ASSOCIATION FOR WOMEN IN MATHEMATICS

Newsletter

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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.

IN THIS ISSUE

PRESIDENT'S REPORT

My message in this newsletter is about difficult choices. For almost 50 years the AWM has been the champion of women in mathematics of all kinds and at all different levels. Our mission has not changed: 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. But we have come to recognize more ways that we can support this mission. We have come to recognize that to be a woman in math does not mean just one thing. Women in math are researchers, we are educators, we work for government labs, we work in industry. Women in math are married, have children, are lesbians, are genderqueer, are transgender, are single, are childless, are in relationships with other mathematicians. Women in math are Asian, are black, are Latina, are of a native people, are white. Women in math knew they loved math and were good at it since grade school and others come to it later after meandering paths. I recognize and apologize that none of these lists is extensive enough. And many of us are combinations of these labels that may change over time.

The AWM was founded in 1971 by a strong group of women who sought a seat at the table, the right to develop their mathematical talents and be rewarded just as men were. Over the years the AWM has developed programs for women and girls at many levels and we continue to strive for inclusivity along every axis: essay contests, undergraduate prizes, thesis prizes, field specific prizes, travel grants, research networks, education committees, policy and advocacy action, publications, panels and workshops and conferences. Each of these requires tons of volunteer time and paid staff time to support the volunteers. We do a lot, in many ways we don't do enough…. Oh how I wish we could award more travel and mentoring grants to all the highly qualified applicants!

When I accepted the nomination for AWM president, I thought my time would be filled thinking about new ways to support all women in math, opining about current issues, urging the mathematics community to rethink its ways for a more inclusive future. While I have done some of that, the bulk of my AWM energy needs to be spent thinking about how to continue to do everything we do.

We have wonderful paid staff, our Executive Director Karoline Pershell and Managing Director Steven Ferrucci work tirelessly on our behalf. They provide our countless committees with information and support and gently nudge our generous volunteers when deadlines loom. They are overworked and undercompensated. And that is a practice that is unsustainable and unacceptable. For the last two years the AWM has hired the AMS to manage our administrative matters. They have generously gifted us more time then we have paid for. Without a

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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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significant increase in our financial resources we can no longer continue to mount all the programs we currently run, and we are in the depressing state of being unable to try exciting new ideas. As a community we need to change this situation.

I am not writing this piece to ask for your money (though AWM would be happy to have that). I am writing to ask your help in making the difficult choices. What is critical for all women in all of math in 2020? What should we focus on, and what can we put on the back burner? I have great optimism that this smart resourceful community will come together with great ideas for revamping programming and increasing resources. Hey, if women can win the Fields Medal and Abel Prize, we can do this too!

I look forward to hearing your thoughts and working with our community.

Ruth Haas

Ruth Haas
September 22, 2019
Mānoa, HI

AWM Election

This year, we are electing a President-Elect, a Treasurer, and four Members-at-Large of the Executive Committee. The Member-at-Large positions are contested, so we encourage you to vote. Statements, biographical data, and photos provided by the candidates follow. Those elected will take office on February 1, 2020.

On or about November 4, 2019, eligible voters will receive an email inviting them to vote. At that time the electronic ballot link will be activated. If you do not receive the email, contact Managing Director Steven Ferrucci at steven@awm-math.org or 401-455-4042. Also, a ballot is included on page 11 of this issue, for those who prefer to vote the old-fashioned way. A validating signature is required on the envelope if you vote via paper ballot. Institutional, affiliate, and corporate memberships do not carry voting privileges. Electronic ballots must be cast by **December 1, 2019**, which is also the due date for paper ballots.

PRESIDENT-ELECT

Kathryn Leonard, Occidental College

Statement: It's a distinct honor and pleasure to be nominated for President of the Association for Women in Mathematics, following in the footsteps and benefitting from the service of a long line of distinguished women who support and promote other women. Indeed, I would not have found professional fulfillment and success without a whole team of people, many of whom are women, who gave

me a hand when I needed one. I look forward to offering my hand likewise as AWM President.

AWM is a rare professional society that equally values research, teaching, and service, where people who have taken divergent pathways in mathematics work together to strengthen the whole mathematical community. Building on the work of previous presidents and the AWM community, I am excited to continue AWM's strong programs engaging girls in math, repairing the leaky pipeline, supporting women in research, fighting sexual harassment and other workplace issues, and striving for a community of true inclusivity.

Kathryn Leonard

When I feel dismayed at the continued stories of obstacles facing women in the mathematical sciences, I remind myself of the progress made by organizations like AWM. Many colleges and universities only began admitting undergraduate women in my lifetime. Family policies now exist almost everywhere. Women are being recognized with top prizes for their excellent work in research and teaching. The headway AWM has made leading to today's vibrant professional community of female mathematicians is substantial and encouraging. But there is more to be done, particularly for women with other marginalizing identities. The need for support and advocacy remains as strong and real as ever, and we can only make progress through sustained and focused effort.

I am especially interested in matters of:

- Diversity, where AWM works to advocate for and represent in its governance the entire range of its constituency, along socioeconomic, ethnic, (inter)national, and gender axes;
- Integration, where AWM not only creates networks and supports for its members, but also facilitates their active, real participation in the broader professional mathematical community as equal partners;
- Safety in the workplace, where AWM leads the charge to keep all mathematicians free from sexual harassment, bullying, and other workplace aggressions;
- Promotion, where AWM continues to fight against the effect of implicit bias on prizes, grants, and other forms of professional recognition;
- K–12 engagement, where American girls may maintain their interest and live up to their potential in mathematics, contributing to the growth of our community in step with their international sisters; and
- Top-level representation, where the upper ranks of academia, industry, and government recognize and welcome the many talented women doing exceptional work.

I hope that in making an active effort along these fronts, I may give back to a community I believe fiercely in, and move us closer to a time when such work is no longer necessary.

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

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
$5000+
$2500–$4999
$1000–$2499

Print Subscriptions and Back Orders—Regular and contributing members living in the US may elect to receive a print version of the *Newsletter.* Libraries, women's studies centers, non-mathematics departments, etc., may purchase a subscription for $75/year. Back orders are $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 Emily Sergel, esergel@math.upenn.edu. Send everything else, including ads and address changes, to AWM, awm@awm-math.org.

Biographical information: Kathryn Leonard is Professor and Founding Chair of Computer Science at Occidental College. Before that, she was a member of the Mathematics Department and Director of the Center for Interdisciplinary Studies at CSU Channel Islands, the newest member of the Cal State system. She completed a postdoctoral fellowship in the Applied and Computational Mathematics department at Caltech after finishing her PhD in Mathematics at Brown University. She is the director of the NSF-funded Center for Undergraduate Research in Mathematics, which received the 2015 Programs that Make a Difference award from the AMS. She received a 2013 Henry L. Alder Award for Excellence in Teaching from the MAA and an AWM Service Award in 2015. She previously served on the AWM Executive Committee as chair of the Meetings Portfolio. She is a member of the Oversight Committee for AWM's ADVANCE grant, serves as chair of its Research Networks Committee, and is on the leadership teams of the Women in the Science of Data and Mathematics (WiSDM) and Women in Shape Modeling (WiSH) Research Networks. Her research interests are in geometric modeling for computer vision and computer graphics, and she has coedited two Springer volumes in that area. She is a coauthor with actor Misha Collins, who plays Castiel on the TV show *Supernatural*.

TREASURER

Mary Shepherd, Northwest Missouri State University

Mary Shepherd

Statement: It is an honor and a privilege to be considered for the position of Treasurer of the AWM. Who knew that the accounting degree and my work as an accountant many years ago before pursuing a PhD in mathematics would find a way to be of service in my mathematics life. I have been a member of AWM since receiving my PhD. I chose to be a member to support other women in mathematics in general and those particularly who might follow in a less traditional career trajectory in mathematics, as I have. As Treasurer it will be an opportunity to work for the financial health of the organization and help continue the good work that has been started in its nearly 50 year history.

Biographical information: Mary Shepherd is Professor of Mathematics at Northwest Missouri State University where she has been since 2001. Currently, she is on sabbatical and is a Visiting Professor at Arizona State University. Her research interests started in differential geometry and have continued into undergraduate mathematics education, particularly in reading mathematics where she has several publications. She has also worked in mathematics as created in needlework where she has chapters in three books. She earned an undergraduate degree in music performance (clarinet) from Missouri State University in 1976, a Masters

ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM ONLINE

The *AWM Newsletter* is freely available online.

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

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

Media Coordinator
Marie Vitulli, vitulli@uoregon.edu

AWM DEADLINES

AWM Workshop at SIAM:
January 2, 2020
AWM Travel Grants:
February 1 and May 15, 2020
AWM Essay Contest: February 1, 2020
AWM Mentoring Travel Grants:
February 1, 2020
AWM-Birman Research Prize:
February 1, 2020
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

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of Accountancy from the University of Oklahoma in 1987 and a Masters and PhD in Mathematics from Washington University in St. Louis in 1996. She initially taught at SUNY–Potsdam from 1996 to 2001. She is a Project NExT fellow (Peach Dot–1997) and helped found the Missouri Section NExT program. She has been Secretary/Treasurer, Chair, and Governor/Section Representative of the Missouri Section of the MAA. She has also served on the EC of the MAA as the Budget and Audit member (2008–2010) and after reorganization of the MAA EC, continued to serve as the appointed person on the Audit Committee of the Board of Governors until 2018. Mary is currently a member of the CTUM Committee of the MAA and was involved with the writing and publication of the *Instructional Practices Guide of the MAA*. Prior to returning to school to pursue mathematics, she was an accountant at various private companies, most recently at Hertz Rent-A-Car. She passed the CPA exam in 1987.

MEMBER-AT-LARGE

Linda Chen, Swarthmore College

Statement: I am honored to be nominated as a candidate for Member-at-Large of the AWM Executive Committee and I am enthusiastic to serve. On a personal level, I am fortunate to have had mentorship from many women mathematicians at crucial stages of my career. As I have progressed in my life as a researcher and educator, I have tried to similarly ensure that the next generation of women mathematicians receives opportunities and support. AWM organizes important activities such as research sessions and symposia which highlight the research of members of our community and provide valuable opportunities for networking. In addition to working on AWM programs that recognize outstanding achievements and inspire other women, as a member of the Executive Committee, I would support AWM initiatives to support diversity in the mathematical sciences, especially the participation and retention of underrepresented groups. I would be privileged to serve the community of women mathematicians and to help shape the future of AWM.

Biographical information: Linda Chen is an Associate Professor of Mathematics and Statistics at Swarthmore College. Prior to joining Swarthmore College in 2008, she held positions at Columbia University and the Ohio State University. She was a Program Director at the National Science Foundation in the Topology and Geometric Analysis programs from 2011 to 2013. Her research interests are in algebraic geometry and algebraic combinatorics. Her research program has been funded by individual National Science Foundation grants and a Simons Foundation Collaboration Grant.

Linda Chen

She has served on several AMS committees, including the Nominating Committee, the Selection Committee for the Dolciani Prize for Excellence in Research, and the Committee on Academic Freedom, Tenure, and Employment. In addition, she is currently an Associate Editor for the *American Mathematical Monthly* and has been a co-organizer and scientific committee member of national and international conferences, including the Formal Power Series and Algebraic Combinatorics (FPSAC) Conference, workshops at MSRI, the annual Mid-Atlantic Algebra, Geometry, and Combinatorics (MAAGC) workshop, and special sessions for AWM Research Symposiums and AMS Sectional Meetings. She has been a mentor and lecturer for several Women and Mathematics Programs at the Institute for Advanced Study and has met with legislative staff on Capitol Hill as part of an AWM Hill Visit. She enjoys working with girls and women in mathematics at all levels, ranging from running junior math circles for elementary school students to serving as a group leader for the Women in Algebraic Geometry Collaborative Research Workshop at ICERM in 2020.

Carla Cotwright-Williams, Department of Defense

Statement: It is a great honor to be considered and nominated for Member-at-Large of the AWM Executive Committee. If elected, I will bring a unique perspective to the committee having transitioned from academia, through

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Carla Cotwright-Williams

industry and government. I believe my experiences and ideas will help resonate with existing members and draw in new members creating a new synergy for women across the broadening world of women in mathematics.

Biographical information: Dr. Carla Cotwright-Williams works with the Department of Defense (DoD) on a 12-month detail with the Joint Artificial Intelligence Center (JAIC) as the Acting Chief of Data & AI. Prior to working with the DoD, she began her public service in academia—serving over 10 years in research and teaching. She has conducted research with both NASA and the U.S. Navy.

She was the 2012–2013 American Mathematical Society (AMS) Congressional Fellow. During her time on Capitol Hill, she worked as a staffer on the majority staff of the U.S. Senate Homeland Security and Governmental Affairs Committee and a House personal office.

She has served as the 2015 Hardy-Apfel Information Technology (IT) Fellow at the U.S. Social Security Administration in Baltimore, MD. As an IT Fellow, Cotwright-Williams worked on a variety of high-profile IT projects including creating fraud analytics in the Office of Anti-Fraud Programs and the launch of SSA's cloud infrastructure (Enterprise Data Warehouse (EDW)) whose primary goal is to improve accessibility to a critical asset, its data.

Cotwright-Williams has been an invited speaker and panelist across the nation speaking to diverse audiences about her research, career transitions, and mentoring. Cotwright-Williams holds a PhD in Mathematics and serves as the Outside Academia Representative for the National Association of Mathematicians.

She has received a 2019 Women of Color STEM Award for Outstanding Technical Contributions in Government.

Donatella Danielli, Purdue University

Statement: I am honored to have been nominated to serve as a Member-at-Large of the Executive Committee of the AWM. I would not have been able to pursue a career in mathematics (while raising four children) without the tremendous support I received from my husband, thesis advisor, mentors, and colleagues. Motivated by my own experiences, and by the awareness of the many different challenges that women face at all stages of their professional paths, I have strived to build a sense of community for female mathematicians since I became a faculty member.

Donatella Danielli

My approach is threefold: (i) present positive role models; (ii) encourage young women to follow their dreams of careers in mathematics; and (iii) provide mentoring, moral support, and when possible, fellowship support to encourage retention and facilitate success. In 2007 I created, and have co-organized since, the Women in Mathematics Day at Purdue, an annual event of the department aimed at improving the climate for women graduate students and faculty. I have served as Faculty Sponsor of the AWM Student Chapter at Purdue since its inception in 2011. I have coordinated a regional EDGE mentoring group for women graduate students and junior faculty at Midwest institutions,

and I am a faculty mentor for the federally funded program HORIZONS, which is designed to assist low-income and first-generation students succeed at Purdue. I have served on various AMS and AWM committees. For the AWM, I have served on the Ruth I. Michler Memorial Prize and the Mentoring Grant committees, and I am currently co-editing the Proceedings of the 2019 AWM Research Symposium. I have co-organized several conferences aimed at showcasing the work of women and underrepresented minorities, and I have recently founded, with Irina Mitrea, the AWM Research Network for Women in Analysis. If elected, I look forward to broadening the scope of my efforts to make the mathematical community more inclusive for all underrepresented groups.

Biographical information: Donatella Danielli is a Professor of Mathematics at Purdue University. She received a Laurea cum Laude in Mathematics from the University of Bologna, Italy, in 1989. She completed her doctorate in 1999 at Purdue University under the supervision of Carlos E. Kenig. Prior to joining the Purdue faculty in 2001, she held positions at The Johns Hopkins University and at the Institut Mittag-Leffler in Sweden. She was also a Visiting Fellow at the Isaac Newton Institute in Cambridge, UK, in 2014. Her research is in the areas of Partial Differential Equations, Calculus of Variations and Geometric Measure Theory, with specific emphasis on free boundary problems arising from physics and engineering. She was the recipient of an NSF-CAREER Award in 2003. She was awarded a Simons Foundation Fellowship in Mathematics in 2014. In 2017 she became a Fellow of the American Mathematical Society "for contributions to partial differential equations and geometric measure theory, and for service to the mathematical community."

Elena Fuchs, UC, Davis

Statement: The first time I heard about AWM was in my senior year in college, when I was named a runner-up for the AWM Alice T. Schafer prize. At that point, I had never had a female professor (and have not, to this day), and to me it was such an internalized norm that I didn't even stop to think about it. That year, I attended the 2005 Joint Mathematics Meetings in Atlanta where, thanks to AWM, I got to meet many older women in mathematics, including Ingrid Daubechies, who was there giving the AMS Gibbs Lecture. I remember sitting in the audience during her talk, which she started by sharing how she often feels like she is actually a "fake" mathematician, and that each time she gives a talk, she worries that this will be the time everyone else will discover she is a fake. This was such a pivotal moment for me, when I realized that a) I am not alone in feeling like I am a fake, that I do not belong in the math world, despite any of my achievements, and b) that while a woman who so clearly is an amazing mathematician can feel this way, she is also smart enough to see past that and courageous enough to admit it to a packed auditorium of (mostly male) colleagues. As I went on to graduate school, then a postdoc, and then two tenure-track positions, AWM has remained an ever present pillar of support for me, always reminding me that I am NOT alone, that I DO belong, and, no matter my feelings, I am not actually a fake. At another Joint Mathematics Meetings, I attended a special session in which only women presented their work: this was another empowering moment for me, when I realized that I am a lot more comfortable and confident in talking about my work when there are many other women around. It encouraged me to seek out opportunities to collaborate and work with female mathematicians, which has led to some of not only the most enjoyable, but also the most interesting, work I have done in my career. As I have progressed in my career, I have become increasingly more interested and involved in supporting younger female mathematicians myself, since I know how lucky I was to have had access to such support throughout my years as a mathematician. As I have participated on various grant panels and departmental committees, I have also become more and more aware of how much work there is to be done to make mathematics an inclusive world for everyone, not just women who look like me, but also women of color and other

Elena Fuchs

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AWM ELECTION *continued from page 7*

underrepresented groups. I have been honored to serve on the AWM Awards Committee over the past two years where this issue was discussed at length, and through which I met several women of color in math who have taught me so much. I am truly honored and excited about the prospect of serving on the AWM Executive Committee. If elected, I would serve to the best of my abilities to continue AWM's work in helping female mathematicians at all stages of their career. I would also work hard to continue the work AWM has begun in making the group more inclusive and supportive of women of color, trans women, and other underrepresented groups, who I know are even more isolated than I have been throughout my own career.

Biographical information: Elena Fuchs is an Associate Professor in the Department of Mathematics at the University of California, Davis. She received her BA in mathematics from UC Berkeley in 2005 and her PhD in mathematics from Princeton University in 2010, advised by Peter Sarnak. She then held postdoc positions at the Institute for Advanced Study and at UC Berkeley, and a tenure track position at the University of Illinois at Urbana-Champaign before moving to her dream university (UC Davis) in 2016. Her research is in number theory, at the intersection of analytic number theory, geometric group theory, and dynamical systems. She is a 2016 Sloan Research Fellow and has also been funded by the NSF. She has been a plenary speaker at several major research conferences and has presented her work at dozens of mathematics seminars and conferences, both within the US and internationally.

Fuchs is also committed to outreach and service. At UC Davis, she founded M-PACT, a program connecting the UC Davis mathematics department to Smythe Academy, a middle school in an extremely impoverished and underprivileged school district in Sacramento. This program brings a group of UC Davis mathematics students and faculty (including Fuchs herself) to the school on a weekly basis, not only to show the Smythe students a side of math that they do not have access to at school through games and hands-on activities, but also to form connections between the middle schoolers and people at UC Davis. The program also has a mentoring aspect to it, where middle schoolers are invited to the UCD campus to meet UCD undergraduates who are first generation students coming from situations that are similar to their own. Both within and outside of her university, Fuchs has always been involved with efforts to make mathematics more inclusive of women. She has organized and participated in several conferences and workshops aimed at women, some of which were backed by AWM, and some by WIN (Women in Numbers). From 2017–2019, she served on the AWM Awards Committee. She is also a mother of two wonderful children, born in 2013 and 2018.

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 us at 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**.

Gretchen Mathews

Gretchen Mathews, Virginia Tech

Statement: I am honored to be considered for a position on the AWM Executive Committee. AWM's efforts have positively impacted the careers of many, and I will work to ensure that they reach out to be as inclusive as possible. Mathematics as a discipline should be a place where not only all are welcome but also everyone can thrive. Much of my career has been devoted to creating programs to encourage students at all levels to enter and persist in the STEM pipeline, especially women and those from groups traditionally underrepresented in mathematics. These include summer camps for young women to support structures and intentional early research engagement for undergraduates and graduate students to collaborative research opportunities for junior faculty. They are designed to broaden views of what success in mathematics looks like and to equip participants with skills and strategies to be more successful and joyful in their mathematical pursuits. Barriers to participation and advancement exist and will perpetuate if simply ignored. AWM provides strength in numbers as well as programs to address some of them. For instance, the AWM Student Chapter of which I was a founding co-advisor continues to move the needle and equip its members to do so as well. Currently, I am chairing the AWM Scientific Board, whose goal is to facilitate nominations of women for prizes, awards, society fellows, and other honors within mathematics and the mathematical sciences. I look forward to seeing more women recognized for their accomplishments.

Biographical information: Gretchen Matthews is a Professor of Mathematics at Virginia Tech, joining the faculty there in 2018. Prior to that, she was a Professor of Mathematical Sciences at Clemson University. Currently, Matthews is Director of the Commonwealth Cyber Initiative in Southwest Virginia and on the faculty of Virginia Tech's Hume Center for National Security & Technology as well as the Computational Modeling & Data Analytics Division in the interdisciplinary Integrated Academy of Science. Her research is in applications of algebraic geometry, especially to coding theory, cryptography, and data storage. She is on the Editorial Board of *IEEE Transactions on Information Theory*. She currently serves as Chair of the MAA Committee on Participation of Women and is a member of the AMS Committee on Professional Ethics. Previously, she has served on the AWM Michler Prize Selection Committee and the AWM Long-range Planning Committee. She enjoys creating hands-on activities which immerse K–12 students in mathematics beyond the standard curriculum, especially concepts from coding theory, cryptography, and data storage, and involving graduate students in the process.

Michelle Snider

Michelle Snider, IDA/Center for Computing Sciences

Statement: Over the almost 50 years since the AWM was founded, the mathematical cultural landscape has greatly improved. Now, in addition to having more women in math at all levels, there is much broader awareness and

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support of diversity, discussions about the leaky pipelines, and reporting mechanisms for harassment. However, the issues which remain are pervasive and sneaky, in conscious and unconscious biases, and in cultural and societal messages that start as early as elementary school and persist throughout our careers. Subtle and not-so-subtle cues tell us how a mathematician "should" look, act, be. Sometimes we all need to be reminded that we do belong here.

Throughout my efforts in the AWM, I have sought to expand our community and to support an ever-broadening spectrum of mathematicians. I love taking groups of students and faculty and professionals from industry, government, and academia to Capitol Hill—these events give us a chance to meet with our elected officials and share with them the problems that we face and how they can help. But, more than that, I relish the chance to meet and network with women who are doing math in all kinds of ways. Spending the day with these inspiring women, I am energized to keep working to improve our environment. I hope that my efforts on the new AWM website result in more people seeing that the AWM is indeed "for you," whether you want to get involved in a student chapter, a Research Symposium, a Capitol Hill Day, or a National Mathematics Festival (or all of these!). Just as there are many ways to be a mathematician, there are many ways to be a part of this amazing organization, and together we only get stronger.

Biographical information: Michelle Snider is a Research Staff Member at the Institute for Defense Analyses' Center for Computing Sciences (CCS) in Bowie, Maryland. She received her BA in mathematics and physics from Smith College, her MA in mathematics from the University of California San Diego, and her PhD from Cornell University. Her thesis work was in algebraic combinatorics, in which she studied objects including Grassmannians, positroid varieties, and (combinatorial) pipe dreams.

Michelle works with mathematicians, computer scientists, engineers, physicists, and others to help solve the National Security Agency's critical challenges. During her eight years at CCS, Michelle has co-authored over ten classified research papers. She has spent several years as coordinator and lead for an annual summer-long workshop, in which researchers from academia, industry, and government form multidisciplinary teams focusing on selected research problems of current importance.

Michelle is currently the Chair of the AWM's Government Advocacy Committee, where she organizes the AWM's Capitol Hill Visits, including the most recent visit coinciding with the JMM in Baltimore. During this Hill Day, 50 AWM members met with 47 members of Congress in one afternoon. She received the 2018 AWM Service Award for her efforts on the new and improved AWM website. She is also a certified Les Mills instructor in SH'BAM, an energetic aerobic dance class.

Suzanne L. Weekes

Suzanne L. Weekes, Worcester Polytechnic Institute

Statement: I am honored to be considered for election to the AWM Executive Committee. I will repeat here what I have given as advice at http://mathematicallygiftedandblack.com/honorees/suzanne-l-weekes/

Show up—*take advantages of opportunities that are offered to you.*

Sit up front—*be engaged, be involved.*

Raise your hand—*never be afraid to ask questions, to answer, and to learn. Be an active participant in your experiences.*

In our mathematics community, the AWM works towards making sure that girls and women get more opportunities to participate. The AWM helps to make sure that there are opportunities for women to engage and participate as leaders and people of influence, and the AWM works towards ensuring a culture in which *all are comfortable* sharing their accomplishments, their ideas, and their challenges.

On a personal level, I was touched to have been the recipient of the AWM's 2019 Humphreys Award for the

Mentoring of Undergraduate Women. The comments that I was able to read from my former students remind me of the need for us to keep our work going from year-to-year and person-to-person. We have an impact, our work matters, and there is still more to be done.

Biographical information: Suzanne L. Weekes grew up in the Republic of Trinidad and Tobago and then went to Indiana University as an international student and received her BS in Mathematics. She moved to Ann Arbor, MI and earned her PhD in Mathematics and Scientific Computing from the University of Michigan in 1995. She held a Visiting Assistant Professor position in the Department of Mathematics and the Institute for Scientific Computing at Texas A&M for three years and then took up a position at Worcester Polytechnic Institute (WPI) in 1998. She is Professor of Mathematical Sciences at WPI and is now the Associate Dean of Undergraduate Studies ad interim.

Suzanne was honored and grateful to receive the 2019 Humphreys Award for the Mentoring of Undergraduate Women from the Association for Women in Mathematics last year.

She is involved in several initiatives connecting the academic mathematics community to mathematics and statistics work done in business, industry, and government, and with broadening the participation and success of students in mathematical sciences.

Her research publications are in numerical methods for differential equations including applications to spatio-temporal composites/dynamic materials and cancer growth.

AWM Ballot

You will receive an email on or about November 4, 2019, inviting you to vote electronically. Those who prefer may mail this ballot or a copy thereof to AWM, attn: Steven Ferruci, 201 Charles Street, Providence, RI 02940, to be received by **December 1, 2019**. You must validate a mail ballot by signing your name on the envelope, or your vote will not be counted.

President-Elect (vote for one):

❑ Kathryn Leonard ❑ _____

Treasurer (vote for one):

❑ Mary Shepherd ❑ _____

Member-at-Large (vote for up to four):

❑ Linda Chen ❑ Gretchen Matthews

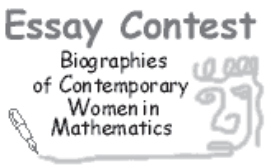
❑ Carla Cotwright-Williams

❑ Donatella Danielli ❑ Michelle Snider

❑ Elena Fuchs ❑ Suzanne L. Weekes

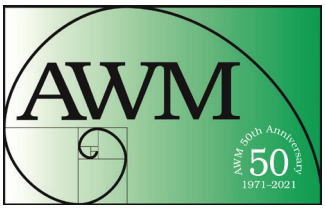
❑ _____ ❑ _____

❑ _____ ❑ _____



To increase awareness of women's ongoing contributions to the mathematical sciences, the Association for Women in Mathematics holds an annual essay contest for biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers. AWM is pleased to announce that the 2020 contest is sponsored by Math for America, www.mathforamerica.org.

The essays will be based primarily on an interview with a woman currently working in a mathematical career. The AWM Essay Contest is open to students in the following categories: grades 6–8, grades 9–12, and undergraduate. At least one winning entry will be chosen from each category. Winners will receive a prize, and their essays will be published online at the AWM website. Additionally, a grand prize winner will have his or her entry published in the *AWM Newsletter*. For more information, visit https://awm-math.org/awards/student-essay-contest/. The deadline for electronic receipt of entries is **February 1, 2020**. To volunteer to be interviewed, please visit the website https://awm-math.org/awards/student-essay-contest/ and sign up using the link at the bottom of the page.



ASSOCIATION FOR WOMEN IN MATHEMATICS

The AWM Fellows Program

I am very happy to announce the 2020 list of new AWM Fellows. We recognize these individuals for their exceptional dedication to increasing the success and visibility of women in mathematics. Please join me in honoring the 2020 AWM Fellows at the AWM Reception and Awards Presentation as part of the JMM in Denver at our new time: Thursday, January 16, 2019, from 6:00 pm – 7:30 pm.

—Ruth Haas, AWM President

2020 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 Tour Chayes, Microsoft
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.

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 Hawaii 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 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 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.

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.

A new class of Fellows will be announced each January at the JMM. When reviewing nominations for the Fellows Program, the selection committee will be flexible in evaluating excellence in any work showing compelling evidence of a sustained and lasting commitment to women in the mathematical sciences. The next nomination process will be held April 1 – May 15, 2020.

NSF-AWM Mentoring Travel Grants for Women

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

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

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

Deadline. There is one award period per year. Applications are due **February 1**.

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 sixth 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.

Linda Rothschild was the sixth president of AWM (1983–1985). For more about Rothschild, see her entries at Wikipedia and the Agnes Scott College Biographies of Women Mathematicians.

My Thoughts About AWM: Its Past, Present, and Future

Linda Rothschild

Following the amazing leadership of former AWM presidents Mary Gray, Alice Schafer, Lenore Blum, Judy Roitman, and Bhama Srinivasan, I became president in the mid-1980s. Like Bhama, I was pressed into service by a phone call from Alice, who informed me that I had to do it because everyone else had turned it down. Very flattering! In this essay, I will try to give some context, interspersed with recollections of my personal experiences, to AWM's growth from its inception to my term as president and beyond.

The idea for AWM began with groups of women meeting on the coasts, including Lenore and Judy in Berkeley, and Alice, Bhama, and me in Cambridge. Mary, who had moved from Berkeley to the Washington, DC area, was a tireless advocate for women in mathematics and united us all. It was the early 1970s, and the women's movement was in full swing. Like many other women, I grew up slowly learning about the obstacles facing a woman who wanted a professional career. Jobs listed in newspapers were divided into "Help wanted: male" and "Help wanted: female." The only professional jobs offered for women were for secretaries, nurses, or school teachers. The "best" and most well-funded academic high school (Central H.S.) in my home city, Philadelphia, was for boys only. Why spend so much on girls' college preparation when so many top colleges, including ones in the Ivy League, were closed to women or strictly limited female enrollment? From the colleges' viewpoint this restriction was reasonable, since women were unlikely to have prominent professional careers or become top donors. Female college students at Penn, where I was an undergraduate, were forced to enroll in the College for Women, where freshmen were rarely given serious academic guidance. Unlike male students, we were "protected" by strict curfew rules, forced to follow dress codes mandating skirts or dresses, and denied access to personal telephones. We were lucky to be able to attend a top university, but we were not treated as equal to male students. Fortunately for me, some math faculty members were impressed by my work and supported my ambition for a PhD in math. Also, fortunately, I didn't know how hard it would be.

In the 1960s, it was relatively easy for a new PhD from a good university to find a job in a math department, unless the applicant was female. One major difficulty for women was the existence of university nepotism rules, i.e., two related people, such as a husband and wife, could not be hired in the same department or sometimes not even in the same institution. This rule and the inherent difficulty of finding two positions in the same geographical location made it very hard for couples to find positions together. This is not to say that it was easy for single women to find appropriate employment. At that time positions were not usually advertised, and hiring was often done through the buddy system, where an advisor would find a job for a male student through phone calls to contacts. Many of the top PhD-producing math departments had no female faculty members at all, while others had only one. Prejudice against women in mathematics was often seen even at the graduate level. Princeton's math department did not even accept female graduate students until 1968. As a first year PhD student at MIT (the only woman in a cohort of 36), I was told by the department chairman that I should be proud to have been admitted, because stricter standards were applied to female applicants, who "tended to drop out." Was that a self-fulfilling prophecy?

The world changed in the 1970s with national anti-discrimination legislation and affirmative action. (Later, these two types of laws would be viewed by some as contradictory.) Previously all-male colleges like Princeton and Yale would now enroll women, while others, such as Harvard and MIT, greatly increased their numbers of female undergraduates. (Even Central H.S. in Philadelphia became co-ed, though it required an order from the U.S. Supreme Court.) Some mathematics departments even sought out

female candidates for faculty positions. Unfortunately, the academic job market in mathematics dried up in the 1970s, and there were few positions available for new PhDs, male or female. In fact, the AMS considered the employment problem one of its chief concerns at this time. Many men seeking jobs resented the push to hire women mathematicians who, they said, did not have families to support. I found my first academic position in 1970 when a faculty member at Tufts University died unexpectedly at the end of the academic year. After four other postdoctoral positions for a total of six years, I was offered an associate professorship at the University of Wisconsin–Madison. I had worked very hard, but I was also lucky to have made it that far. Others were lost in what is now called the "leaky pipeline."

AWM became an actual organization in the early 1970s and fought ceaselessly to increase opportunities for women, including the possibility of active participation in the leadership of the AMS. At that time officers and committee members of the AMS were all male, and not everyone was pleased with AWM's efforts to elect women to leadership positions in the AMS. Many complained that pushy women were advocating for mediocre women mathematicians to serve on the AMS Council and the Board of Trustees. Good for the pushy women of AWM! With the help of pressure from AWM, Julia Robinson, a world-renowned logician who herself had been the victim of nepotism rules at Berkeley, was elected president of the AMS. Other women were selected for various AMS leadership positions and also invited to give major talks at national and regional AMS meetings. AWM was recognized as a real part of the mathematical community by the end of the 1970s.

Yet as far as AWM had come, the organization was still small and far from being universally respected. By the early 1980s about 20% of mathematics PhDs were earned by women, up from about 6.5% in the 1960s. Although hiring in mathematics had recovered and even increased, some leading mathematics departments had still failed to hire any women at all, perhaps hoping that the "problem" would just go away. Women still had difficulty being taken seriously as mathematicians. Maternity leave (or parental leave) did not yet exist, and those of us who had young children sometimes had to pretend that our teaching or research lives were not affected by family responsibilities.

continued on page 16

CALL FOR NOMINATIONS

The 2021 AWM – Joan & Joseph Birman Research Prize in Topology and Geometry

The Executive Committee of the Association for Women in Mathematics has established the AWM – Joan & Joseph Birman Research Prize in Topology and Geometry. First presented in 2015, the prize will be awarded every other year.

The purpose of the award is to highlight exceptional research in topology/geometry by a woman early in her career. The field will be broadly interpreted to include topology, geometry, geometric group theory and related areas. Candidates should be women, based at US institutions who are within 10 years of receiving their PhD, or have not yet received tenure, at nomination deadline.

The AWM – Joan & Joseph Birman Research Prize in Topology and Geometry serves to highlight outstanding contributions by women in the field and to advance the careers of the prize recipients. The award is made possible by a generous contribution from Joan Birman who works in low dimensional topology and her husband Joseph Birman who was a theoretical physicist.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted. The nomination should include: 1) a one to three page letter of nomination highlighting the exceptional contributions of the candidate; 2) a curriculum vitae of the candidate not to exceed three pages; and 3) three letters supporting the nomination (submitted independently). Nomination materials should be submitted online at MathPrograms.org. The submission link will be available 45 days prior to the nomination deadline. Review of candidates will begin in mid-February. For full consideration, nominations should be submitted by **February 1, 2020**. If you have any questions, phone 401-455-4042, email awm@awm-math.org, or visit https://awm-math.org/awards/awm-birman-research-prize/ for more information.

Some female mathematicians even felt that joining AWM might endanger their future careers or make them appear to be less serious about research. A young woman holding a tenured professorship in a top-rated math department turned down an invitation to give a major AWM address, saying that she wanted to be recognized for her research, not just as a woman. Although I did not agree with her choice, I understood her reasons and felt that AWM still had to do more to reach its goals.

I did not have a grand agenda when I became president of AWM in 1983, but I tried to encourage young women in AWM to pursue research and to persuade women active in research to join AWM. I sent personalized letters (we used mail in those days) to all the women mathematicians I knew who were not yet members of AWM, urging them to join. To help young women apply for grants, I arranged grant-writing workshops at some of the annual meetings and organized panel discussions in which women described positive experiences in graduate school and in their early careers. Also, with Alice's help, AWM initiated graduate student memberships and chapters. Following my presidency of AWM, it seemed to be easier to find women willing to be candidates for the position. I'd like to think that my efforts to bring more women into the organization and to emphasize its role in encouraging mathematical research helped in this regard. However, a more likely reason is that AWM was now running rather smoothly, thanks to the efforts of many others. Given my lack of talent for running an organization, I'm sure that I inspired other women to think that it could not be too hard to be president!

It is now more than 30 years since I was president of AWM and much has changed in the mathematical world, as well as in the world at large. In later years some felt that AWM had focused too much on women in research and ignored the concerns of the many members at small colleges or working in government and industry. Future AWM presidents and officers have since worked to make AWM into the much more inclusive organization it is today. In some of the other sciences and engineering, women have organized themselves only as a "Committee for Women in X" as part of an umbrella organization. However, I think that AWM, because of its independence, has been able to do more to help women in mathematics than could have been done by committees of AMS, MAA, or SIAM. At annual and sectional meetings women always have a table to visit, a party and dinner to join, and invited talks and award ceremonies to attend. In recent years, mathematical conferences almost always include at least one female speaker; unfortunately this is not true in all scientific or technical fields. AWM also unembarrassedly sponsors conferences in which all speakers are women. As an organization, not just a committee, AWM gives opportunities for women to speak out and to take leadership roles.

The proportion of women among new PhDs in math has increased from about 6.5% in the 1960s to about 30% in the present. However, this number has not increased in the past 15 years. We need to understand this lack of growth in the context of other opportunities that have opened to women in the last few decades. Engineering, for instance, was essentially closed to women even at the undergraduate level until late in the 20th century. In the mid-1960s only 0.4% of BA and BS degrees in engineering were earned by women, a proportion that has increased (by a factor of more than 60) to about 25% in recent years. For the first time in its history, a majority of MIT engineering departments are now headed by women! Computer science (which did not even exist in the mid 20th century) is also attracting mathematically minded women, although the proportion of female PhDs in that field is still below 30%. Female scientists now achieving prominence through exciting discoveries in other endeavors, such as biology, chemistry, and astrophysics, are attracting young women to their fields.

Women mathematicians may not achieve equality in numbers with men in our lifetimes, but perhaps this is not the point. We mathematicians know that the joy and thrill of discovering or even understanding a beautiful mathematical proof or puzzle is unlike any other. Women who have the talent and ambition to pursue mathematics as a career should also have the opportunity!

Margaret M. Robinson to Receive 2020 Humphreys Award

Margaret M. Robinson

The Association for Women in Mathematics is pleased to present the tenth annual M. Gweneth Humphreys Award to Margaret M. Robinson, Julia and Sarah Ann Adams Professor of Mathematics in the Department of Mathematics and Statistics at Mount Holyoke College. Margaret Robinson has been a mainstay of 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."

Robinson has exhibited an exceptional commitment to the undergraduate mathematics community over her career and has received awards for teaching at Mount Holyoke and at the national level. Her impactful involvement in the Carleton Summer Mathematics Program (SMP), the Undergraduate Lectures for "Motivic Invariants and Singularities" at Notre Dame, the "Zeta Functions All the Way" Program for Women in Mathematics at the Institute for Advanced Study, and the resounding response from a range of former mentees speak to her effectiveness and her ability to forge personal connections.

In her 32-year career at Mount Holyoke College she has consistently displayed her commitment to mentoring women at the college level and beyond. Robinson received her PhD from Johns Hopkins University in 1986 under the supervision of Jun-ichi Igusa for her work on local zeta functions. Since then, she has inspired a deep love of number theory in countless women, with ripple effects extending far beyond her own students. Robinson is an expert in finding ways to give students the tools they need to begin work in p-adic analysis, mentoring seven REU teams between 1992 and 2007, her students at SMP, and her Mount Holyoke independent students. Many former students describe Robinson as a mentor for life. What constantly shines through in student responses is the true love of mathematics that Robinson radiates. As Keijing Jin (MHC, '19) puts it, "Margaret is the reason why I do and love math. Her passion and dedication have truly changed my life trajectory. Thanks for being the light for so many of my peers, Margaret!"

This award is named for M. Gweneth Humphreys (1911–2006). Professor Humphreys earned her master's degree from Smith College and her PhD at age 23 from the University of Chicago in 1935. She taught mathematics to women for her entire career, at Mount St. Scholastica College, 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.

Erika Camacho to Receive 2020 Hay Award

In recognition of her leadership and contributions as a mathematical scholar and educator, the Association for Women in Mathematics presents the 2020 Louise Hay Award to Dr. Erika Camacho of Arizona State University. This award will be presented at the AWM Reception at the JMM in Denver, Colorado in January 2020.

Camacho has a passion for mentoring, especially the mentoring of underrepresented students. Her excitement for mathematics is prominent and accessible to her students, with projects grounded in her research in mathematical physiology, specifically the development of mathematical models which describe the interactions of photoreceptors in the retina. Her work provided the first mechanistic models of such interactions and has resulted in key collaborations with top experimentalists in the field. Camacho brings graduate and undergraduate students into her own research collaborations as well as seeing it as her duty to find opportunities for students with other researchers.

Camacho created the Applied Mathematical Sciences Summer Institute and has co-directed both this institute (2004–2007) and the Mathematical and Theoretical Biology Institute (2011–2013). Through these institutes and her other mentoring programs, she has impacted over 600 undergraduates, including the supervision of the research of 89 of these students, with 30 receiving conference award recognition!

Through her work Camacho changes perceptions. Her own story is an existence proof that a Latina from an underprivileged 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, focusing 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 perceive as successful mathematicians.

In being recognized for her work, Camacho received a 2014 PAESMEM (Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring) in June 2018 and the American Association for the Advancement of Science Mentor Award in January 2019.

Erika Camacho

Established in 1991, the Hay Award recognizes outstanding achievements in any area of mathematics education. Louise Hay was widely recognized for her contributions to mathematical logic, for her strong leadership as Head of the Department of Mathematics, Statistics, and Computer Science at the University of Illinois at Chicago, for her devotion to students, and for her lifelong commitment to nurturing the talent of young women and men. 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.

ASSOCIATION FOR WOMEN IN MATHEMATICS

Graduate Student Poster Session, AWM Workshop at the 2020 SIAM Annual Meeting

The application deadline for this session has been extended to **January 2, 2020**. See the September–October issue of this newsletter or https://awm-math.org/meetings/awm-siam for further information.

BOOK REVIEW

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

Women in STEM on Television: Critical Essays, edited by Ashley Lynn Carlson, Jefferson, NC: McFarland, 2018, 210 pp. softcover ISBN 978-1-4766-6941-0 e-book ISBN 978-1-4766-3280-3

Reviewer: Sarah J. Greenwald, Appalachian State University

In the introduction to *Women in STEM on Television: Critical Essays*, I really like the discussion of why it can be important to pay attention to representations in popular culture, although some of the statistics about STEM majors and viewing habits are a bit out of date. Carlson, the editor and author of a few chapters, introduces a theme that runs throughout the work: shows can lead to cultural shifts in perceptions about STEM careers and can break down barriers even as they reinforce stereotypes. Here are a couple of things you should know: In this book, the term "television" is inclusive of shows streaming on the web. Please be forewarned that there are some very major spoilers in the book, e.g., for the show *Bones*.

Each chapter includes feminist theories and a detailed analysis of one or more fictional characters. The authors explain the theories using easy to understand language and examples. While I have watched some of the shows in the book, others were new to me. Even so, I found there is enough detail to successfully contextualize the tropes. I especially appreciate the detailed endnotes and many useful references. I also like the connections to educational and psychological research.

The book focuses on persistent stereotypes from popular culture. That these themes continue to arise and that "little progress has been made since the 1990s" (p. 67) is depressing but not surprising. These include the inability of characters to have reasonable work-life balance or healthy relationships, an undue focus on their appearance, conflicts between femininity and intelligence, themes of isolation, and much more. The book investigates many of the stereotypes that I would expect to see in such a volume and also gives some examples of positive changes. One area that has improved over time is in the inclusion of more diverse representations of race and ethnicity in girls or women in STEM on television. In the volume, this is particularly evident in some of the shows that are marketed towards children.

I also appreciate the material on the back cover, although the term "woefully underrepresented" seems to be there in order to sensationalize the book:

> Women remain woefully underrepresented in science, technology, engineering and math (STEM). Negative stereotypes about women in these fields are pervasive, rooted in the debunked claim that women have less aptitude than men in science and math. While some TV series present portrayals that challenge this generalization, others reinforce troubling biases—sometimes even as writers and producers attempt to champion women in STEM. This collection of new essays examines numerous popular series, from children's programs to prime time shows, and discusses the ways in which these narratives inform cultural ideas about women in STEM.

With an editor seemingly so aware, it is disappointing that the front cover restricts itself only to young white characters (Jordan Cavanaugh, a medical examiner from *Crossing Jordan*, Molly Hooper, a specialist registrar in the morgue from *Sherlock*, and Cosima Niehaus, a former PhD student in biology in *Orphan Black*) even as it may be breaking down other stereotypes for those who are more familiar with their roles (e.g., STEM in large font could be associated with Niehaus' sexuality, for those who happen to know about it from the show). The chapters mainly focus on one or more girls or women from the following shows: *Adventure Time*, *Agent Carter*, *Annedroids*, *Arrow*, *Bones*, *Criminal Minds, Crossing Jordan, CSI: Miami, Doctor Who*, *NCIS*, *Project Mc²*, *SciGirls*, *Scorpion*, *Sherlock*, *Silent Witness*, *Stargate SG-1*, *Star Trek: Voyager, Steven's Universe*, and *The 100*. Like those on the front cover, the women in STEM skew towards medicine and biology, where women are definitely not "woefully" underrepresented in real life or on television.

On the other hand, in this book women mathematicians really are woefully underrepresented! I was excited when my eye jumped to a PhD in Mathematics on page 15, but it was to a statement that Danica McKellar holds such a PhD (she doesn't). The article references an entry on Biography.com, which to date does indeed claim that. I believe that her "PhD" has falsely propagated from a misreading of a July 19, 2005 article "Between Series, an Actress Became a Superstar (in Math)" by Kenneth Chang in *The New York Times*, which mentions Brandy Winn,

McKellar's research partner at UCLA, who earned her PhD from the University of Chicago. Sadly, this brief inclusion of McKellar, who actually has a BS degree in mathematics from UCLA, is the only reference I could see to a specific woman mathematician in the book, whether fictional or real. On page 77, author Natalie Krikowa describes a 2012 study from the Geena Davis Institute on Gender in Media that has no women mathematicians in it. Looking at the context of the study, we see that it only sampled shows that aired from February 6–March 4, 2012 and 100 popular films from 2006–2011 [https://seejane.org/wp-content/uploads/full-study-gender-roles-and-occupations-v2.pdf]. By these parameters it wouldn't have included numerous films or shows we covered in the *AWM Newsletter*. Those included *Agora* [Jan–Feb 2011 41(1): 22–24] and *Julia Robinson and Hilbert's Tenth Problem* [Jul–Aug 2009 39(4): 9–13; Jan–Feb 2012 42(1): 11], which was appearing on TV at the time, just to name a couple of examples of media from the study's time period that did include women mathematicians.

That isn't to say that math isn't mentioned at all. Almost every article relates to broader educational and career issues for women in STEM, including mathematics, which I really like. In addition, I did have fun trying to compare and contrast related *Newsletter* articles with items in the book. FBI agent Patterson's propensity for algebra, geometry and more makes its way into the chapter "A Bad Case of the Feels: Emotion Versus Reason on *Blindspot*." The article we had in the *Newsletter* on *Blindspot* was, not surprisingly, shorter and more focused on the representation of mathematics and what messages it might be sending [Jan–Feb 2017 47(1): 9]. Aside from the McKellar goof in the chapter "Achievements, Gaps and the 'Achievement Gap': STEM in Children's Programming," I enjoyed comparing the similar themes expressed in somewhat different ways as those in the *Newsletter* article "*Project Mc²*: Whose Project?" [Mar–Apr 2016 46(2): 25–26]. Would you like your Sherlock analysis with or without a mathematician? One chapter in the book focuses on "A Woman in a Man's (Fictional) World: Considering the Importance of Dr. Molly Hooper in the BBC's Modern Adaptation of *Sherlock*" but makes no connection to mathematics. In the *Newsletter* we analyzed the (very minor) character of Sherlock's mother [Sep–Oct 2014 44(5): 13] specifically because she was a mathematician. Conversely, I wasn't sure why *Bones* earned only a brief and mathless treatment in the book with a narrow focus on Daisy, an intern who appeared only sporadically, rather than the lead character Bones who was connected to mathematics and science in more meaningful ways throughout the 12-year run of the show. In the *Newsletter* we have "*Bones*: A Mathematical Retrospective" [Jan–Feb 2018 48(1): 9] which references multiple such connections.

What does it say that women in mathematics on television didn't really make it into the book? I think this is mostly due to the personal interests of the authors. For instance, they tend to leave out the mathematics and science in deference to identity issues. Some of the articles are quite light on STEM connections. An especially glaring omission, in my view, is *Orphan Black*'s science consultant Cosima Herter. After all, there is an entire chapter in the book devoted to the character Cosima in the show (pp. 86–101), who is named for her [http://www.bbcamerica.com/shows/orphan-black/video-extras/season-2/episode-01-nature-under-constraint-and-vexed/insider-meet-the-real-cosima]. The book addresses the fact that science can be used to indicate the intelligence of a character, but aside from Patterson it misses the opportunity to connect that to mathematics.

Overall, if the editor had been more conscious about being inclusive of additional fields in STEM, then mathematics and mathematicians could easily have been a larger part of the volume. There are many examples to choose from that would fit in well (see numerous media columns in the *Newsletter*). While the M in STEM is mostly missing from this work, it had me reflecting more broadly on gender and STEM themes in popular culture. I enjoyed the critical analysis of the shows, both those old and new to me, and the many connections to the literature. Thus, despite my reservations above, I would still recommend this book to anyone who is interested in mathematics and popular culture.

Symposium in Honor of Julia Robinson's 100th Birthday: The symposium will be held at MSRI on December 9, 2019 and is free of charge. Confirmed participants in this day-long celebration of Robinson's work and of current mathematics inspired by her research include: Lenore Blum, Lou van den Dries, Martin Davis, Kirsten Eisentrager, and Yuri Matiyasevich. See msri.org/workshops/955 for more info.

The Karen EDGE Fellowship Program: The EDGE Foundation has received an extraordinary gift from Abel Prize winner, Karen Uhlenbeck, which is being used to establish this Program to support and enhance the research programs and collaborations of mid-career mathematicians who are members of an underrepresented minority group. Applications are due **February 1, 2020**; see www.edgeforwomen.org/karen-edge-fellowship-program/ for further information.

EDUCATION COLUMN

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

Two Trends in Higher Ed: One Old, One New

Jackie Dewar, Professor Emerita of Mathematics, Loyola Marymount University

Two unrelated topics caught my attention recently: gender disparity in degree attainment and the increasing role artificial intelligence (AI) is playing in higher education. Rather than choose, I decided to write about both.

Gender disparity in degree attainment—in favor of women—is an old trend, dating back to 1982 when women first received more than 50% of bachelor's degrees in the US.[1] During the period 2000–2016, women earned 57% of all bachelor's degrees each year.[2] In fact, women have been a majority of college-educated adults (ages 25 and older) since 2007. According to a Pew Research Center analysis of U.S. Bureau of Labor Statistics data, a new milestone is occurring this year.[3] In the first quarter of 2019, women comprised a majority (50.2%) of the college-educated labor force. Not surprisingly, the reason why it has taken more than a decade for women to reach parity in the college-educated workforce is that college-educated women are less likely to be in the labor force.[4] And, as readers of the *AWM Newsletter* surely know, women continue to be underrepresented in many math-related occupations (computer scientists, engineers, economists, etc.).

Still, the growing number of women in the college-educated workforce is good news, because educational attainment is highly correlated with income. Therefore, this trend should lead to greater earning potential for women overall and eventually contribute to the narrowing of the wage gap.

Let's move on to the new trend I want to examine in this column.

I was drawn to the topic of AI by a small piece appearing June 19, 2019, in *Inside Higher Ed* (*IHE*), titled "The Emerging Roles of AI in Education: Artificial intelligence is the now and future engine of education."[5] The author, Ray Schroeder, is director of the National Council for Online Education.[6] Citing GetSmart,[7] a commercial educational planning, design, and promotion firm, Schroeder wrote that in certain areas, including math, "AI is engaged in making our teaching and learning better than ever before." If true, that sounded pretty good, but I was rather concerned about other observations in the article, such as this one: "a college's bottom line and reputational value will improve through the use of artificial intelligence tools to enhance the marketing, assessment of applicants and monitoring success of students." Following the link embedded for this quote,[8] I eventually found my way to an article (Dennis, 2018) that acknowledged potential ethical pitfalls of using AI in college admission and retention. Not surprisingly, at the root of these are the problems of integrating ethical principles into algorithms and obtaining reliable data sources.

Schroeder's IHE article cited a RAND Corporation study (Murphy, 2019) for this statement: "AI has so far found a perch in three 'core challenges' of teaching: intelligent tutoring systems, automated essay scoring and early warning systems to identify struggling students who may be at risk of not graduating." But the RAND report actually says something rather different: "The scope of this paper is limited to AI applications designed to address any one of [those] three core challenges of teaching (Murphy, 2019, p. 2)."

Notably, the RAND report contained these two caveats not included in the IHE article, but certainly worth our notice.

> As long as these applications are used within the narrow contexts in which they were designed to operate and learn, their performance is quite accurate and reliable. However, once the applications are used in a new or different context, they can become prone to error and have limited utility. (Murphy, 2019, p. 2)

[1] https://www.cnsnews.com/news/article/terence-p-jeffrey/women-earn-57-us-bachelors-degrees-18th-straight-year

[2] Ibid.

[3] https://www.pewresearch.org/fact-tank/2019/06/20/u-s-women-near-milestone-in-the-college-educated-labor-force/

[4] The labor force consists of people working or looking for work.

[5] https://www.insidehighered.com/digitallearning/blogs/online-trending-now/emerging-roles-aieducation?utm_source=Inside+Higher+Ed&utm_campaign=00a247e00f-DNU_2019_COPY_01&utm_medium=email&utm_term=0_1fcbc04421-00a247e00f-197440497&mc_cid=00a247e00f&mc_eid=2c8b5acac0

[6] https://upcea.edu/the-national-council-for-online-education/

[7] https://www.gettingsmart.com/2018/08/32-ways-ai-is-improving-education/

[8] https://edservices.wiley.com/artificial-intelligence-in-higher-ed/

> Research should focus on understanding the unintended consequences that these systems might have on instructional decisions and opportunities as a result of possible learned bias in the algorithmic models or of inaccuracies in model predictions, recommendations, and feedback. (Murphy, 2019, p. 14)

In his closing paragraph in *IHE*, Schroeder wrote quite enthusiastically: "All across the spectrum of higher education … AI will be our new partner in education." He exhorted IHE readers to "closely [follow] the field and [include] AI in discussions and planning for the future of your students, your departments and your university."

I hope this column has given you additional reasons to investigate and engage in discussions and planning about the use and impact of AI at your institution.

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New AAAS Report on Instructional Practice in STEM

Jackie Dewar, Professor Emerita of Mathematics, Loyola Marymount University

The AAAS has just published a 200-page report describing the current state of research-based reform in undergraduate STEM instruction, titled *Levers for Change: An assessment of progress on changing STEM instruction*. Each of six broad disciplinary areas—Life Sciences, Chemistry and Biochemistry, Engineering and Computer Science, Geosciences, Mathematical Sciences (including Statistics), Physics and Astronomy—are considered in turn. The chapter on mathematics and statistics is titled: Undergraduate Mathematics Instruction: Not as Bad as You'd Think? A digital copy of the full report and a two-page summary are available at: https://www.aaas.org/ resources/levers-change-assessment-progress-changing-stem-instruction. Anyone interested in mathematics teaching or professional development should take a look at it.

Column Editor's Note

In 2020, there will be a few changes in the line-up of Education Column writers.

Jessica Hale will be taking a break from writing for the column. We thank her for sharing her perspectives on topical issues, such as status and power dynamics in mathematics education and pop culture's negative depiction of the Common Core.

Suzanne Lenhart is bowing out after writing a total of ten Education Columns dating back to 2007. From 2010 through 2016, she shared responsibility for the March/April slot with Betsy Yanik and then took it on alone for three more years. Suzanne brought readers news of special mathematics programs, competitions, outreach efforts at her home institution and across the globe, and the Mu Alpha Theta mathematics honor society. Many thanks to Suzanne for all her contributions.

The two new writers joining the rotation are Megan Breit-Goodwin and Minerva Cordero.

Dr. Megan Breit-Goodwin (January/February issue) is a mathematics instructor at Anoka-Ramsey Community College in Coon Rapids, MN. She is a member of the AWM Education Committee and Principal Investigator for Project SLOPE, an exploration and design project funded by the National Science Foundation (NSF-IUSE: EHR #1726891) to explore the opportunities and structures that support two-year college mathematics faculty engagement in the Scholarship of Teaching and Learning.

Dr. Minerva Cordero (March/April issue) is Professor of Mathematics and Associate Dean for Academic Affairs of the College of Science at the University of Texas at Arlington. She is currently serving as Program Director in NSF's Division of Human Resource Development with responsibilities for ADVANCE: Organizational Change for Gender Equity in STEM Academic Professions and Improving Undergraduate STEM Education: Hispanic-Serving Institutions (HSI Program).

We look forward to hearing from them in 2020 and beyond.

The continuing column contributors are Erica Walker (May/June), Anna Bargagliotti (July/August), Pat Kenschaft (September/October), and myself (November/December). The column also welcomes additional submissions on appropriate topics from readers who are not in the usual rotation. Send those to jdewar@lmu.edu for consideration.

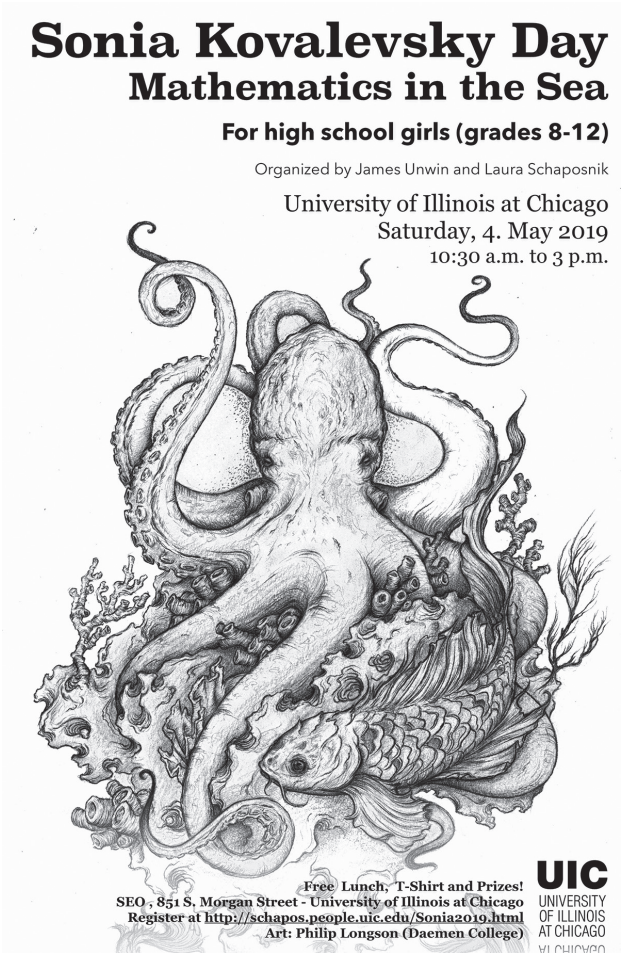
STUDENT CHAPTER CORNER

Coordinator: Emily Sergel, esergel@math.upenn.edu

Mathematics in the Sea

Laura P. Schaposnik and James Unwin, University of Illinois at Chicago

On May 4th 2019, with the help of several volunteers, we organized the fifth Sonia Kovalevsky Day for girls at the University of Illinois at Chicago (UIC), in cooperation with the AWM. As we highlighted in the preceding *AWM Newsletter*, Sonia Kovalevsky Days have been organized nationwide by AWM members for almost 30 years. Sonia Kovalevsky Days consist of a program of workshops, talks, and problem-solving competitions for female high school and middle school students and their teachers, both women and men. These days are hosted to encourage young women to continue their study of mathematics, and to introduce them to older women who could act as mentors and role models in years to come. It has been of much importance to us to create links with female principals of local schools in Chicago who are now actively helping to promote the UIC Kovalevsky days. Together with the help of the Public School District offices, this year the registration included students from about 20 schools, and 93% of the girls registered had never been to a Sonia Kovalevsky Day before.



On the day itself, after an introduction to the AWM for the students and teachers, there was a brief presentation of Sonia Kovalevsky's achievements and the obstacles she overcame in her life. The students were then separated into groups for the activities of the day. The theme for this fifth Sonia Kovalevsky Day at UIC was Mathematics in the Sea, and the students were taught three different lessons.

Fractal Coastlines. In the mid-20th century Lewis Fry Richardson pointed out that the question "How long is the coastline of Great Britain?" has no explicit answer and can only be estimated. Indeed, a coastline typically has a fractal dimension, thus making the notion of length inapplicable, leading to the coastline paradox, which states that the coastline of a landmass does not have a well-defined length. This lesson was presented to teach the students to appreciate the appearance of fractals in nature, understand the main properties of fractals (e.g. recursion, self-similarity, scaling ratio, and scaling exponent), and introduce Richardson's theory of coastlines.

Seaweed Tangles. Seaweed naturally tangles in the ocean and provides perfect examples of knots and links appearing in nature. These tangles can be classified using different invariants. The linking number and writhe are the first numbers one can associate to knots and links. We highlighted the use of seaweed in understanding long-standing problems, for instance the Collatz conjecture. This lesson had three overall goals: Understanding the linking number of a tangle; calculating the writhe of knots; and appreciating the appearance of diverse knot theory in nature.

Geometry of Seashells. The third lesson was seashells. The natural world is a rich source of inspiration for mathematics. In particular spirals arise in seashells, flowers, and spiral galaxies, all following the same geometric principles: the beauty of nature arising from the elegance of mathematics. In this class the students learned about the Fibonacci sequence and golden ratio, and how they arise in the geometry of nautilus seashells. In particular the students constructed a Golden Spiral and compared this to seashell patterns, and were able to appreciate the appearance of mathematical structures in nature.

At the end of the day, the participants were asked to complete a short anonymous questionnaire about their experiences at the event. Interestingly, everyone agreed that they were somewhat likely to encourage their friends to

attend a similar event in the future, and almost everyone said they'd like to attend future Sonia Kovalevsky Days. We also asked the students how likely they were to study math in the future, and over 50% responded as "very likely" to do so, and about 40% had not made up their mind yet. When asked about what aspects of the day they liked most, the girls mentioned the lectures as their main attraction, together with the activities done during lunch. One of the highlights of their day was the lunch time magic show presented by Lou Kauffman (from UIC's Mathematics Department). Moreover, one student mentioned that what she liked most was that

"Everyone was eager to help," which is exactly the impression one wants to transmit during these days.

The website for the 2019 event (with more photos) is http://schapos.people.uic.edu/Sonia2019.html. This year's event was financed through Schaposnik's start-up fund (50%) and her NSF grant (50%). Since similar events could be hosted without much difficulty at other institutions, we prepared a short note on how to organize a Sonia Kovalevsky day; see the Student Chapter Corner in the preceding issue of this *Newsletter* for some details on what needs to be done during, before and after the event.

In Memoriam

Mariangely (Mari) Castle

Mari Castle, born May 6, 1969, died on July 9, 2019. She received bachelor's degrees in mathematics and computer science from Kennesaw State University in 2003 and her PhD from Emory University in 2008. She brought joy and support to other women in the Emory mathematics program, where she was a founding member of the Emory AWM student chapter.

Upon graduation she joined the mathematics faculty of Kennesaw State University, leaving academia in 2014 to pursue work in data science at SalesLoft. Mari was involved with the Atlanta Roller Derby, where she skated under the very mathematical name Quadratic Abrasion. A tribute to her from her roller derby friends appears at https://www.facebook.com/permalink.php?id=66175306334&story_fbid=10157058635866335.

Her former professors and classmates at Emory University made a gift to AWM in her honor, saying: *We remember her laughter, strength, courage and support with this memorial gift.*

Share Your News!

Denise A. Rangel Tracy, Fairleigh Dickinson University

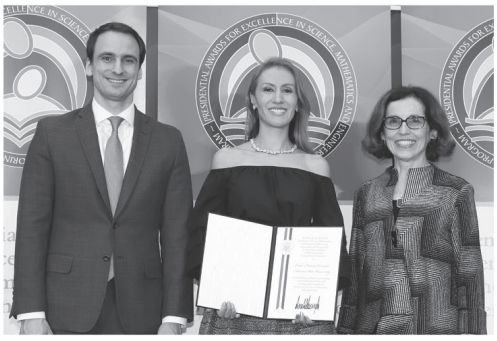
AWM celebrates the work and accomplishments of women throughout the mathematical sciences. You can learn about these achievements on any of our social media platforms. We are on Facebook (Association for Women in Mathematics), Twitter (@AWMmath) and most recently Instagram (awmmath). Please feel free to tag us in any relative post.

Do you know of any opportunities for or accomplishments of women in mathematics? If you do, we would love to hear about it. You can simply make a visitor post on our Facebook page. Once it's reviewed and approved it'll appear on our community page. We love pictures, too. You can send us photos of AWM-related events through our website (https://awm-math.org): just click on MEETINGS, scroll down a bit, and on the left you'll see the link to share a photo.

Are you a super fan of AWM who wants to help spread the news? Join our social media committee. Email Marie Vitulli at vitulli@uoregon.edu for more information.

Do you know a STEM mentor who has made a difference in your community?

Nominate them for the Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM)!



Individuals and organizations in all public and private sectors are eligible for PAESMEM awards, including industry, academia, K–12, military and government, non-profit organizations, and foundations. Exceptional STEM or STEM-related mentoring in both formal and/or informal settings is eligible for the PAESMEM award.

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NORTHWESTERN UNIVERSITY—Applications are invited for Tenured and Tenure-track positions starting in September 1, 2020. Priority will be given to exceptionally promising research mathematicians. We invite applications from qualified mathematicians in all fields. Minimum qualifications include a Ph.D. in Mathematics, which must be conferred by September 1, 2020. Applications should be made electronically at www.mathjobs.org and should include (1) the American Mathematical Society Cover Sheet for Academic Employment, (2) a curriculum vitae, (3) a research statement, and (4) four letters of recommendation, one of which discusses the candidate's teaching qualifications. Inquiries may be sent to: tenure@math.norhtwestern.edu. The review process starts **November 1, 2019**; applications arriving after this date may also receive consideration. Northwestern University is an Equal Opportunity, Affirmative Action Employer of all protected classes, including veterans and individuals with disabilities. Women, racial and ethnic minorities, individuals with disabilities, and veterans are encouraged to apply. Hiring is contingent upon eligibility to work in the United States.

POMONA COLLEGE invites applications for a tenure track position in the Department of Mathematics, at the rank of Assistant Professor, beginning July 1, 2020. We are looking for candidates who are committed to excellence in teaching and research, and who will be excited about mentoring students and supervising student research. The department has directed much effort towards creating a supporting community for all students, and is particularly interested in candidates who have experience working with students from diverse backgrounds and a demonstrated commitment to improving access to and success in higher education for underrepresented students. The department invites applicants in the areas of Analysis, Topology, Geometry, or Probability broadly construed. Those who display fluidity in crossing barriers between pure and applied mathematics and/or are comfortable working with real-world data are particularly encouraged to apply. Duties of the position include teaching four semester courses per year, and the direction of student senior projects on a wide range of topics. Pomona College is a highly selective residential liberal arts college attracting an economically and geographically diverse student body, located 35 miles east of downtown Los Angeles. It is the founding member of the Claremont Colleges, a consortium of seven institutions with over forty active mathematicians. Pomona College is an equal opportunity employer and especially invites applications from women and members of underrepresented groups. Applications are to be submitted at Mathjobs.org. A complete application will include a curriculum vitae, graduate transcripts, at least three letters of recommendation (at least one of which evaluates teaching), a description, for the non-specialist, of research accomplishments and plans, a statement of teaching philosophy, and a diversity statement. Applications completed by **December 1, 2019** will receive full consideration.

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