussions on humanizing mathematics and employing “culturally relevant pedagogy” remind me of these and other stories about instructors trying to bring real-life problems and situations into mathematics teaching that sometimes have the opposite effect on students. So, how can we bring “real life” into our teaching while at the same time

being mindful of students’ experiences and circumstances? To me this is a question that begs for our attention if we are truly concerned about helping all students succeed. Mathematics as a subject is not an entity that discriminates against any particular population based on ethnic origin or gender. It is the teaching of the subject that sometimes alienates certain populations. Going back again to my upbringing in Puerto Rico and learning mathematics surrounded by my peers, most of whom were of the same ethnic and socioeconomic level as myself, I can’t help but think that it was not the subject that made the difference of how successful we were with grasping the concepts and learning the subject. But the teaching of mathematics was, and still is, what can make a difference. Presumably the same happens in classrooms in which all/most students share a common heritage (say, in a country in Africa). There we cannot talk about mathematics being elitist or being accessible to only some based on their background or socioeconomic status. However, in the US we talk about “achievement gaps” comparing white students to underrepresented minorities in STEM. At a recent workshop hosted by Excelencia in Education¹ (<https://www.edexcelencia.org/>) I heard the CEO of Excelencia say: “If we were truly educating all students, then we wouldn’t see achievement gaps.”

As associate dean for academic affairs at the University of Texas, Arlington, each semester I get the breakdown of grades for all introductory courses in the college of science. I also receive success rates broken down by ethnicity and gender. I guess it is no surprise that on these courses we also see differences in achievement levels. I am always puzzled by the disparities and wonder what we are missing. It seems clear that the way we are teaching mathematics is accessible and comprehensible to some but not to others. I personally have not experienced this level of achievement discrepancies in my classes, and I cannot help but wonder why.

One of the last courses I taught before becoming a full-time administrator in 2013 was a section of College Algebra with 200 students in Fall 2012. The diversity in my class mirrored the diversity on campus with about 30% Hispanic and 17% African American students. Many of my students were first-generation and came from low socioeconomic status. In many ways they reminded me of a

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¹ Excelencia is a non-profit organization whose mission is to accelerate Latino student success in higher education to address the US economy’s need for a highly educated workforce and for civic leadership.

younger me starting college and I felt a great connection to the class. Typically, on the first day of classes I would tell my students about my upbringing and share with them some of the issues I faced in college in Puerto Rico and also I shared stories about when I came to the United States for graduate school. I asked questions about their background in general, and, without putting anyone in an awkward situation, I learned about the life experiences of my students. I would also ask what their expectations for the class were and what they thought I needed to do to be a successful teacher. This open discussion set a tone of trust in class and I felt that students felt valued.

The class met twice a week with me for 80 minutes. My students were separated into four smaller “lab” sections where they worked with a graduate student on homework problems twice a week for one hour. The passing rate for

my class (82%) was higher than that for any other section that term as well as the historical pass rate, which is about 50%. All homework and tests were the same for all sections of the class. Perhaps the attention given to students’ backgrounds and circumstances at the beginning of the term and throughout the semester, combined with my own experiences learning mathematics in another country, provided an element of realness to the subject that aided students in their learning. I didn’t use examples in class involving Rudolph or Frosty that semester, but whatever examples I employed helped them learn the basics of the subject and move on with their studies.

The question that still remains is: how can we make our teaching of mathematics more inclusive so that more students regardless of their ethnicity or gender can learn the subject? I believe the problem of low success rates in mathematics courses is due to the way we teach it and not to the subject itself. How could it be?

MEDIA COLUMN

In addition to longer reviews for the Media Column, we invite you to watch for and submit short snippets of instances of women in mathematics in the media (WIMM Watch). Please submit to the Media Column Editors: Sarah J. Greenwald, Appalachian State University, appalachianawm@appstate.edu and Alice Silverberg, University of California, Irvine, asilverb@math.uci.edu.

Mean Girls on Broadway

Cindy Lawrence, Executive Director and CEO, National Museum of Mathematics

In late 2018, I had the opportunity to see *Mean Girls* on Broadway. This adaptation of Tina Fey’s cult-favorite 2004 film opened at the August Wilson Theatre in New York City in April 2018 to somewhat mixed reviews. While most of the critics had generally positive comments to make about the show and its cast, some found that it was too long, that it wasn’t as cuttingly funny as the movie, and that the music was somewhat uninspired. Yet, most of the reviewers also recognized that the show was going to be a crowd-pleaser, and having seen the show more than once, I can attest to the fact that it does indeed leave its audiences happy.

When I first saw *Mean Girls* on Broadway, it was only a few months after it had opened. I didn’t have much

recollection of the movie version; my own daughters had been only 8 and 5 when the movie first came out, so it wasn’t an immediate must-see for our family. Perhaps I later saw it on an airplane, or maybe we rented the video when my daughters were a bit older ... in any event, the storyline seemed vaguely familiar to me. Of course, it may also just have been that we’ve all seen movies of this sort: new kid arrives in town and, in an effort to fit in, tries to be something he or she is not. He or she then struggles through some sort of problem, the problem reaches crisis proportions, and the protagonist ultimately realizes that it’s best to be true to oneself. Perhaps it’s a trite storyline, but for anyone who has struggled through the social jungle of secondary school and survived (isn’t that all of us, in some way?), the story resonates. After all, who doesn’t love an ending where good triumphs over evil, even if good takes the form of a group of stereotypically nerdy outcasts while evil is represented by the popular (and sometimes cruel) crowd called the “Plastics.”

As it happens, I ended up in this show almost randomly, with a visiting-from-out-of-town mathematician friend who identified *Mean Girls* as one of only two options with decent seats available for our last-minute purchase. It wasn’t necessarily high on my list to see, but it seemed harmless enough, and I looked forward to some lighthearted, feel-good entertainment.

As the Executive Director and CEO of the nation’s only Museum of Math (momath.org), my ears are far more attuned to math references than they may have been when I

first saw the movie years ago. As I sat in the theatre, I enjoyed the fact that Cady Heron, the leading character, was taking a challenging calculus course. And I liked even more that she wasn't just taking it, she was rocking it. Yay, Cady! I loved having the audience, replete with many young teens and tweens, see that the leading lady, played by the charismatic and talented Erika Henningsen, was taking—and acing—a high level math class.

Of course, I was somewhat less pleased when the plot turned a bit, and Cady tried to hide her mathematical talents in an effort to command more attention in the form of “help” from Aaron, a young athlete on whom she'd developed a crush. (And I will admit, I also found myself recalling with some unease having once tried something similar, although I was significantly less successful than Cady at this endeavor, mostly because I couldn't help myself from enthusiastically explaining the interesting nuances of every problem to the young man in question.)

The show proceeded through its paces, with occasional up-and-down references to mathematics throughout. One song had Cady singing this:

*I decided I would be a mathematician
'Cause math is real*

My mathematician friend and I exchanged knowing smiles. What a great lyric! I can't recall another movie or play in which a young, modern heroine sings about how she wants to be a mathematician. What a great moment in Broadway history!

But then, moments later, Cady continues:

*I memorized a lot of pi
Because additions and subtractions and division*



Cindy Lawrence, MoMath; cast members Erika Henningsen, Cheech Manohar, Iain Young, and Chris Medlin; audience of 7th and 8th graders

*Would never make me feel
So stupid with love*

Math as memorizing a bunch of digits? Math reduced to basic arithmetic operations? Math as a substitute for love?! I looked around me in the darkened theatre, hoping that none of the young women present were listening too closely to the lyrics.

The song continued:

*So, thank you math for being there
To bring me joy*

continued on page 30

CALL FOR PROPOSALS

Research Collaboration Conferences for Women

Supported by a National Science Foundation ADVANCE grant, the AWM is working to establish and support research networks for women in all areas of mathematics research. As part of the grant, the AWM will provide mentorship and support to new networks wishing to organize a research collaboration conference for women (RCCW), including: help finding a conference venue, help developing and submitting a conference proposal, and help soliciting travel funding for participants.

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.

Deadline for submission: **July 1, 2020.**

More information about the ADVANCE Grant, Research Collaboration Conferences for Women, existing RCCW networks, and related initiatives can be found at <http://awmadvance.org/>.

A Broadway show mentioning the joy of math?! Another high five in the dark. But then...

And thank you math

'Cause now [you] brought me this cute boy

Uh oh. Not where I was hoping the song would go....

The play continued, and if there were more direct references to math, I didn't hear them as I got caught up in the storyline. Watching Cady learn how to maneuver her way through the political and social world of an American high school, and seeing how her "success" in this endeavor turned her into a very different—and less likable—sort of person, was fascinating even as it was predictable. I knew that somehow she would come around by the end of the show, that there would be the expected moral to the story, and that we were probably getting ready for a feel-good, happy ending.

But what I didn't expect was how the ending played out. As Cady begins to return to her true self, she is recruited to join the Mathletes team, which makes it to the state championships. I loved that Cady was not only on the team; she was the star of it. When the score was tied and the championship came down to a final question, it was Cady, and not any of her male teammates, who was selected to represent the team. And while I don't think the plot would have suffered overly if the opposing team representative had been male, it happens that the competing team also put forward a female representative. What a *great* moment (thank you, Tina Fey), to see that the top two competitors from the top two teams in the state were both young women.

And what a greater moment because the show didn't make a big deal of this; it was presented matter-of-factly, and not as unusual or unexpected in any way.

And then, it came down to the final, tie-breaking question of the competition: a real math question!

$$\lim_{x \rightarrow 0} \frac{\ln(1-x) - \sin x}{1 - \cos^2 x}$$

When Cady blurts out the answer, "The limit does not exist!"—a line made famous by the movie—I could barely restrain myself from leaping out of my seat and fist-pumping my friend (I didn't do it...but I wanted to!) as I excitedly exclaimed, "This is such a *math* show ... math saves the day ... a young *girl* doing math saves the day...."

The emotional high around the ending was so thrilling that I was even able to forgive the creators for their occasional questionable lyrics and behavior. And I'll bet more than a few young girls (and boys) in the audience went home that night to read up on the final, tiebreaking problem, and maybe a few of them even learned something about limits, divergence, or L'Hôpital's Rule. The ending was truly inspirational for all, but especially, I think, for the young women in the audience.

I left the theater vowing to my friend that I was going to reach out to the producers of the show and find a way to connect. And sure enough, connect we did. I was delighted when four of the cast members, Erika Henningsen (Cady Heron), Cheech Manohar, Iain Young, and Chris Medlin (Mathletes team members) came to MoMath to host a discussion with a visiting group of 7th and 8th grade students. Erika talked about the importance of being yourself, and of not being afraid to do what you love, even if it doesn't make you popular in school. It resonated with these young students to hear a successful Broadway star talk about how the other kids in her school didn't love singing and acting the way she did, and how sometimes that made her feel different or excluded. Cheech jumped in to explain that he really was a Mathlete, and that he loved math, and that sometimes he too felt like his classmates didn't really understand his love of math. All the cast members reiterated to the students that they should be themselves and pursue whatever it is that they love best; it was a heartwarming message.

A few months later, we connected with *Mean Girls* again, this time taking a group of families, primarily with teen and tween daughters, to Broadway to see the show and then have a post-performance discussion in the theatre with some of the cast members, including Kate Rockwell, who played Karen Smith in the show. The math message of the show seemed to resonate with the young women who joined us that evening; they also enjoyed having a chance to talk with some of the stars.

In summary, *Mean Girls* is a feel-good show with an uplifting storyline and a mostly positive message about math and about women in math. (Did I mention that even the calculus teacher is a woman?) If you find yourself in New York City and want to see a show that will amuse, entertain, and leave you feeling good about math and about women in math, *Mean Girls* is the show for you.

AWM Workshop at the 2021 Joint Mathematics Meetings

Application deadline for graduate students: August 15, 2020

For many years, the Association for Women in Mathematics has held a series of workshops for women graduate students and recent PhDs in conjunction with major mathematics meetings. Beginning in 2016, the workshop talks are supported by the AWM ADVANCE grant. The AWM Workshops serve as follow-up workshops to Research Collaboration Conferences for Women, featuring both junior and senior women speakers from one of the Research Networks supported by the ADVANCE grant. An AWM Workshop is scheduled to be held in conjunction with the Joint Mathematics Meetings in Washington, DC, January 2021.

FORMAT: The workshop will consist of a Special Session focused on Analysis and PDEs organized by Danielli Donatella and Irina Mitrea and a Poster Session for graduate students. Selected junior and senior women from the Research Collaboration Conferences for Women (RCCW) WoAN, which was held at BIRS in June 2019, will be invited to give 20-minute talks in the Special Session on Women in Analysis and PDEs. The speakers will be supported by the National Science Foundation AWM ADVANCE grant: Career Advancement for Women Through Research Focused Networks. The Poster Session will be open to all areas of research; graduate students working in areas related to Analysis and PDEs are especially encouraged to apply. The graduate students 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 mathematicians at all stages of their careers. In particular, graduate students in analysis and PDEs will have the opportunity to connect with the Women in Analysis and PDEs (WoAN) Research Network.

All mathematicians (of any gender) 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.

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, 2020**.

ELIGIBILITY: To be eligible for selection and funding, graduate students must have made substantial progress towards their theses. Women with grants or other sources of support are welcome to apply. All non-US citizens must have a current US address.

All applications should 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 thesis advisor.

Applications (including abstract submission via the Joint Mathematics Meetings website) must be completed electronically by **August 15, 2020**. See <https://awm-math.org/meetings/awm-jmm/> for details.

ANNOUNCEMENTS

AWM-MAA Liaisons

Shanna Dobson, newly elected chair of the AWM-MAA Liaison Committee, tells us: I am excited to announce its re-initiation, the vision of which is to establish a regional presence for AWM to support women in mathematics at all levels of the profession. Locally, we have negotiated a partnership with the Mathematical Association of America to work with MAA Sections around the country. Through this partnership, we hope to increase opportunities for women to meet and build community at MAA Section meetings, to be well-represented among the invited speakers, and to support their students through opportunities for student participation. By adapting techniques from inclusive pedagogy, we will organize AWM activities at MAA Section meetings that explicitly model equity and inclusivity and thereby charter the movement of inclusion in all communities. If serving as an MAA Liaison is of interest to you, please contact me at liaisons@awm-math.org. I look forward to hearing from you!

Symposium in Honor of Julia Robinson's 100th Birthday

The Mathematical Sciences Research Institute hosted a Symposium on the occasion of Julia Robinson's 100th birthday on Monday, December 9, 2019. Julia Robinson (1919–1985) was an internationally renowned logician of the twentieth century. She was a trailblazer in mathematics as well as in many other ways: she was the first woman president of the American Mathematical Society, and the first woman mathematician elected to membership in the National Academy of Sciences.

Robinson was a long-time friend of AWM who was the 1982 Noether Lecturer. She was honored in 1996 by the Julia Robinson Celebration of Women in Mathematics Conference, organized by AWM and held at MSRI.

Videos from the 2019 symposium are now available on the web. They include the talks of the participating speakers Martin Davis, Kirsten Eisenträger, Yuri Matiyasevich and Lou van den Dries and the public lecture given by Lenore Blum. A DVD may also be purchased. See <http://www.msri.org/workshops/955>.



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June 29 – July 3, 2020
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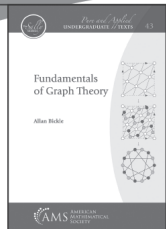
<http://math.bu.edu/keio2020>

Talks aimed at the advanced graduate student level
Funding available, pending NSF approval; women encouraged to apply

TITLES OF INTEREST

from the AMS

◆ = Textbook



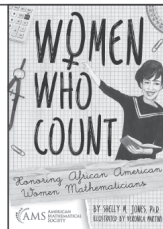
Fundamentals of Graph Theory ◆

Allan Bickle, *Pennsylvania State University Altoona, PA*

Graph theory is a fascinating and inviting branch of mathematics. Many problems are easy to state and have natural visual representations, inviting exploration by new students and professional mathematicians. The goal of this textbook is to present the fundamentals

of graph theory to a wide range of readers. The book contains many significant recent results in graph theory, presented using up-to-date notation.

Pure and Applied Undergraduate Texts, Volume 43; 2020; 336 pages; Hardcover; ISBN: 978-1-4704-5342-8; List US\$85; AMS members US\$68; MAA members US\$76.50; Order code AMSTEXT/43



Women Who Count

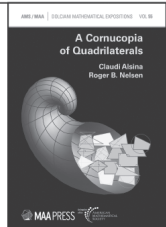
Honoring African American Women Mathematicians

Shelly M. Jones, *Central Connecticut State University, New Britain, CT*

Women Who Count: Honoring African American Women Mathematicians is a children's activity book highlighting the lives and work of 29 African

American women mathematicians. Although the book is geared toward children in grades 3–8, it is appropriate for all ages.

Women Who Count, 2019; 138 pages; Softcover; ISBN: 978-1-4704-4889-9; List US\$15; AMS members US\$12; MAA members US\$13.50; Order code MBK/124



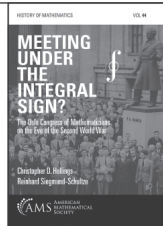
A Cornucopia of Quadrilaterals

Claudi Alsina, *Universitat Politècnica de Catalunya, Barcelona, Spain*, and Roger B. Nelsen, *Lewis & Clark College, Portland, OR*

A Cornucopia of Quadrilaterals is suitable for serious study, but it equally rewards the reader who dips in randomly. It contains hundreds of challenging four-sided problems. Instructors of number theory, combinatorics, analysis, and

geometry will find examples and problems to enrich their courses.

Dolciani Mathematical Expositions, Volume 55; 2020; 304 pages; Hardcover; ISBN: 978-1-4704-5312-1; List US\$59; AMS members US\$44.25; MAA members US\$44.25; Order code DOL/55



Meeting under the Integral Sign?

The Oslo Congress of Mathematicians on the Eve of the Second World War

Christopher D. Hollings, *Mathematical Institute and Queen's College, University of Oxford, Oxford, UK*, and Reinhard Siegmund-Schultze, *University of Agder, Kristiansand, Norway*

This book examines the historically unique conditions under which the International Congress of Mathematicians took place in Oslo in 1936. This Congress was the only one on this level to be held during the period of the Nazi regime in Germany (1933–1945) and after the wave of emigrations from it.

History of Mathematics, Volume 44; 2020; 362 pages; Hardcover; ISBN: 978-1-4704-4353-5; List US\$120; AMS members US\$96; MAA members US\$108; Order code HMATH/44

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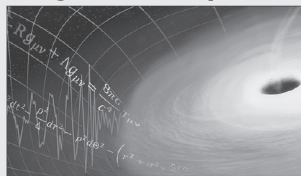
Advances in Computational Relativity

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Full details can be found at:
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Association for Symbolic Logic Student Travel Awards

The ASL offers modest student travel awards through its NSF grant to graduate students in logic to attend its annual meetings in North America and Europe. These awards are available to US citizens and permanent residents as well as to international students enrolled at US universities. You do not need to be an ASL member to apply for these awards. Air travel paid for with NSF funds must be in compliance with the Fly America Act.

The next two ASL meetings for which funding is available are the **2020 Logic Colloquium** (July 13-18, 2020 in Poznan, Poland) and the **2021 Annual North American Meeting** (May 18-21, 2021 at the University of Notre Dame). Details for applying for student travel awards for these conferences will be posted at <https://aslonline.org> when they become available.

The ASL also offers student travel awards to **ASL-sponsored meetings**. These awards are open to all ASL student members. For a full list of ASL-sponsored meetings, see <https://aslonline.org>. Applications must be sent to the ASL Office at asl@uconn.edu at least three months before the start of the sponsored meeting.

To be considered for a travel award for any of these meetings, please ask your thesis supervisor to send a brief recommendation letter. You must also submit a brief (1 page) letter of application that includes: (1) your name; (2) your home institution; (3) your thesis supervisor's name; (4) a one-paragraph description of your studies and work in logic; (5) a paragraph indicating why it is important to attend the meeting; (6) your estimate of the travel expenses you will incur; (7) (for citizens or residents of the USA) citizenship or visa status; and (7) (optional) an indication of your gender and minority status. Women and members of minority groups are strongly encouraged to apply.

ASL, Department of Mathematics, University of Connecticut
341 Mansfield Road, U-1009 Storrs, CT 06269-1009
Email: asl@uconn.edu **Phone:** (860) 486-3989
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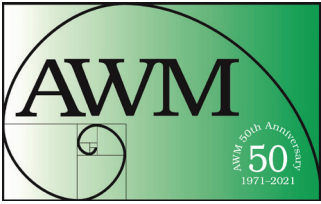
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