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

Dear AWM Friends,

As mathematicians, we want to quantify everything: uncertainty and predictability, fairness and symmetry, complexity and simplicity, categories and diversity. We talk about numbers, improving the statistics, moving the needle. We want to reform, support, persist. With a record 102 women in the 116th Congress's House of Representatives and 126 in the Congress as a whole, it seems like a good time to take stock. Women still hold only 23.6% of the seats in Congress. The number of self-identified LGBTQ+ Representatives has increased, and we will have our first Native American and Muslim women in Congress, but representation of most ethnic groups is still below the percentages in the population.

In mathematics, we are still struggling for representation as well. The AMS 2016 Data on the Profession[1] shows that approximately 30% of new mathematics PhDs in the US are women, with 20% of new tenure-track jobs at PhD granting institutions going to women. One Fields medal has been awarded to a woman, and we have celebrated some fantastic women mathematicians. But it is still the case that an overwhelming majority of national and international prizes in mathematics go to men.

What can we do as an organization to address what is a long-standing societal problem? Can we use our analytical skills to solve society's problems? We can absolutely help, and my colleagues everywhere are doing just that. They have developed models to predict elections, avoid gerrymandering, prevent and treat diseases, and understand the spread of false news and the effect of gun control.[2] One study that caught my attention suggests a mathematical model of inoculation against stereotype threat.[3] The idea is that stereotype threat, i.e., the effect of one's group being negatively stereotyped in a specific domain, undermines one's sense of belonging, leads to weaker performance and, eventually, to leaving the field altogether. In fact, it has been shown that this sense of not belonging can

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[1] http://www.ams.org/profession/data/emp-survey

[2] If you're interested, a new Research Collaboration Workshop "Women in Mathematics and Policy" will be held at IPAM January 22–27: https://www.ipam.ucla.edu/programs/special-events-and-conferences/women-in-mathematics-and-public-policy/?tab=overview

[3] Nilanjana Dasgupta: "Ingroup Experts and Peers as Social Vaccines Who Inoculate the Self-Concept: The Stereotype Inoculation Model," *Psych. Inquiry* 22(4) 2011.

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.

PRESIDENT'S REPORT *continued from page 1*

result in people leaving, say, mathematics even when they perform at the same level as their peers. The proposed vaccine is simple: exposure to in-group experts and to peers who are high-achievers in the field. I'll note that this is just one vaccine, and others—equally effective, and in fact synergistic—have been proposed.

In this context, the AWM can play multiple roles. We can support the development of interventions that protect against bias, against threats against equitable access to opportunities. This means organizing workshops and studies, facilitating the gathering of data, and supporting trial interventions that can test strategies and policies. We can then help to *implement* these interventions. For example, the AWM promotes speakers lists, and research networks provide the mathematics community the names of women who are willing to serve as in-group experts, vaccinating groups of young mathematicians against stereotype threat by eroding that sense of non-belonging. Research Collaboration Networks forge alliances between young researchers and peer achievers, alliances that can last for years. We can increase the visibility of mathematicians from other underrepresented groups by supporting and partnering with organizations like NAM, Mathematically Gifted and Black, and Lathisms.

The inequities and the challenges that we face are structural, but the effects on our lives can be personal. Societal structures are stable and relatively slow to change because we need the cooperation of so many to reconfigure and to change directions. Let's not be discouraged: we've made progress, and we continue to move forward. Let's turn to help each other through our personal hurts, and let's come together to change the underlying structure of our society.

AWM News. As always, I am impressed by the energy and effectiveness of our volunteers. I'd like to give huge thanks to the Policy and Advocacy Committee: **Sara Billey**, **Courtney Gibbons**, **Pamela Harris**, **Gail Letzter**, **Karen Saxe**, **Michelle Snider** and **Julie Sutton**. This committee has worked quickly through so many issues these past months: statements on Title IX, transgender rights, the imprisonment of Professor Betül Tanbay, a new Diversity Statement, and setting Hill Day priorities, to name just a few.

The AWM Springer Series continues to make our work more visible, now boasting 16 volumes. The latest title in the series is: *Recent Trends in Algebraic Combinatorics*, edited by **Hélène Barcelo**, **Gizem Karaali**, and **Rosa Orellana**.[4]

MAA MathFest 2018 in Denver was a fun-filled event, as usual. I want to fill you in on some things that we haven't reported on elsewhere. We had some great photos last issue, along with a report on Corinne Yap's one-woman play *Uniform Convergence* in the Media Column. The AWM Town Hall led by Alejandra Alvarado, Candice Price, Farrah Jackson Ward and Cassie Williams was lively, illuminating, and just too short for the issues we discussed (see the report on pages 17–19). Another highlight of the meeting was the "Town Hall on Mathematical Mamas—Being Both Beautifully," reported on (along with other activities) in an AMS blog entry at PhD + epsilon. Pamela Gorkin's AWM-MAA Falconer Lecture gave an enticing glimpse into her new book *Finding Ellipses: What Blaschke Products, Poncelet's Theorem, and the Numerical Range Know about Each Other*, just released by

[4] https://www.springer.com/series/13764?detailsPage=titles

the AMS. I was entertained, enthralled, and enriched by her talk, as was the rest of the audience.

Along with the Falconer Lecture, there were many other invited addresses delivered by women, including many you'll recognize for their AWM connections. Raegan Higgins, a co-organizer of our 2019 AWM Research Symposium, delivered the MAA-NAM David Harold Blackwell Lecture. Have you ever wondered what lies between continuous and discrete models? Wonder no more—just listen to Higgins' lecture. Invited lecturer Lisette de Pillis, my long-time friend and colleague, and one of the group leaders in our WhAM! Research Collaboration Network, gave a wonderful talk about models of tumor-immune dynamics. Past EC member Talitha Washington gave the MAA James R.C. Leitzel Lecture, giving the audience insights into how culture affects our learning of mathematics; I think we all left the room with new ideas on how to effect positive change. Eugenia Cheng's invited lecture continued the theme of inclusion, but from the perspective of category theory. Eugenia also helped us celebrate the MAA community at the President's Membership Jubilee, where she joined me in a performance of Henriëtte Bosman's "Nuit Calme," among other offerings. (We thought it only fitting that we should perform at least one piece by a woman composer!) In short, a terrific time was had by all. Please join us in Cincinnati in 2019 if you can!

Get ready for our new website! We are very grateful to our friends at Google for setting up our current website over 10 years ago, but all things inevitably evolve. The new website will improve communication among AWM members and help us connect to the broader math community. We know that AWM programming helps change the landscape for women across the mathematical sciences. This change is most effective when we participate in the process, but members need to understand how to do that and to see how the AWM is working for them. We hope that the new site meets all of these goals and provides you the venues to participate more deeply.

JMM is in just a few days, and the AWM will again have a strong presence. (See https://sites.google.com/site/awmmath/awm-at-jmm.) Come hear **Bryna Kra** (the 2019 Noether Lecturer) recognized for her work in ergodic theory, celebrate with us Wednesday night at the AWM reception, and support the poster presenters Friday evening just before hearing AWM EC member **Talithia Williams** give the Cox-Talbot NAM lecture in this, NAM's 50th year. On Saturday, listen to talks on Applied and Computational Topology at the AWM Workshop. Stop by the AWM booth and buy an AWM T-shirt! Wear it Saturday to show your support for the Women's March.

Ami Radunskaya

With love and hope,

Ami Radunskaya
November 27, 2018

Membership Dues
Membership runs from Oct. 1 to Sept. 30
Individual: $70 **Family:** $35
Contributing: $160
New member, affiliate and reciprocal members, 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 www.awm-math.org for details on free ads, free student memberships, and ad discounts.

Executive Sponsorship Levels

$5000+
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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 Kavita Ramanan, kavita_ramanan@brown.edu. Send everything else, including ads and address changes, to AWM, awm@awm-math.org.

ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM ONLINE

The *AWM Newsletter* is freely available online.

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

Website: http://www.awm-math.org
Updates: webmaster@awm-math.org

Media Coordinator
Joanna Wares; jwares@richmond.edu

AWM DEADLINES

RCCW Proposals:
January 1 and July 1, 2019
AWM Essay Contest: January 31, 2019
AWM Research Symposium Poster Session: January 31, 2019
AWM Travel Grants: February 1 and May 1, 2019
AWM Mentoring Travel Grants: February 1, 2019
AWM-Microsoft Research Prize: February 15, 2019
AWM Poster Contest: February 15, 2019
AWM-Sadosky Research Prize: February 15, 2019
AWM Student Chapter Awards: April 15, 2019
AWM Louise Hay Award: April 30, 2019
AWM M. Gweneth Humphreys Award: April 30, 2019
AWM Fellows: May 15, 2019

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CALL FOR SUGGESTIONS

In December 2019 we will be electing the following officers: President-Elect, Clerk and four At-Large Members. Suggestions for candidates may be made to Ami Radunskaya or Ruth Haas by **February 15, 2019**; they will pass them along to the Nominating Committee. Your input will be appreciated!

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 first in a series of "Presidents' Reflections," articles by past presidents of the AWM that are intended to help us consider what we want the organization to be at its 50th anniversary in 2021. As president-elect Ruth Haas said in her October 2018 AMS *Notices* interview, "It is time to take stock of where we are and what we should be doing going forward. The barriers to women in mathematics are different and often more subtle than they were 50 years ago. The AWM needs to continue to find ways to encourage and promote women in mathematics at all levels."

Mary Gray, author of the first reflection, was the first president of AWM as well as one of the early AWM volunteers whose "inexhaustible enthusiasm and inspiring example … set the standard for extensive donations of time and energy by those who followed."[1] That energy is suggested by the range of her experiences and accomplishments: a dissertation called "Radical Subcategories"; time at Oberwolfach, the mathematics institute in Germany's Black Forest; involvement in the Delano Grape Strike that increased pay for farm workers in California's Central Valley; work on Eugene McCarthy's presidential campaign; work in statistics; a suit against the Teachers Insurance and Annuity Association of America-College Retirement Equities Fund (TIAA-CREF) for sex discrimination—along with a law degree, which allowed her to write a brief when a related case came before the Supreme Court; national and international work in human rights; acquiring funding to support African American and Latino graduate students; and advising 34 PhD students. For more details, see Sarah Greenwald's interview with Mary Gray in the September 2016 issue of the *AWM Newsletter* and Gray's entries at MacTutor, Wikipedia, and the Agnes Scott College Biographies of women Mathematicians.

The Band of AWM

Mary Gray, American University

With thanks to Shakespeare (or maybe his sister), "We few, we happy few, we band of sisters. For she today who stands with me shall be my sister.… We in

[1] "AWM in the 1990s," http://www.ams.org/notices/19901/awm.pdf. See also, "A Brief History of the Association for Women in Mathematics: The Presidents' Perspectives," *Notices of the AMS 38*(7), reprinted in *AWM Newsletters 21*(6) and *22*(1), https://www.drivehq.com/folder/p8755087.aspx.

it shall be remembered." And we were few back when we decided to become a band, not exclusively of sisters, for there were men with us as well. There were advantages to being few—no queues at the restrooms and no claims that those of us who had good jobs had achieved them only through affirmative action, for there was no affirmative action then. As Ruth Bader Ginsburg said, quoting the abolitionist and feminist Sarah Grimké, "I ask no favors for my sex.… All I ask is that our brethren take their feet from off our necks." But there were comments such as this from a distinguished mathematician who came to an early AWM meeting to set us straight—"We once hired a woman at Chicago, but her research was not very good so of course we didn't hire another." And they didn't, not for many years, and there were others with the attitude that affirmative action is all well and good but if we have one woman in the math department, we certainly don't need another.

In that era, the saying was, "There have been only two women mathematicians but one was not a mathematician and the other was not a woman." In fact, there was a generation of women in mathematics in the US before us who just (with blinders on, as some of us thought) proved their theorems and raised their families. But some became leaders—Mina Rees, the first woman president of AAAS, Julia Robinson and Cathleen Morawetz, presidents of AMS—although that took longer. Gradually some of us took off the blinders and, noting the inequities that existed all around, decided something needed to be done, if not for us, then for the generations to come. I tended to take an aggressive stance for change, coming partly from my earlier efforts on social justice issues, while others more quietly organized in support. The southern graciousness of Alice Schafer won her an award for her efforts in organizing women in the Boston area and as the second president of AWM; however, the awards committee privately expressed the view that I was too pushy in seeking our goals. But no one asked me to serve the soup at communal meals at Oberwolfach, although I understand that happened to at least one of our successors.

My own blinders came off after several epiphanies. I had an epiphany in politics during the 1968 McCarthy campaign when I noticed that, once again, the men in the room had seized control of the volunteers. I threw the box of envelopes that I was stuffing across the table and left. My epiphany in mathematics had actually come my first day in graduate school when the instructor in my topology class pointed out to me that I was taking the fellowship that might have been more appropriately awarded to a man. It took me longer to recognize that as an inequity and to act on it, but you can bet I did very well in the course.

The early years of AWM were exciting for those of us who worked for equal rights in employment, in education, in health care. The scenes in the 2018 film *RBG* of Justice Ginsburg's role in early women's rights litigation were nostalgic but saddening, as I and some contemporaries asked why we were having to fight these battles all over again when we thought we had won at least some of them. Having just yesterday come from a meeting to support the outsourced dining and cleaning union employees at my campus, I recall ferrying supplies to the grape workers in the Central Valley in California in the 1960s, years before I decided that something needed to be done about inequity in my own

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CALL FOR PROPOSALS

Research Collaboration Conferences for Women

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

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

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

workplace and elsewhere—other than just abstaining from grapes. It took awhile for me to combine my roles as a statistician and as a lawyer, e.g., in analyzing TIAA pension plans with respect to sex discrimination, in order to learn how to use both most effectively.

Everyone seems to remember my forcing myself into a meeting of the AMS Council because I declared I was not bound by the "gentleman's agreement" that excluded non-members, but it's better to remember joining what had become a bigger band of sisters to get me elected to the Council and then as vice president in order to push our agenda for women in mathematics as one of the members. But the vineyard owners, TIAA, and even some members of Congress gave in more quickly than some male members of the mathematics establishment. Every time I brought up blind refereeing the response was "How would we know how good a paper was if we didn't know who wrote it?" I think of AMS as maybe the last bastion of this particular form of discrimination: judging a paper by its author, rather than by its content.

Over the years, I have been asked repeatedly why AWM has been so much more successful in many ways than have similar groups that grew up (and then often disappeared) in other disciplines. AWM has not only survived, but grown and expanded to offer a broad program of assistance and advocacy for women and girls at all levels. To me, that it was independent—run on a table top in my home with help from my husband and the female support staff at his institution (better resourced than mine) and without email (I know it is hard to remember when there was none)—meant we could organize as we pleased, take whatever positions we chose, and, frankly, have a good time getting together.

Another mark of success has been AWM's presence at meetings. For years, Hope Daly, the director of the AMS Meetings Department, was the indispensable key to insuring a visible presence for AWM at the annual mathematics meetings. Along the way, AWM was fortunate in attracting women accomplished at mathematics but also at organization and advocacy far beyond what we dreamed.

Now we are strong enough to afford to be closely associated with AMS, deriving administrative benefits while, we devoutly hope, maintaining our independence to continue the work that still needs to be done. Look for us among the prize winners, the department chairs, the featured speakers, the authors, the best paid in academe and industry. Justice Ginsburg is also known for her answer to "How many women should be on the Supreme Court?" "Nine."

CALL FOR NOMINATIONS

The 2020 AWM-Microsoft Research Prize in Algebra and Number Theory

The Executive Committee of the Association for Women in Mathematics has established the AWM-Microsoft Research Prize in Algebra and Number Theory. First presented in 2014, the prize will be awarded every other year. The purpose of the award is to highlight exceptional research in some area of algebra by a woman early in her career. The field will be broadly interpreted to include number theory, cryptography, combinatorics and other applications, as well as more traditional areas of algebra. Candidates should be women based at US institutions who are within 10 years of receiving their PhD, or having not yet received tenure, at the nomination deadline.

The AWM-Microsoft Research Prize serves to highlight to the community 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 Microsoft Research.

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 15, 2019**. If you have any questions, phone 401-455-4042 or email awm@awm-math.org.

2019 AWM Dissertation Prizes

Ebru Toprak and Jiuya Wang will be presented with AWM Dissertation Prizes at the AWM Reception and Awards Presentation at the 2019 JMM in Baltimore, MD.

Ebru Toprak obtained her PhD in 2018 from the University of Illinois at Urbana-Champaign under the direction of Burak Erdogan. Her work has been recognized through numerous awards, including the 2017 James D. Hogan Memorial Scholarship and the 2017 Waldemar J., Barbara G. and Juliette Alexandra Trjitznsky Fellowship, both from UIUC. Ebru is visiting the Mathematical Sciences Research Institute in Berkeley until December 2018. After her visit, she will join Rutgers University as a Hill Assistant Professor.

Ebru's research interests are in harmonic analysis and dispersive PDEs. Her dissertation provides new decay estimates for the potentials of the linear Schrödinger operator and of the linear massive Dirac operator in endpoint Lebesgue spaces setting, in dimensions 2 and 3 and under suitable assumptions on the threshold energies. Ebru's work has led to several publications, including the single-authored paper "A weighted estimate for two dimensional Schrödinger, matrix Schrödinger and wave equations with resonance of the first kind at zero energy," *Journal of Spectral Theory* 7 (2017), 1235–1284, and the paper "Dispersive estimates for Dirac operators in dimension three with obstructions at threshold energies," with B. Erdogan and W. Green, to appear in the *American Journal of Mathematics*.

Ebru Toprak

Her results are deemed "surprising"; her collaborators acknowledge that "[they] have benefited and continue to benefit greatly from working with [her]" and that she has already made "several important contributions on notably difficult problems in PDEs."

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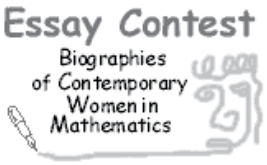
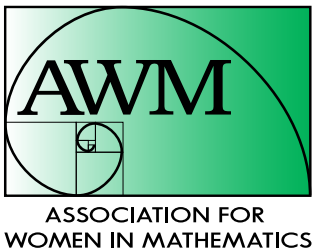


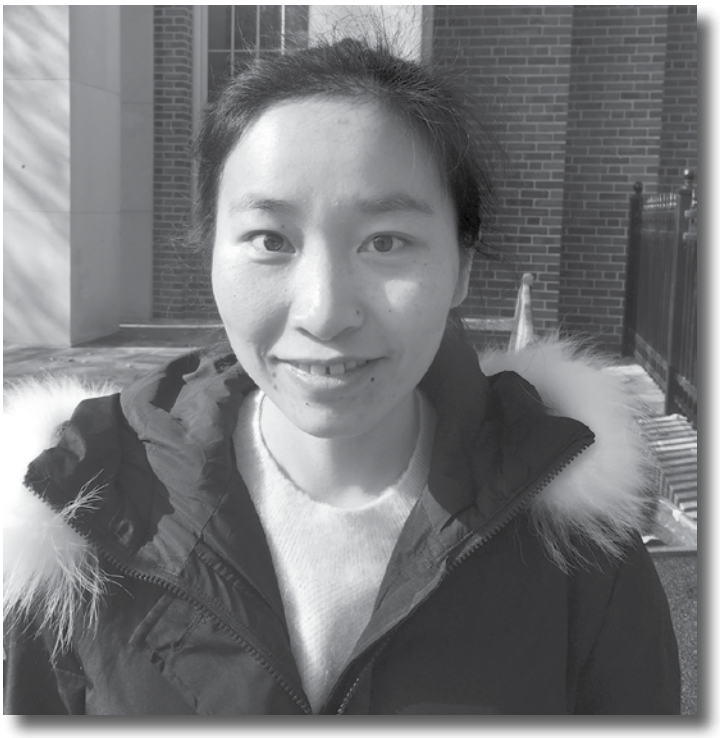
To increase awareness of women's ongoing contributions to the mathematical sciences, the Association for Women in Mathematics holds an essay contest for biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers. AWM is pleased to announce that the 2019 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 A*WM Newsletter*. For more information, contact Dr. Heather Lewis (the contest organizer) at hlewis5@naz.edu or see the contest web page: https://awm-math.org/awards. The deadline for electronic receipt of entries is **January 31, 2019.** (To volunteer as an interview subject, contact Dr. Joanna Bieri (interviewee coordinator) at joanna_bieri@redlands.edu.)



Jiuya Wang received her PhD in 2018 under Melanie Matchett Wood at the University of Wisconsin–Madison. She is now a Phillip Griffiths Assistant Research Professor and a Foerster-Bernstein Fellow at Duke University. She has received several honors and awards for her research and teaching contributions.

Jiuya works in arithmetic statistics, a branch of number theory. In her PhD thesis she proved Malle's conjecture for infinitely many non-abelian Galois groups. Malle had conjectured an asymptotic formula, which was later refined, for the number of degree n extensions K over Q with Galois closure having Galois group G. Malle's conjecture is still a central question in arithmetic statistics. The letter writers describe her work as "beautiful" and "impressive." One writes that her work "is a serious analytic accomplishment and I expect it to be published in a top number theory journal." Another writes "Dr. Wang also has many further ideas to use her unique mastery of these subjects, as developed in her thesis, to study related problems" and that "she has already made significant advances in these directions as well." The letter writers concur that her thesis demonstrates a high level of ingenuity, originality and technical mastery. In addition, they expect many applications to the field of arithmetic statistics from the methods she developed in her dissertation.



Jiuya Wang

The AWM Dissertation Prize was established in 2016, an annual award recognizing exceptional work in a dissertation defended in the preceding 24 months. The award is intended to be based entirely on the dissertation itself, not on other work of the individual. Learn more at www.awm-math.org.

NSF-AWM Travel Grants for Women

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

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

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

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

BOOK REVIEW

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

Reading About Ada: Children's Edition*

Gizem Karaali, Pomona College

Elena Favilli and Francesca Cavallo start their *Good Night Stories for Rebel Girls: 100 Tales of Extraordinary Women* (Timbuktu Labs, Inc., Canada, 2016) with "Once upon a time, there was a girl named Ada who loved machines." For those who want to learn more about Ada after this tantalizingly brief introduction, there is now a profusion of books that can help. Indeed, Ada's story beckons us all.

Augusta Ada Byron King Lovelace was born as Augusta Ada on December 10, 1815, in England. Her father was Lord Byron, one of the most famous poets of the time. Today most of us can cite at most a couple living poets off the top of our heads, but in those days, everybody who could read knew Byron, and it wasn't only because of his lyric poetry. Authors chronicling Ada's life compare Lord Byron to today's star actors and musicians. To fully comprehend the extent of his celebrity status, you need to take Elvis Presley, Che Guevara, and Roman Polanski, combine all their fame, charisma, attitude, and awe-inspiring talent, along with inappropriate and/or unlawful sexual scandals, and spread all of it onto the shoulders of Lord Byron as a cape. When little Ada arrived, everybody had already begun counting the days till she would go Daddy's way.

In short, Ada's life was meant for a soap opera audience from the beginning. Ada's mother fell head over heels for Lord Byron initially, but pretty soon after, she must have realized the mess she'd gotten herself into; about a year after their wedding, she departed with her month-old daughter to the house of her own parents. Lord Byron was an emotional man, and it seems that he was deeply heartbroken by this forced separation from his daughter. He wrote poems for her from faraway lands, asked for pictures of her in his letters, but never saw her again. And he ended up dying when Ada was eight. He was thirty-five. Lord Byron fits the saying perfectly: Live fast, die young, and leave a good-looking corpse.

But this is supposed to be about books about Ada so let's get back to her. Ada's childhood, lived far from her father, was mostly uneventful. Her mother encouraged her mathematical education, hoping thus to inoculate her to any wild genius tendencies she might have inherited from her father. (Of course, this makes sense; we all know mathematics is a calm, rational endeavor with no room for creativity.) Fortunately, Ada ended up really liking math, and she was good at it, too. A young girl of some means, she took private lessons on a range of topics, and besides mathematics, she was also very fond of playing the piano and horseback riding. It was not clear then which was her favorite.

As was expected of young women of her class, Ada married before turning twenty and had three children in rapid succession. Her husband soon became an earl, which made Ada the Countess of Lovelace. Along the way and afterwards, too, she got into trouble because she was too friendly with men who were not her husband, she lost a lot of money in horse-racing bets, and in 1852 at the age of thirty-five, she died of uterine cancer. As per her request she was buried next to her father.

By now, if you've never heard of her before, you might be wondering why Ada is in this newsletter. To get to that part of the story, we'll talk next about Charles Babbage.

Born in 1791 in England, Charles was a creative, stubborn, difficult man with novel ideas. He received a mathematics degree before Ada was born, and by the time she was a young girl, he had already made a name for himself as a quirky inventor. When they met in 1833, Ada was 17 and Charles was 41. But despite this age difference, they immediately warmed up to one another and a long-lasting friendship was born.

At the time Charles was working on a mechanical calculator. Exasperated by the many errors in centuries-old mathematical tables, he was convinced that a machine could calculate automatically and accurately the same values every single time. Despite her mother's efforts, Ada had a wild imagination and a creative streak, and thus was able to comprehend vividly the power of Charles' plans. Actually, she could see further than Charles: she could imagine that one day such a computing machine could compose music and create works of art. Computer scientists and historians of science are fascinated to read in her notes and her letters how Ada could envision the many capabilities of today's computers.

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* This is one of two reviews GK will be writing on books about Ada Lovelace. This first review focuses on books written for children. Books written for an adult audience will be explored in detail in the second review.

Her vision isn't the only reason for Ada's significance though. Charles' project was exorbitant and funding for it seemed highly unlikely to come about at the time. But it was theoretically sound, and its mathematical foundations were robust. And this leads us to Ada's most significant contribution to the mathematical sciences.

Ada wrote letters to Charles almost daily in the years 1842–1843. Their correspondence, which lasted until her death, reflects a warm and wide-ranging friendship. But during these two years, the letters are almost all about Charles' computing machine. Ada had decided to translate into English an article about the machine written originally in French, hoping to help garner respect and even financial support for the project. The original article was neither long nor detailed. Ada found herself adding more explanation and several worked examples to make sure the end result would convey the power and promise of the project. Her work went far beyond mere translation; her notes tripled, or rather, almost quadrupled the overall length of the article.

Among Ada's seven notes to the article, the most important one is Note G. Here we are told to imagine how far this machine can go though it starts with mere arithmetic. In order to impress the reader, Ada shows explicitly how the machine can compute the Bernoulli numbers, mathematically quite sophisticated constructs. That is, this note contains the complete implementation of an algorithm for the computation of Bernoulli numbers. In today's terms, this is a computer program. That's why Ada is famous today: She's the first known computer programmer in history!

After her death in 1852, Ada's name disappears from the scientific literature for almost a century. If we review the history of computation and the genealogy of today's computer, we don't see Charles' machine at all, except possibly in a footnote. Today's computers are the descendants, not of Charles and Ada's work, but rather, of the works of Alan Turing, famous also for deciphering the German Enigma code in the Second World War, and John von Neumann, one of the architects of the A-bomb as well as of quantum mechanics and game theory. But Charles Babbage and his collaborator Ada Lovelace are not really a part of this well-known storyline.

It was Alan Turing and his interest in the fundamental philosophical issues at the heart of the science of computation that brought Ada back to the limelight. In 1950, Alan penned an article about thinking machines titled "Computing Machinery and Intelligence," published in the philosophical journal *Mind*. This is where we see Ada's name reappear, decades after her death. Alan in his paper critiques a statement in Ada's Note G, what he calls Lady Lovelace's Objection. In today's terms, Ada claims that computers cannot create original thought, and Alan opens this up and complicates the notion of original thought, showing that the way our brains come up with thoughts isn't that different from the way computing machines do. Of course, readers of Alan's paper then start wondering: Who is this Lady Lovelace? Thus begins the modern mythology of Ada.

We're living at a time of many opportunities for people who can code. Today children of privilege begin playing with computers as toddlers. Attempts at leveling the playing field can involve coding camps as well as more traditional STEM-focused enrichment activities. Yet the

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) for details on eligibility and do not hesitate to contact Steven Ferrucci at 401-455-4042 for guidance.

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

computer science and engineering workforce remains heavily male-dominated. So proponents of women in STEM grasp at any loose end they can find to help alleviate the dearth of female role models. This is why we're seeing book after book written about Ada, the first woman who wrote a computer program. And she is not only the first woman who did that, but actually the first person ever. A neat win for the Girls Team!

I completely empathize with this desire to share Ada's story with younger people. And as a mother of a school-age daughter, I'm always on the lookout for books that can open up worlds of opportunity for girls of all ages. Hence I appreciated the opportunity to review several recent books on Ada written for the under-ten age group. The first three books I read belong to special series of books intended to encourage children to learn more about scientists and innovators and their contributions:

Ada Lovelace by Virginia Loh-Hagan (my itty-bitty bio) (illustrated by Jeff Bane)

Ada Lovelace and Computer Algorithms by Ellen Labrecque (Women Innovators: 21st Century Junior Library)

Programming Pioneer Ada Lovelace by Valerie Bodden (STEM trailblazer BIOS)

Loh-Hagan's book is for the youngest in the crowd. The book is narrated through Ada's perspective and the plain Ada illustration on the cover appears throughout; there is also a range of images from Ada's life. Though reading a sentence such as "I died in 1852" feels weird, the open-ended questions throughout try to connect the child reading the book (or being read to) to Ada's story. Though the story is much simplified, perhaps to the extent of not being completely accurate (Ada didn't "invent" the first computer program, she "wrote" it, and Charles didn't "invent the computer" as his work didn't connect with the actual historical development of computers), it is told in an age-appropriate way to inspire and intrigue.

Labrecque's book presents itself in a similar vein.

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CALL FOR NOMINATIONS

2020 M. Gweneth Humphreys Award

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

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

The nomination documents should include: a nomination cover sheet (available at https://awm-math.org/awards); a letter of nomination explaining why the nominee qualifies for the award; the nominee's vita; a list of female students mentored by the nominee during their undergraduate years, with a brief account of their post-baccalaureate mathematical careers and/or graduate study in the mathematical sciences; and supporting letters from colleagues and/or students. At least one letter from a current or former student of the candidate must be included.

Nomination materials for the Humphreys Award shall be submitted online. See the AWM website at www.awm-math.org for nomination instructions. Nominations must be received by **April 30, 2019** and will be kept active for three years at the request of the nominator. For more information, phone 401-455-4042, email awm@awm-math.org or visit www.awm-math.org.

BOOK REVIEW *continued from page 11*

Printed in a very large font, it could be read out loud with a new reader, and the occasional prompts to the reader sprinkled throughout can make this reading session more fun and engaging. This book goes into more detail about Ada and her contributions, and the reader is offered a clearer idea of what her life's work was about. Several color photos and images accompany the text and enrich the reading experience. A few follow-up resources and activities are suggested, and I could see an enthusiastic parent or summer camp instructor turning the book into a cool afternoon full of learning and fun.

At 28+ pages Bodden's is a book one could (or should!) find in any school library. This hardcover chapter book would be a neat resource for elementary school students trying to learn about Ada and her contributions; it could also be a great story to share with that special shy niece interested in mathy stuff. Many images throughout bring Ada's story to life. The section titled "Thinking Like a Man" openly brings up gender issues and could make a good conversation starter for pre-teens. This, I believe, is the most detailed and accurate account of Ada's story for the under-ten crowd.

Next are larger-format storybook-style books on Ada. Each of these would be great to read to or together with a young child; their beautiful illustrations will add much joy to the experience.

Ada's Ideas: The Story of Ada Lovelace, the World's First Computer Programmer written and illustrated by Fiona Robinson

Ada Byron Lovelace and the Thinking Machine by Laurie Wallmark (illustrated by April Chu)

Who Says Women Can't Be Computer Programmers? The Story of Ada Lovelace by Tanya Lee Stone (illustrated by Marjorie Priceman)

Ada Lovelace, Poet of Science: The First Computer Programmer by Diane Stanley (illustrated by Jessie Hartland)

None of these goes beyond Bodden's *Programming Pioneer Ada Lovelace* in terms of technical details, but the technical details that are included are dispensed in perfectly digestible amounts. This makes the books not only fun to read but also intellectually stimulating. Interestingly, they all seem to be fascinated by nine-year-old Ada's efforts to design and construct a flying machine; this plays an important role in each of the four books. The sheer beauty of illustration in each book also makes these great gifts for young children and the adults who enjoy reading with them. The expert illustrations range from the realistic (in Wallmark and Chu's *Thinking Machine*)

CALL FOR NOMINATIONS

The 2020 AWM-Sadosky Research Prize in Analysis

The Executive Committee of the Association for Women in Mathematics has established the AWM-Sadosky Research Prize in Analysis. First presented in 2014, the prize will be awarded every other year. The purpose of the award is to highlight exceptional research in analysis by a woman early in her career. Candidates should be women based at US institutions who are within 10 years of receiving their PhD, or having not yet received tenure, at the nomination deadline.

The AWM-Sadosky Research Prize serves to highlight to the community outstanding contributions by women in the field and to advance the careers of the prize recipients. The award is named for Cora Sadosky, a former president of AWM, and made possible by generous contributions from Cora's husband Daniel J. Goldstein, daughter Cora Sol Goldstein, and friends Judy and Paul S. Green and Concepción Ballester.

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 15, 2019**. If you have any questions, phone 401-455-4042 or email awm@awm-math.org.

to the whimsical (Stone and Priceman's *Who Says Women Can't Be Computer Programmers?*). Most play with the contrast of the poet's imagination with the mathematician's strict discipline, and all successfully combine the two in the end.

But what to do with that special little person who read several of these books and wants to know more about Ada? This will have to be a cliffhanger, because I will leave my evaluation of the grownup books to my second review. But let me tell you one thing: Whatever you do, don't jump into any random book about Ada with your youngster, without first reading it yourself (or skimming over my review of it in the next issue). Otherwise you just might find yourself, like I did, in some very awkward territory, where you need to either explain, or explain away, or simply skip through large portions of exposition, which go beyond PG-13. Yes, Ada's life is inspiring to children, but it also contains a lot of messy bits for the adults.

Indeed, it saddens me to acknowledge that children only get to hear part of Ada's story. Ada's life is complex, and as you immediately discover when you dig into the juicy details, she certainly didn't do everything right. She was ambitious and confident. She had vision and she had sass. She was also the person who wrote the very first computer program. But Ada is an ideal role model for more than just the above. Yes, she was brilliant. But she was also a failed genius, and this time, she is on our team. Except for her gender, Ada's story resembles the stories of any of those wild geniuses appreciated not only for their achievements but also for their larger-than-life personalities. And how many such stories do we have with female protagonists? How many others like her can you count? A female genius, who was brimming with potential and yet was mostly misunderstood and unappreciated during her time? An extraordinary figure, one who saw farther than her peers, one who basically squandered her voluminous talents because she was just interested in way too many disparate things? The standard simplified Ada story tells us that she was a genius who wrote the first computer program. A similarly simplified story could tell us alternatively that she ended up doing nothing impactful, that her work and that of Charles was not what led to today's computers, so that overall, she was a failure. Another simplified story could badmouth her mothering, her wifely skills, and her "loose attitude" with other men and tell us a tale of immorality in the grandeur of Victorian England. The story most people would choose to tell their children is the first one. However, for those children ready to take on a more complex persona and engage with her fully, some grownup books might help. And for that you will need to wait until the next review.

In the meantime, why not expand your little ones' horizons and introduce them to other amazing women? Here are three of my other favorites if you want a break from Ada:

Nothing Stopped Sophie: The Story of Unshakable Mathematician Sophie Germain by Cheryl Bardoe (illustrated by Barbara McClintock)

The Girl with a Mind for Math: The Story of Raye Montague by Julia Finley Mosca (illustrated by Daniel Rieley)

Counting on Katherine: How Katherine Johnson Saved Apollo 13 by Helaine Becker (illustrated by Dow Phumiruk)

And for neat collections of short bios, you will not go wrong with either of the two volumes of *Good Night Stories for Rebel Girls* by Elena Favilli and Francesca Cavallo; if you're especially rooting for math, don't miss the second volume, with its portrayal of Maryam Mirzakhani.

EDUCATION COLUMN

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

Revisiting: The Gates Foundation's Pivot on Improving K–12 Education

Jackie Dewar, Professor Emerita of Mathematics, Loyola Marymount University

In my November–December 2016 column (Dewar, 2016), "It's Complicated," I described how in its 2016 CEO letter the Gates Foundation (GF) had acknowledged that GF was facing the fact that "it is a real struggle to make system-wide change" (https://www.gatesfoundation.org/2016/ceo-letter). GF's original top-down approach to "fixing" K–12 education had not worked very well in terms of improving student achievement. I wrote that originally GF "thought smaller schools would be the solution; then it worked to change teacher evaluation and reward systems. Neither of these initiatives produced the desired results." Next, GF "provided financial support for the development of the Common Core State Standards and for the political fight to get the standards quickly adopted and implemented. That was problematic as well."

Meanwhile, Megan Tompkins-Stange, in her 2016 book *Policy Patrons*, saw GF becoming "more responsive to the voices of teachers, parents and community members" (https://www.insidehighered.com/news/2016/07/20/author-discusses-new-book-shifts-how-foundations-seek-shape-public-policy). So what is GF doing now?

According to a *Los Angeles Times* article (August 29, 2018), the latest round of GF funding ($92 million) will be used in school grants "to support educators doing work that has already shown progress" (Blume 2018). Bob Hughes, the GF's director of K–12 education is quoted as follows in the article: "We've come to understand how important context is. One size doesn't fit all." The types of initiatives being funded by GF in this round are quite varied and often involve creating networks of schools to collaborate and then share strategies and research. For example, a $619,000 grant will partner teachers and principals at five Los Angeles schools and five Chicago schools to work on improving 8th-grade math outcomes. See http://www.latimes.com/local/education/la-me-edu-gates-foundation-education-grants-20180828-story.html for more details.

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Blume, Howard. (2018, August 29). "Gates no longer looking for 'the one'." *Los Angeles Times*, p. B-2.

Dewar, Jackie. (2016, Nov–Dec). "It's Complicated." *AWM Newsletter*, 45(6), pp. 21-23.

Tompkins-Stange, Megan. (2016). *Policy Patrons: Philanthropy, Education Reform, and the Politics of Influence*. Cambridge, MA: Harvard Education Press.

MEDIA COLUMN

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

Equalities and Inequalities in *The Orville*

Laurie Zack, High Point University, and Sarah J. Greenwald, Appalachian State University

The Orville, created and written by Seth MacFarlane, is a science fiction comedy show from Fox (https://www.fox.com/the-orville/) inspired by the television series *Star Trek*. In "New Dimensions" (Season 1, Episode 11), which first aired November 30, 2017, the crew discovers a two-dimensional anomaly in space.

Mathematical ideas are sprinkled throughout the episode, including references to Edwin Abbott's book *Flatland* [1], the universal gravitational constant, and geometric differences between the second and third dimensions. The visualization of the two-dimensional world is done well. There are many vibrant colors, lines, polygonal shapes and bright spots moving around on these objects. At the same time Captain Ed Mercer talks to Commander and First Officer Kelly Grayson about inequalities in Abbott's *Flatland*. Mercer explains Abbott's society of two-dimensional polygons and their class structure. There is a subtle underlying reference here to a theme woven throughout the episode on how individuals get promoted and what success looks like.

We really liked that the episode features a lot of diverse groups working together to solve problems and that everyone

is portrayed as being interested in the mathematical theories. In a number of other instances of mathematics in popular culture there is at least one person who is impatient or even quite negative about any mathematical discussions (see for example [2] and [3]). That is not the case here. If we have any complaints about the episode it is that the characters who offer up new mathematical ideas mostly came across as male (gender is a bit complicated with some of the aliens). There are women in positions of authority such as Grayson and Alara Kitan, a Lieutenant and Chief of Security, but the women act as mathematical sounding boards. The gender inequity is most visible within the Science and Engineering Task Force, whose goals include understanding the space anomaly as well as building a quantum bubble to enter and exit two-dimensional space. Even though there are two women on the task force, they do not contribute to the mathematical discussions in any way. One notable exception, where a woman advances the scientific discussions, is in a meeting of the officers. Lieutenant Commander and Chief Medical Officer Dr. Claire Finn explains to the others that "Living cells are made out of protein molecules, which have complex three-dimensional geometries—how they react with other molecules is precisely controlled by their shapes."

[1] Abbott, E. (1884). *Flatland: A Romance of Many Dimensions*. London: Seeley & Co.

[2] Greenwald, S. (2018). "*Bones:* A Mathematical Retrospective." *AWM Newsletter* 48(1), 9.

[3] Greenwald, S. (2017). "WIMM Watch: *Blindspot*." *AWM Newsletter* 47(1), 9.

New NSF Funding Requirements

Courtney Gibbons, Assistant Professor of Mathematics, Hamilton College, member of the AWM Policy & Advocacy Committee

My mathematics genealogy poster hangs in my office, and it's fun to watch my students trace my academic lineage up through Klein, Gauss, Euler, Leibniz, and up the tree through Copernicus and other great minds of the 15th century. But I have mixed feelings about keeping the poster hanging on my wall. To my knowledge, there are no people of color on the poster. The first woman to appear on it is a 21st century mathematician: me.

Institutional progress is slow, and we all have our part to do to urge it along. Occasionally these little pushes add up to real change, and the NSF's newly announced harassment and sexual assault policy is, finally, a significant step forward for institutional change. What's big about the NSF's new policy? It requires that institutions place NSF-funded personnel on administrative leave if they are found to have harassed or assaulted someone—or else the NSF can revoke its funding.

The policy comes two years after the 2016 NSF statement reaffirming its commitment to inclusivity in science in which it states:

> In light of recent, multiple reports of sexual harassment in science, NSF reiterates its unwavering dedication to inclusive workplaces. NSF does not tolerate sexual harassment and encourages members of the scientific community who experience such harassment to report such behavior immediately.[1]

In the same year, the NSF (along with other federal and private funding agencies) funded a project titled "Sexual Harassment in the Scientific and Technical Workforce and its Effects on the Careers of Scientists, Engineers, and Medical Professionals."[2]

The recent 2018 policy clarifies NSF's expectations for awardee institutions and charges the NSF Office of Diversity and Inclusion (ODI) with keeping resources accessible online by describing a three-step process: new award requirements, harassment-free research workplaces, enhanced web resources. These steps are described by Rhonda Davis, the Office Head of the ODI, in her statement to Congress. Her statement also includes a principled stand.

> As the primary funding agency of fundamental science and engineering research in the United States, NSF recognizes that to enable scientists,

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[1] "The National Science Foundation (NSF) will not tolerate harassment at grantee institutions" retrieved 10/29/2018 from https://www.nsf.gov/news/news_summ.jsp?cntn_id=137466

[2] "NSF Award Abstract #1644492" retrieved 10/29/2018 from https://nsf.gov/awardsearch/showAward?AWD_ID=1644492

NEW NSF FUNDING REQUIREMENTS

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> engineers and students to work at the outermost frontiers of knowledge, the agency must be a role model for teamwork, fairness, and equity. NSF does not tolerate sexual harassment, or any kind of harassment, within the agency, at awardee organizations, field sites or anywhere NSF-funded science and education are conducted. Investing in science, engineering, and education for the Nation's future necessitates a safe environment that fosters equal opportunity for all.[3]

The NSF itself also provides a fact sheet about the new requirements on its website.[4]

New award requirements dictate that awardee institutions notify the NSF if a PI, co-PI, or other person linked to a grant has committed harassment, including sexual harassment, or sexual assault. The policy also requires that awardee institutions place the PI or co-PI on administrative leave in these circumstances or during investigations into harassment or sexual assault charges. As part of the new requirements, the NSF reserves the right to revoke funding or require replacement of grant personnel to ensure the safety of all parties in the scientific workplace under the aegis of the grant.

The NSF also describes in more detailed terms its expectations for harassment-free research workplaces, namely that "clear and unambiguous standards for behavior" are communicated to all personnel in the research environment. The individuals in the research environment, including students, should also be told the channels and processes for reporting harassment or sexual assault.

Finally, the ODI is developing enhanced web tools for awardee institutions, including a portal for accessing policies, procedures, best practices, and frequently asked questions. The portal can be accessed through the link https://www.nsf.gov/od/odi/harassment.jsp.

What does all this mean for our community of mathematicians? First off, this policy means harassing individuals are required to change their behavior to retain funding, and their home universities are required to collect data and report on this data. At our home institutions, we can use the NSF policy as a standard to which we hope all of our colleagues are held, regardless of their roles on campus.

[3] "Testimony of Rhonda Davis, Office Head, Office of Diversity and Inclusion, National Science Foundation, before the Subcommittee on Research and Technology of the Committee on Science, Space, and Technology, U.S. House of Representatives, February 27, 2018" retrieved 10/29/2018 from https://science.house.gov/sites/republicans.science.house.gov/files/documents/HHRG-115-SY15-WState-RDavis-20180227.pdf

[4] "Fact Sheet. NSF: Next steps against harassment" retrieved 10/29/2018 from https://nsf.gov/news/news_summ.jsp?cntn_id=296671

CALL FOR NOMINATIONS

2020 Louise Hay Award

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

The nomination documents should include: a one to three page letter of nomination highlighting the exceptional contributions of the candidate to be recognized, a curriculum vitae of the candidate not to exceed three pages, and three letters supporting the nomination. It is strongly recommended that the letters represent a range of constituents affected by the nominee's work. Nomination materials for the Hay Award shall be submitted online. See the AWM website at www.awm-math.org for nomination instructions. Nominations must be received by **April 30, 2019** and will be kept active for three years. For more information, phone 401-455-4042, email awm@awm-math.org or visit www.awm-math.org.

To help make these changes, we can learn a lot from the recent National Academies of Sciences, Engineering, and Medicine (NASEM) report.[5] The AWM has a discussion group that is currently working through this report and gathering examples from across universities to share out with AWM. So here is our homework:

(1) Make ourselves familiar with what behaviors constitute sexual harassment and help our departments to understand this as well. The NASEM report highlights that creating a civil workspace by eliminating the more "casual" forms of gender harassment greatly prevents escalation to more heinous acts.

(2) Within our institutions, use the NSF "line in the sand" on grants to open the discussion about what escalating punishments our university has for violators who may not have NSF grants. Then we can refer our administrators to the NASEM report for guidelines to structure fair institutional practices.

(3) Please share your home institution's current practices and policies with the AWM so that we can compile (and then share out to our membership) meaningful policies for various universities. Email what you find to AWM Executive Director Karoline Pershell (karoline@awm-math.org) and she will direct it to the group.

For now, I'll keep my genealogy poster on the wall: it's a reminder that the world has changed since Copernicus's day. Change does (eventually) happen, and our continued, shared work results in policy changes on many scales—including at large institutions like the NSF.

[5] "Sexual Harassment of Women: Climate, Culture, and Consequences in Academic Sciences, Engineering, and Medicine (2018) Consensus Study Report" retrieved 10/30/2018 from https://www.nap.edu/24994

AWM Town Hall Meeting at MathFest 2018

Alejandra Alvarado, U.S. Navy, and Karoline Pershell, AWM Executive Director

The AWM Town Hall Meeting at the 2018 MathFest, "Shaping and Fostering an Equitable Community in our Departments," was a meaningful time for community members to examine university structures that may make it difficult for some to advance in their careers. The goal of this session was to compile a list of best practices for creating and sustaining an equitable department community, and we modeled our session after the 2013 MathFest Town Hall Meeting: "Minority Participation in Math" (maa.org/news/maa-mathfest-2013-town-meeting-on-goals-for-minority-participation-in-mathematics.) An excellent discussion ensued and ended with sharing how some departments have (or will) address the issues we saw.

Departmental Service. Departmental service should be looked at through the lens of behavioral economics. Faculty make budgetary decisions on how they spend their time based on a myriad of factors, for example, personal value systems or their interpretations of the department's expectations and value systems. Much too often, departmental expectations are not clear regarding service, and a faculty member's interpretation of departmental expectations or values may be flawed. The result may then be that some faculty take on more service than others because they believe that their service will be valued in a way that it may not be (for example, towards tenure). Departmental service is often an unfair system, where experienced individuals can game the system (e.g., "if I don't reply to the email, the chair will ask someone else to do it"), many rules are not codified, and rules that are codified haven't been examined to see how they influence or perpetuate an unfair system (e.g., how seniority affects service assignments). Those who do not know how to game the system (e.g., those who are new or those who mistakenly believe the system to be "fair" and are therefore susceptible to requests from a department chair) tend to become unfairly overwhelmed with service work, thus having less time for other scholarly activities.

Unfortunately, so many departments are not aware of the unfairness of their systems or how they affect the faculty because they attribute the unevenness to the individual's personal value system (e.g., "Well, she volunteered for all of these committees and agreed to advise twice as many students as others when I asked her, so obviously she

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must want to do this"). Departments ought to codify their service requirements and the distribution of those service requirements so that this process is transparent.

To begin, chairs could address the following questions about the role of service in their department:

- How much service is there for the full department to cover?
- What are the term limits, e.g., of university-wide committee appointments?
- How is each service commitment weighted? Is it based on the time commitment, or something else?
- How does the department intend to weigh specific service tasks in the tenure process?
- Are service commitments fairly balanced among faculty? If not, why not, and how could they be better balanced?

If a department has a team mentality it will be easier to "reduce the burden of additional and race-specific forms of service placed on scholars of color."[1] Transparency of expectations is important so that early career and minority faculty (e.g., those who may not understand the system or feel less empowered to question the system) know if they are being asked for greater time commitments compared to other faculty members. More than just the faculty, the chair should be aware if certain faculty are being asked to carry a greater amount of service commitments than others and question why that is, and whether other balances could be implemented, such as a teaching load reduction.

Activities that Support New Faculty. Regarding early career faculty, below find some suggestions specifically for the department chair to protect new faculty who do not yet understand the department's needs:

- If the department is small, new faculty may have to teach multiple new courses. Either the department chair should try to allow for teaching repeat lower level courses or assign upper level courses that are offered yearly.
- A rotation system for courses should not be based on seniority.
- Keep track of service and how much of a time commitment it requires in order to help keep the amount of service by all, equitable.
- Maintain a full list of service tasks and who is doing each, so as to make it more visible how the work is distributed and ensure that assignments that should count, do.
- Regarding tenure and promotion, faculty groups (of three) should discuss progress with new faculty, including reviewing the new faculty's service commitments *in comparison to the rest of the department*.
- Create teaching groups that observe each other and provide informative informal feedback.
- Student evaluations are known to be biased. Therefore, it is reasonable to include self-reflection on teaching and discussions with those being observed for teaching (pre and post observations).
- Communicate clear expectations about what it means to be teaching, particularly with respect to student-centered pedagogies and an understanding of whether the observing faculty have different teaching priorities (e.g., more traditional views).
- Every department wants to diversify its committees. Thus, underrepresented populations are more likely to be asked to participate in more service, since there usually are not many to begin with. It is important to assign someone (perhaps the chair) to help them say no, or say no for them. A chair can be effective in helping protect underrepresented minority (URM) faculty's time so that they can focus on activities that will aid them in earning tenure. An idea is for universities to hire minority cohorts, not only for the benefit of the students, but to diversify the campus. We recognize this could be difficult to do if the surrounding area is not as diverse.

This Town Hall recognized that departments want to bring in fantastic candidates, but that more work can be done about how to *retain these faculty* once they are in a department. Additional structures to aid new faculty in becoming anchored in their departments and aware of university expectations are:

- Pair junior and senior faculty members to work together on a course or attend a workshop, particularly if they share similar research or teaching interests.
- Provide new faculty members with two mentors: one from the same department and one from a different department. These faculty should have insight to pass on regarding promotion and tenure expectations, which should serve as a safety net in case the information is not passed on through more formal channels by the chair, as discussed above. Having a mentor outside the department who is not involved with promotion decisions will also

[1] Eric Anthony Grollman, *Invisible Labor,* https://www.insidehighered.com/advice/2015/12/15/column-about-exploitation-minority-scholars-academe," retrieved 25 November 2018.

provide another perspective and the ability to discuss any potential issues without having to worry about repercussions.

The 2018 AMM MathFest Organizing Committee is Alejandra Alvarado (chair), U.S. Navy; Candice Price, University of San Diego; Farrah Jackson Ward, Elizabeth City State University; and Cassie Williams, James Madison University. Interested in continuing these discussions? Volunteer to join AWM's MathFest Committee and plan the 2019 Town Hall! For more information, email awm@awm-math.org.

AWM Conflict of Interest Policy

A conflict of interest may exist when the interest (financial or other) or concerns of any member of AWM, or the member's immediate family, or any group or organization to which the member has an allegiance or duty, may be seen as competing or conflicting with the interests or concerns of AWM.

When any such potential conflict of interest is relevant to a matter requiring participation by the member in any action by AWM or any of its committees to which the member belongs, the interested party shall call it to the attention of AWM or the committee and such person shall not vote on the matter. Moreover, the person having a conflict shall retire from the room in which the organization or its committee is meeting (or from a conference call) and shall not participate in the final deliberation or decision regarding the matter under consideration.

The foregoing requirements shall not be construed as preventing the member from briefly stating her position in the matter, nor from answering pertinent questions of other members, as her knowledge may be of great assistance.

The minutes of the meeting of the organization or committee shall reflect when the conflict of interest was disclosed and when the interested person did not vote. When there is a doubt as to whether a conflict of interest exists, and/or whether a member should refrain from voting, the matter shall be resolved by a vote of the organization (or its committee), excluding the person concerning whose situation the doubt has arisen.

A copy of this conflict of interest statement passed by the AWM Executive Committee, Vancouver, 8/16/1993, shall be published once a year in the *AWM Newsletter*, and any member serving as an officer or on a committee shall be advised of the policy upon undertaking her duties.

CALL FOR NOMINATIONS

The Association for Women in Mathematics Student Chapter Awards

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

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

Eligibility: Any chapter may nominate itself for awards in at most two of the four categories.

The nomination should include: 1) A cover letter: The cover letter should summarize the chapter's qualifications for the award category to which it is nominating itself. If the chapter is applying in two categories, it should ensure that both categories are clearly included in one cover letter. 2) An activities report: The activities report, 500–1000 words in length, should give a detailed description of the particular work for which it is seeking an award. If the chapter is applying in two categories, a separate activities report is required for each. Nomination materials should be submitted online at MathPrograms.org. The submission link will be available 45 days prior to the nomination deadline. Nominations must be received by **April 15, 2019**. If you have questions, phone 401-455-4042, email awm@awm-math.org, or visit www.awm-math.org.

Inaugural Women in Operator Algebras Workshop a Success

Dawn Archey, University of Detroit Mercy

Background

In November 2018, 36 women in operator algebras met at the Banff International Research Station (BIRS) to collaborate in small groups on open research problems in the field. The workshop was a success by any metric: research questions were refined, theorems were proved, and professional networks were extended and strengthened.

Operator algebras is a very active branch of functional analysis. Its rich yet rigid structure admits a powerful general theory. Operator algebras have important applications to quantum mechanics, number theory, dynamical systems, and ergodic theory. Unfortunately, even compared to other areas of mathematics, operator algebras has suffered from a severe gender imbalance. Only 11% of authors posting in the operator algebras subject of the ArXiv are women, the second lowest of any mathematical subject on the ArXiv.*

In light of these low participation numbers and inspired by previous "Women in …" workshops such as Women in Number Theory, Astrid an Huef (Victoria University of Wellington), Sarah Arklint (University of Copenhagen), Karen Strung (Radboud University), and Dilian Yang (University of Windsor) applied to hold the first Women in Operator Algebras Workshop at the Banff International Research Station (BIRS). The application was successful, and BIRS provided all accommodation and meals, and very good working facilities. We also received some funding towards the cost of travel for some participants from the NSF-HRD 1500481–AWM ADVANCE grant and from the Compositio Foundation. We are very grateful for all the support we have received.

Prior to the workshop, the women organized themselves into teams focusing on a research question to which they could contribute. The research groups were:

"Quantum majorization in infinite-dimensional Hilbert Space," led by Sarah Plosker with participation by Priyanga Ganesan, Sasmita Patnaik, and Emily Redelmeier.

"Nuclearity of C*-algebras of quasi-lattice ordered groups," led by Astrid an Huef with participation by Brita Nucinkis, Camila F. Sehnem, and Dilian Yang.

"Equilibrium states on semigroup C*-algebras and groupoids," led by Nadia Larsen and Zahra Afsar with participation by Anna Duwenig, Carla Farsi, and Judy Packer,

"Weyl groupoids and Cartan subalgebras for twisted k-graph C*-algebras," led by Elizabeth Gillaspy and Sarah Reznikoff with participation by Rachael Norton and Sarah Wright.

"Twisted groupoid algebras and Cartan subalgebras," led by Lisa Orloff Clark with participation by Becky Armstrong, Kristin Courtney, Ying-Fen Lin, Kathryn McCormick, and Jacqui Ramagge.

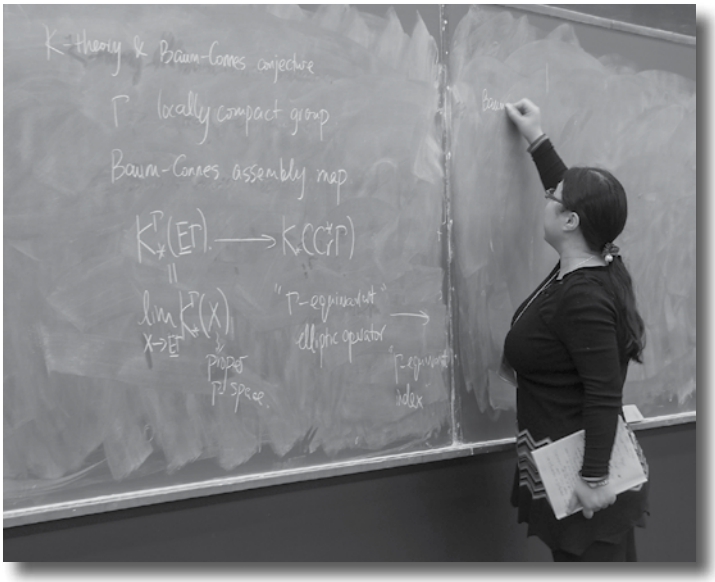
"Generalized crossed products and large subalgebras," led by Dawn Archey and Karen Strung with participation by Maria Stella Adamo, Magdalena Georgescu, Ja A Jeong, and Maria Grazia Viola.

"Index theory and K-theory with applications to arithmetic groups," led by Maria Paula Gomez Aparicio and Hang Wang with participation by Sara Azzali, Sarah Browne, and Lauren Ruth.

"Quantum principal bundles and their C*-algebras," led by Francesca Arici and Chiara Pagani with participation by Erin Griesenauer.

Nadia Larsen speaking on semigroup C-algebras*

* Abra Brisbin and Ursula Whitcher, "Women's Representation in Mathematics Subfields: Evidence from the ArXiv." https://arxiv.org/abs/1509.07824



Hang Wang explaining the project she will lead

Most of the workshop was spent working in these small groups, but on Monday and Friday each small group gave a ten minute presentation to all participants on their project and progress.

Research on napkins really does happen

Participants also took advantage of the location for a group hike up Tunnel Mountain and a visit to a current art installation by Young Joon Kwak at the Banff Center called "The Cave" which works with the themes of the man cave, the body, heteronormative culture, and national parks. One evening was devoted to a group discussion facilitated by Carla Farsi (University of Colorado, Boulder), Ying-Fen Lin (Queen's University Belfast), and Jacqui Ramagge (University of Sydney) on the issues faced by women in mathematics in general and in operator algebras in particular.

Several of the groups were so pleased with their progress and prospects for future success that they have already made arrangements to meet again.

Magdalena Georgescu on Tunnel Mountain with her husband and daughter

Happy hikers at the top, Tunnel Mountain excursion

Participants at SSAWM-2017

Symposium for South Asian Women in Mathematics

Overview of SSAWM-2017

Dhana Kumari Thapa, Tribhuvan University, dhanathapam@gmail.com; from an activity report submitted to the funding agencies

The first ever of its kind, the Symposium for South Asian Women in Mathematics (SSAWM-2017), was held at the Central Department of Mathematics Tribhuvan University (TU), Kathmandu, Nepal, on October 12–15, 2017. The program was initiated by the relatively new Women of Nepal in the Mathematical Sciences (WoNiMS) group, who also made up the local organizing committee. Dhana Thapa (TU), who started WoNiMS, was the main organizer of the Symposium. She was assisted by co-organizers Sara Faridi (Dalhousie) and Sylvia Wiegand (Nebraska). The participants and speakers at the symposium included 45 women from Nepal (9 were undergraduate students at TU) and 25 women from 11 other countries (Bangladesh, Canada, France, India, Indonesia, Italy, Japan, Korea, Pakistan, Philippines, USA). In addition, many faculty members and dignitaries from TU and neighboring institutions attended many of the events. The aims of the symposium were: to promote scientific communication in mathematics; to establish a mathematical network for sharing and communicating with women mathematicians, experts and organizations with similar goals in this region; and to bring together leaders of professional organizations for women working in mathematical sciences, particularly in mathematics teaching, research and mathematics education. Another goal of the symposium was to strengthen and create opportunities for women in mathematics in Nepal and motivate undergraduate Nepalese students, especially girls.

At the Opening Ceremony of the symposium, Asha Koirala, Nepal's Minister for Women, Children and Social Welfare, expressed her belief that this program would improve gender equity in the mathematical sciences in Nepal. She committed her office to working with WoNiMS to create a supportive environment for developing the leadership of women in the mathematical sciences. The Rector of TU, Prof. Dr. Sudha Tripathi, expressed her happiness on seeing such a big event organized by the newly formed women mathematics group; she believed the symposium would encourage women mathematicians to succeed in their own endeavors as well as perform leading roles in the academic arena at the university and in society.

Participants interacted with each other and shared their research work in both pure and applied fields of

The conference banner

mathematics. Altogether 39 papers in applied math, algebra, number theory, analysis and math education and 9 posters were presented in different sessions of the four-day symposium.

Four panel discussions were conducted by panel members representing the various countries and professional organizations: 1) Women in math, 2) Math education and outreach, 3) Research success and path to PhD, and 4) Mathematical organizations. These discussions were led by Sara Faridi (Canada), Sunsook Noh (Korea), Francine Diener (France) and Dhana Thapa (Nepal). There were two breakout group sessions on women in math and professional development in math and discussion. Views, experiences and insights from different scholars, professional organizations' activities and countries were shared among participants. They discussed how to support and promote researchers and professionals in the respective countries and exchanged experiences with outreach activities for female students. At the end of the symposium a gigantic list of resources and possible funding agencies filled a blackboard.

The speakers in the panel on Women in Mathematics gave their personal experiences as mathematicians from ten different countries.

At the closing session of the symposium, after a discussion of "Where do we go from here?" a volunteer committee was formed including Sylvia Wiegand (USA), Aihua Li (USA), Sara Faridi (Canada), Sunsook Noh (Korea), Dhana Thapa (Nepal), Suchitra Bajracharya (Nepal), Riddhi Shah (India) and Geetha Venkataraman (India) in order to assist the WoNiMS group in organizing academic and professional activities in the future. This committee will seek ways to help Nepali women who would like to do advanced research work in mathematics.

The symposium has inspired and motivated Nepalese women participants to organize professional development activities in the future. WoNiMS has a plan to disseminate the information and documents related to our fields through the website. WoNiMS gained confidence and capacity from this event, and plans to implement some of the suggestions obtained from the symposium and develop proposals for women in mathematics about more activities.

Acknowledgment: The SSAWM 2017 organizing team would like to express their most sincere thanks to the following organizations for their contributions to this symposium: International Mathematical Union-Committee for Women In Mathematics (IMU-CWM), European Mathematical Society-The Committee for Developing Countries (EMS-CDC); Foundation Compositio Mathematica; Atlantic Association for Research in Mathematical Sciences (AARMS); Dalhousie University; Roman Number Theory Association (RNTA); Mathematical Sciences Trust, Nepal (MST, Nepal); Sukunda Pustak Bhawan; and Lions Club International District 325 A2.

Common Ground

The following article about the AARMS-supported conference Symposium for South Asian Women in Mathematics was written by Sara Faridi (Dalhousie University) and is reprinted with permission from CMS Notes *(Volume 50, No. 2, March–April 2018)*

What unites us as mathematicians is our love of mathematics. It goes beyond our personal, national or cultural identities. Some of us are attracted to the grand open problems, some to the glorious past, some to the intriguing puzzles, and some to the art of sharing it with enthusiastic students. In a way, mathematics is a culture of its own within which we mathematicians live. Unlike so many others, we are paid to inhabit a world we love.

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A typical mathematical event is multicultural, but one can easily be blind to that because the math culture takes over, and people are often focused on a narrow field. The excitement of sharing our interests shrouds our differences.

This can slightly change if you visit a math department in a different country and immerse yourself in that department's culture. Each department does things a bit differently. Perhaps they have different lunch routines. However, there are many similarities: there are seminars, colloquia, students, exams and defenses, poster boards announcing upcoming conferences and interesting problems to think about. No matter how exotic the new land, the math department is an island offering the comforts of home. Just like Starbucks, you can trust it to be the same the world over!

At a recent meeting of Women in Mathematics in Nepal, I had a completely different experience. I had already been to a conference at Tribhuvan University in Kathmandu the previous year and had enjoyed the conference, the people, and the country immensely. During that meeting, the local female mathematicians approached the female conference participants for help in professional development. The prospects for female Nepalese mathematicians, they said, were limited at best.

It seemed natural to want to help, so some colleagues and I decided to organize a conference in Kathmandu inviting women mathematicians from Southeast Asian countries (who are culturally similar to the Nepalese) to share their own experiences of mathematical life: obstacles they have had to overcome, motivation of students and outreach, where to look for opportunities, roads to success, and so on.

We spent the next year planning, fundraising and writing to people. Most places we applied to were happy to support the event financially, and we managed to reach out to a large body of women: many from Nepal and neighbouring countries, and several more from Europe, the US, Japan, Korea and Canada.

The event was a success, we met our goal. We even made it to National TV!

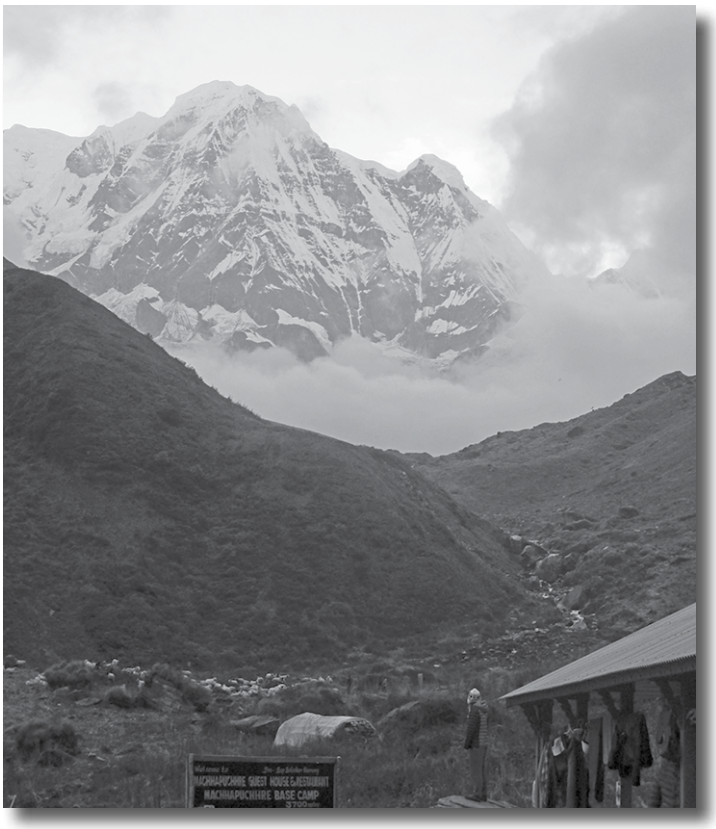
We talked about mathematics and being mathematicians, and once again, after much effort to get everyone together, we were in the familiar setting of a mathematics conference.

But this time things were different: the dominant culture was not that of mathematics, but that of the region, dictated by geography and by cultural norms. The women from the region shared their stories of what it took them to do mathematics. While for me, mathematics was a choice of many fields I made in high school, for them it was a change of destiny and a breaking of all sorts of cultural barriers. Many successful female mathematicians from this area were wives, daughters-in-law, and mothers first, and mathematicians in their very limited spare time. Some picked their life-partners with a view of who would most be able and willing to support their mathematical career. Many women typically completed each degree after completing a family phase (children going to school, children getting married). There were women well into their forties who were contemplating their next academic degree.

The experience was humbling, and the obstacles faced by our colleagues seemed insurmountable.

As we planned the banquet dinner, we thought we should share some motivational stories with these women, about the journeys of female mathematicians in the previous century and their hardships, to smoothen their rocky road.

The Nepalese women disagreed. What we perceived as a rocky road was normal life for them, and the fact that we were there looking for ways to make things better warranted a celebration. It was a party after all, and there ought to be a talent contest! So we put all things in perspective and spent the evening singing and dancing and celebrating our common love of mathematics in their way, and according to the cultures of the region.



Annapurna

Origins, Funding ... and Mountains in Nepal

Sylvia Wiegand, with help from Roger Wiegand, both of University of Nebraska–Lincoln

"Why Nepal?" To be honest, it started with the mountains. Then the mathematics and the women. Every trip Roger and I've made has included some vigorous exercise in the mountain regions of Nepal. We've climbed Goyko Ri and done extensive treks on the Everest Base Camp route and also on the Annapurna Circuit. We've had gorgeous views of Everest, Annapurna, Fishtail and Amadablam. In 2018 the adventure recounted below continued with our trek of the "Three passes," and math talks and a meeting with WoNiMS.

Ajaya Singh, a math professor at Tribhuvan University, first introduced Roger and me to mathematicians and mountains in Nepal in 2014. He invited us to give algebra talks at Tribhuvan. Nobody knew much algebra, so we just tried to communicate the beauty of the subject, omitting elaborate technical details. The audience was receptive, and Ajaya convinced us to organize the First International Workshop and Conference in Commutative Algebra (FIWCCA) in Nepal, held at Tribhuvan in April 2015. FIWCCA attracted mathematicians from the Czech Republic, India, Italy, Korea, UAE, and USA.

On April 25, the last day of FIWCCA, at 11:56 a.m., four minutes before the scheduled end of the last morning talk, a magnitude 7.8 earthquake struck. Over 10,000 people died. Miraculously, all 60 participants of FIWCCA escaped safely. (If we had been physicists, a canopy above the door of the nearby physics building that collapsed in a huge pile of rubble would have killed us. Fortunately the physicists were on holiday.) The Nepali students were wonderful; they escorted us to an empty field near the math building, then to a lovely buffet lunch at 2 p.m. (in a tent). After four scary days (64 aftershocks in the first 24 hours!) of camping outside, dropping to the ground during major aftershocks, and avoiding buildings, we managed to catch a flight home. But the memories have stayed with us: how the Nepali students and all the people there were so kind and helpful, how they took care of us, and how they made sure we were safe.

Since that occasion, Roger and I have adopted Nepal and Nepal has adopted us. We have been there nine times in the past five years.

Every May since 2016 we have taught Galois theory to graduate students for two weeks as part of the Nepal Algebra Project (NAP). (Francesco Pappalardi (Roma III) and Michel Waldschmidt (Paris) organized and secured funding for NAP, a six-year program (2016–2021) of graduate courses on fields and Galois theory, divided into five two-week modules.)

In October 2016 Roger and I organized the Second International Workshop and Conference in Commutative Algebra (SIWCCA) in Nepal at Tribhuvan, with a stellar cast from Austria, Canada, France, Iran, Romania, Saudi Arabia, UAE, UK, USA. There were 25 speakers; eight were women, including Sara Faridi and Janet Striuli.

Meanwhile Dhana Thapa and other women in mathematics in Kathmandu had established WoNiMS, for "Women of Nepal in the Mathematical Sciences." At SIWCCA, the WoNiMS group and the eight women speakers of SIWCCA had a very productive session getting to know each other and brainstorming plans for a symposium for women in mathematics in Kathmandu. We all thought the symposium was a great idea, but that it would take a lot of planning and funding and applying for grants, and so we should aim for sometime in October 2018 or so.

We contacted the Committee on Women in Mathematics (CWM) of the International Mathematics Union (IMU). They were interested in supporting such conferences in developing countries. It was a shock to learn, however, that

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they wanted proposals to be in by early January 2017 and they wanted the symposium to be sometime in 2017. I had contracted a horrible case of pneumonia in early November that lasted a month and a half. My first reaction was: This is impossible! However, Dhana took it all on and made a wonderful proposal to the CWM with Sara and Janet's help. Sara has amazing grant-writing abilities and found generous funding from Canadian sources, to support both local participants and women from western countries who would be presenting talks, and from other sources suggested by Francesco and Michel.

The SSAWM Symposium for Southeast Asian Women in Mathematics, held October 12–15, 2017, was an emotional and life-changing event for all of us there. Women came from Bangladesh, Canada, France, India, Indonesia, Italy, Japan, Korea, Pakistan, Philippines, and the USA. The women of Nepal are keen to study mathematics and to help each other achieve their dreams. Many of them want to get PhDs and we have formed a committee to help them. We outsiders felt we really connected with them, showed them what is possible and gave them confidence in themselves as women.

Although getting visas for the US has been a stumbling block, we hope to bring Nepali students to the US and other countries to discuss research with scholars. We welcome other members to join the committee and to bring ideas for helping women in Nepal study mathematics.

Changed Perceptions

Adriana Salerno, Bates College

It's been almost a year since I went to Kathmandu, Nepal, for the first time. As with most of my travel these days, it wasn't for tourism, but for a math conference. This, however, was a very special conference, one for South Asian Women in Mathematics.

Every time that I attend one of these conferences where I meet mathematicians from "the other side" of the world, I'm immediately struck by all the things that make us different and that there is even more that brings us together. I should be used to these contrasts as a Venezuelan who immigrated to the United States, and as the descendant of many generations of immigrants, but I am happy to say I am often still surprised by everything I have yet to learn.

I was pleasantly surprised by the level of the mathematical talks and posters, the candor and honesty of the panels, and the depth and curiosity of the questions. I was also blown away by the optimistic and solutions-focused tone of a lot of the conversations. One preconception I came with was that because marriage and motherhood was a priority for women in this region (and yes, I'm pretty sure I was the only single and childless person over the age of 30), it would be much more difficult for them to pursue mathematics. In some ways I could see it is very difficult, but I saw a lot of drive and focus in all of these women—they were much less interested in thinking about how they got to where they were, and much more so in figuring out solutions for moving forward and inspiring the younger generations of women. They would have as many ideas as they did questions and were not looking at us foreigners as role models but as allies in the struggle. It is hard to describe how lovely that was.

We also had beautiful and pure moments of connection, like the visit to the "monkey temple," where I bought some Tibetan prayer flags that I still have on my balcony, or the impromptu dance party at the end of the banquet, or the quiet moments during breakfast where we would share our personal stories.

I have to credit the organizers, Sara Faridi, Dhana Thapa, and Sylvia Wiegand, for how well this whole event went. But I think we also need to give credit to all the regional participants for embracing this event with all their hearts. I can't wait to see how they change the world.

Maya Chhetri, Professor and Director of Graduate Studies at UNC Greensboro, originally from Nepal, giving an inspiring talk, "Population dynamics model with harvesting," in which she described her journey as a mathematician

MATHEMATICS + MOTHERHOOD

Interview with Melody Chan

Lillian Pierce, the Nicholas J. and Theresa M. Leonardy Associate Professor of Mathematics, Duke University

Melody Chan is a tenure-track Assistant Professor at Brown University, working in combinatorial algebraic geometry. She earned her PhD in 2012 at UC Berkeley.

Melody Chan

M+M: Tell me a bit about the math you're doing.

MC: Well, I work in combinatorial algebraic geometry and tropical geometry. This is a modern degeneration technique in algebraic geometry: it brings techniques from combinatorics to bear to study old questions about the geometry of polynomial equations. But I also like the connections to other areas that I've found in my work, like topology and computations.

M+M: Now, professionally speaking, what has been your career path to this point?

MC: I got my PhD in 2012 from UC Berkeley and was an NSF Postdoc at Harvard for three years before starting my job at Brown on the tenure track in 2015. Right now I'm on a year-long junior sabbatical of sorts, trying to get a lot of work done before coming up for tenure in not too long.

M+M: I heard you are also teaching a component of a new year-long sequence at Brown, part of an experiment with a new way of teaching first-year math majors?

MC: Yes! It is a very exciting new class, called Introduction to Higher Mathematics, and I'm lucky to be part of the teaching team for the first two iterations. It introduces students to six core topics of higher mathematics: logic, combinatorics, analysis, number theory, algebra, and geometry. I had a lot of fun developing the combinatorics module last year. The idea is to provide a new way into the major that doesn't necessarily proceed through semester after semester of calculus, and gives a taste for what math is like, and some of the beautiful results in it.

I wasn't involved with the course proposal itself, much, but I am really in support of new ways to get students excited about math, and the great thing is that (if done properly) there should be no need to have taken advanced mathematics in high school. This has nothing to do with BC Calc. It's also good for the students to get to meet six faculty members in the department right away.

M+M: When we first met, we were both early in our graduate school days. Now we both have families. I'd be interested in how your family has developed alongside your career.

MC: Well, my wife and I met in our first year of graduate school, and we graduated in the same year so the timing worked great on that! She is not an academic, so she was able to move with me across the country to the Boston area for my postdoc. She now works for the state government. While I was a postdoc we started thinking seriously about having a child. We are lucky in that Boston has a community health center, Fenway Health, which has a special focus on LGBT health and advocacy, and has a long-running program to help LGBT people become parents. (I'm not 100% sure about this but I think initially and for a while, sperm could only be provided to a woman married to a man in a couple having difficulty conceiving. Things have changed!) We started the whole process during the last year of my postdoc—that was right after I signed my job offer at Brown, which meant that we could continue to live in the Boston area, and in fact my wife got to keep her very same job, which was all very lucky. My wife got pregnant during the following year—also very lucky! Our baby was born in the summer after my first year of my tenure-track job. For the first couple months we did almost nothing other than take care of the baby. (Though I do remember typing out the last few edits on a grant proposal late one night with one finger while holding the baby in the other arm!)

Everyone in my department has been incredibly supportive. My school has a one-semester parental teaching relief policy, which I took in Fall 2016—and it has an automatic

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(opt-out) one year tenure clock extension. I'm actually glad about the opt-out instead of opt-in. As a mathematician you might think they are equivalent, but psychologically they are very different, for yourself and for everyone else too. I thought it was an advantage when talking about it with people.

M+M: That's interesting, that an automatically granted tenure clock extension is easier to accept, psychologically. It's also good, because it would apply even if someone doesn't know to ask for it. Are there other programs the university runs that have helped during this time?

MC: Back-up childcare, contracted through Bright Horizons, helped us through a difficult period over the winter when my child was sick a lot and I was getting really behind on work. I'm sure that this is a privilege of teaching at a (relatively) well-off school. Even department colleagues who had kids say ten years ago were envious—the program didn't exist then.

M+M: What about a program you wish existed, to help young parents during the early faculty years?

MC: I feel like the main challenges are around the structure of academia itself, and that I am relatively lucky on all fronts. But, I wish there weren't postdocs, which feel like you are suspended in time. I wish the tenure system weren't so frontloaded, so that everything matters crucially right at the start. Maybe we need a system more like the UK. Also, I think that having a baby is one of the life events where people seem to be *the most* understanding. What about other things that don't fit into a known category: taking care of a parent or spouse? It all comes down to the absurd situation of having to evaluate a person's long term potential for contribution on a few hectic years in their 30s.

M+M: I'm interested in whether you found you had the role models you would have wanted as you were thinking ahead to starting your family, right at the same time you were starting a brand new phase of your career.

MC: To be honest: yes I have had plenty of role models. This interview made me think about that question, because at first I thought "Well, I'll suggest someone else for the interview," much like I would for a declined referee request. Then I realized: I don't know ANYONE else who is a queer female parent with a career in mathematics research! That helped me think, "Well, I have to do this."

But at least for me, the LGBT thing and how it interacts was a nonissue. It was quite clear to me, from a small but sturdy sample, that you can be a parent and have kids as a young assistant professor, and make it work, and still be badass. In retrospect, Lauren Williams was a big positive influence—she came to Berkeley in my second year of grad school—it only occurred to me years later that she was the first female math professor I had up until then—ever! (And possibly also the only female math professor I've *ever* had, now that I think about it!) But also, there were people closer to peers, such as Elena Fuchs, Karola Mészáros, and actually you!

Mostly separate from parenting, there were a couple of times when I found myself in a unique position on the job market. I had to be "out" to department chairs, for example, in instances when it mattered (such as explaining my interest and needs in a particular out-of-the-way location). Awkward! At one institution, a wonderful department chair explained that there's no school policy for parental leave, but he would simply work something out with me, no problem. It was really great that he brought it up on his own and I didn't have to. But there's only a finite extent that a department can insulate you from the larger school culture—or for that matter the culture of the city and the region. I do wonder in retrospect, for example, how it would have been in the context of that school where, I was recently informed, there is still a policy for its student dorms that bars overnight guests of the opposite sex. How would it be to be a queer woman equally co-parenting, but not herself the birth mother of, a newborn child, asking for parental leave there?

M+M: That's such an important question, and hard to answer until you have taken the job and are experiencing the environment. In addition to parental leave policies, many job candidates can be affected by the awkwardness of having your employer determine your healthcare coverage. Some universities have policies that forbid the distribution of any birth control method on university property. If that university provides its most affordable health coverage through its medical school, for example, a candidate may worry whether their family members will have access to standard birth control. What could departments do to make it easier for prospective hires to figure out what care is actually available? For example, to make it possible to tell how well the university healthcare plans support LGBT health? These aren't exactly questions it's easy to raise as a job candidate.

MC: If each school were able to establish a quick guide to how health insurance and parental leave interact with parenting/adoption and LGBT parenting/adoption, that would be helpful, as opposed to piecing it together from the HR websites. (But again I have been lucky on this myself.)

M+M: Time and again, I realize that while I know of a few simple things that really help a gestational parent or a lactating parent deal with professional travel, because that is

my lived experience, I wouldn't accurately guess what would be spot-on in terms of helping a mathematician + X, where X maybe: is transitioning, is adopting a child, has an immigration difficulty, has a disability, works overnight shifts, or has dementia. I am wondering how a homogeneous community, which would like to become more diverse, can anticipate and provide flexibility for experiences that may not have been present within a particular department before—because as you pointed out with the tenure clock extension, it is so much easier to accept an option that is pre-structured, rather than to ask for it individually.

MC: That's a really good point. At the last AGNES conference [a series of weekend workshops in algebraic geometry] we had a conversation where it was pointed out that departments just having documents online explaining how things would work in various circumstances would be helpful. Like, "So, you're a graduate student and want to have a baby? Great, here's what you need to know." It occurs to me that some of this stuff is really not so much about math and therefore one could join forces profitably with other departments, say.

M+M: We, and our institutions, need to work conscientiously to glean information from many people in order to learn what we can do to move to a more diverse future. Thank you very much for telling us about your recent experiences navigating queer parenthood and your path to a tenure-track job! I really appreciate your participation in this interview.

2019 AWM Research Symposium Poster Session

The Association for Women in Mathematics invites graduate students and recent PhD recipients to give a poster presentation at the 2019 AWM Research Symposium at Rice University in Houston, Texas on April 6–7, 2019. This meeting will also feature 3 plenary talks, 31 special sessions on a wide range of topics in the mathematical sciences, a banquet, and opportunities for discussion and networking.

OPEN TO: Graduate students and recent PhD recipients in the mathematical sciences.

APPLICATION DEADLINE: January 31, 2019. Applications should be submitted at MathProgams.org: https://www.mathprograms.org/db?apply-9-739

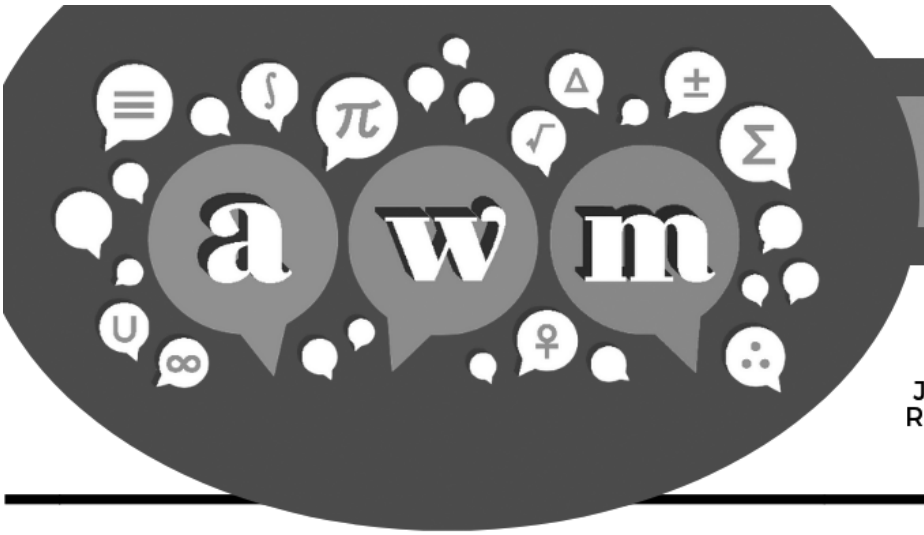
FUNDING: Partial support for most participants, both US citizens and non-US citizens, is available.

ELIGIBILITY: Applications are welcome from women who have received their PhDs within approximately the last five years and from graduate students who have made substantial progress on their doctoral thesis.

ALL APPLICATIONS SHOULD INCLUDE:

- A cover letter
- Curriculum vitae
- Title and abstract (no more than 1 or 2 paragraphs)
- A *brief* letter of recommendation from a faculty member or research mathematician who knows the applicant's research. In particular, a graduate student should have a letter of recommendation from her thesis advisor.

Late applications and/or recommendation letters cannot be accepted. Decisions on applications are expected to be made by February 15, 2019.



ASSOCIATION FOR WOMEN IN MATHEMATICS

RESEARCH SYMPOSIUM

April 6-7, 2019
Rice University

Join us for the 4th biennial AWM Research Symposium showcasing research from women in the mathematical professions!

- 3 general audience plenary talks
  - Sue Brenner - Louisiana State University
  - Kristin Lauter - Microsoft Research
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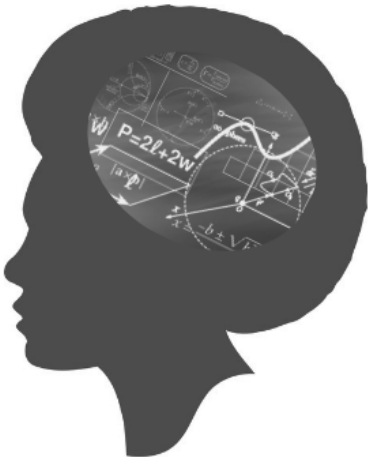

For more information and to register:
https://sites.google.com/site/awmmath/home/RS17/RS19

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Submit to the AWM Poster Competition!

AWM is soliciting applications for a new poster competition. Submissions should tell the public about our mission, our outreach, our advocacy, and our members. Individuals or student chapters can submit a poster by filling out this form:

https://goo.gl/forms/9HkAl3FQymTSWybK2

Prizes will be awarded for best posters in the categories of visual impact, information dissemination, advocacy, and event promotion (to be used as a template for upcoming events). The contents may include aspects of the history of math, recreational math, diversity in math, and past AWM events. Top choices will inspire a new AWM poster collection to be available free online. Applications are due **February 1, 2019**.

Association for Symbolic Logic Student Travel Awards

The ASL offers modest student travel awards through its NSF grant to graduate students in logic to attend the 2019 ASL North American Annual Meeting in New York, New York, the 2019 Logic Colloquium in Prague, Czech Republic, and the Sixteenth Asian Logic Conference in Astana, Kazakhstan. These awards are available to US citizens and permanent residents as well as to international students enrolled at US universities. You do not need to be an ASL member to apply for these awards. Air travel paid for with NSF funds must be in compliance with the Fly America Act.

Applications for the 2019 ASL North American Annual Meeting are due February 15, 2019 and should be submitted by email to the Program Chair, Wesley Holliday at wesholliday@berkeley.edu. Details for applying for student travel awards to the 2019 Logic Colloquium (https://lc2019.cz) and to the Sixteenth Asian Logic Conference (http://www.alc2019.kz) will be posted when they become available.

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

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

For further information about these meetings, visit aslonline.org/meetings/

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Northwestern University—Ralph Boas Assistant Professorships—Applications are invited for Boas Assistant Professorships at Northwestern University. The Boas Assistant Professorships are three-year, full-time, non-tenure-track positions beginning September 1, 2019, with a teaching load of four quarter courses per year. Applications are invited from qualified mathematicians in all fields. Candidates should have met all requirements for a Ph.D. by September 1, 2019. 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, (4) a separate narrative statement on teaching, and (5) four letters of recommendation, one of which discusses the candidate's teaching qualifications in depth. Inquiries may be sent to: boas@math.northwestern.edu . The review process starts **December 1, 2018**; applications arriving after this date will 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.

Northwestern University—Lecturer in Mathematics—Applications are solicited for a 3 year lectureship starting September 1, 2019. This is a non-tenure track, full-time position with a teaching load of six quarter courses per year. We invite applications from qualified mathematicians in all fields and the primary criterion for selection is teaching excellence. Preference will be given to those candidates whose teaching and research interests are compatible with current faculty. Candidates should have met all requirements for a Ph.D. by September 1, 2019. 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, (4) a teaching statement, and (5) four letters of recommendation, one of which discusses the candidate's teaching qualifications in depth. Inquiries may be sent to: boas@math.northwestern.edu. Review of application materials will begin on **January 1, 2019** and will continue until the position is filled. 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.

Northwestern University—RTG Postdoctoral Fellowships in Analysis—Applications are invited for RTG Postdoctoral Fellowships in Analysis at Northwestern University, in conjunction with the Mathematics Department's NSF Research Training Groups grant in Analysis on Manifolds. The RTG Postdoctoral Fellowships are three-year, full-time, non-tenure-track positions beginning September 1, 2019, with a teaching load of three quarter courses per year. Candidates should have met all requirements for a Ph.D. by September 1, 2019 but should be within two years of Ph.D. as of January 1, 2019. Only US Citizens and Permanent Residents are eligible for these positions. Candidates are invited in all areas of analysis. 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: boas@math.northwestern.edu. The review process starts **January 1, 2019**; applications arriving after this date will 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.

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