

ASSOCIATION FOR
WOMEN IN MATHEMATICS

Newsletter

VOLUME 50, NO. 4 • JULY–AUGUST 2020

The purpose of the Association for Women in Mathematics is

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

IN THIS ISSUE

2 Presidents' Reflections

5 Riehl Wins Birman Research Prize

6 Berger Named Kovalevsky Lecturer

8 Student Chapter Corner

9 Book Review

12 Education Column

13 Conference on Data Science

16 Mathematics + Motherhood

20 Melnick Receives Birman Fellowship

21 Programs That Make a Difference

PRESIDENT'S REPORT

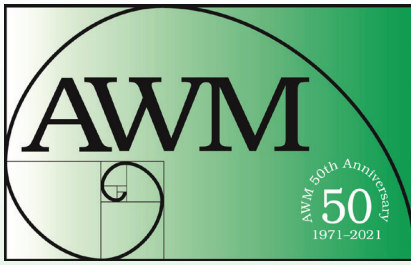
I'll try not to make this report all about bad things getting worse. But here's the thing, a lot of inequality has been made worse during this crisis. For example, the American Association of University Women (AAUW) reports that women average higher student loan debt than men (\$22,000 vs. \$18,800). Black women and first-generation college students typically hold even more debt when they finish their undergraduate degrees. As women still earn less than men, it generally takes them even longer to pay back these loans (and then start saving for buying a house, having kids or retiring). All this was true pre-covid. Recent unemployment data shows women filing 59% of new claims, while they represent only 50% of the labor force. This will make their loan situations even worse.

The situation in academia is disconcerting. The *Chronicle of Higher Education* has several recent articles about employment at colleges and universities. There were 19,200 fewer employees (faculty and staff) at colleges and universities in March 2020 than in February 2020. With tremendous budget shortfalls and uncertainties many colleges and universities have canceled hiring, cut adjuncts and generally pared back instructional staff (along with all other staff). Those who remain may face furloughs or pay cuts. We all know that women mathematicians are more often part-time lecturers or adjuncts and so more likely to be under- or un-employed in the coming academic year.

You may have heard about the surge of math and science papers hitting the arXiv and other preprint servers recently—but more often authored by men! Several recent articles confirm that women are not submitting as much. (See the Education Column for related info.) A recent article in *Nature* asks the question “Are women publishing less during the pandemic?” The article presents data from several science preprint servers (including arXiv) which point to yes. A headline in the *Washington Post's The Lily* reads: “Women academics seem to be submitting fewer papers during coronavirus.” These articles suggest that a reason for this is that women continue to do the major share of housework and childcare. Of course during the pandemic, families are all at home. And while it's a first-world problem, households that had previously paid house cleaners and ate out a lot have been fending for themselves in those areas too. Women are often more likely to be attentive to needs of family and friends they are not living with, and making extra phone and video calls to check in with their extended networks.

What can we hope will be better after this? Here's what I hope: many of us have been productive working from home, even with kids running around. Maybe workplaces will continue to let us work from home more and be more flexible with schedules. My university is a commuter school located on an island. We've

continued on page 2



ASSOCIATION FOR WOMEN IN MATHEMATICS

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

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

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

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PRESIDENT'S REPORT *continued from page 1*

been forced to start on-line tutoring rooms, and those will be a great benefit for all our students going forward. Even for campuses that are mostly in person, the few commuting students and returning women students with children will benefit from increased on-line access to resources. Students are still clamoring for the in-person experience! Just as records (and CDs and streaming services) have not replaced live concerts, people continue to feel some learning is best done in the actual company of others. So I do not believe we are seeing the end of the campus experience as we know it.

Many careers will be changed because of events this year. It is more important than ever to reach out to our younger colleagues and our students and support them in making life choices which nurture them. Let us advocate for our profession, and for women in our profession. And, let us advocate for our profession to evolve to value and support the choices we want to make in our lives.

How are you? What have you been doing with your time? What do you need and how do you think the AWM can help shape the healing? AWM's policy and advocacy committee has put together a web page (<https://awm-math.org/covid-19>) with links to resources and a place to share your thoughts. As always, I appreciate hearing what's on the minds of our members. I look forward to hearing your thoughts and working with our community.

Ruth Haas
May 25, 2020
Mānoa, HI



Ruth Haas

PRESIDENTS' REFLECTIONS

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

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

Chuu-Lian Terng was the twelfth president of AWM (1995–1997). Her article mentions ninth president Jill Mesirov (1989–1991). For more about Terng and Mesirov, see their Wikipedia entries and web pages <https://www.math.uci.edu/~cterng/> and <https://medschool.ucsd.edu/about/leadership/Pages/jill-mesirov.aspx>.

Reflections of Chuu-Lian Terng, 1995–1997

When my good friend and former AWM president, Jill Mesirov, asked in late 1993 whether I would be willing to serve as AWM president from 1995 to 1997, I was very surprised that the nominating committee would ask me, since I had not been involved much in AWM and had a quite different cultural background. Although I have long been aware of the difficulties women mathematicians face, when I was younger I felt it better to ignore these difficulties and just work hard to be my best. But I was aware that many AWM members had contributed much time and effort to improve the climate for women mathematicians and I realized that I had benefited from their hard work, so I felt an obligation to take my turn working for AWM. Thus, even though my parents had taught me not to be outspoken and not to stand out, I accepted the position and tried to give it my best.

It was also in 1994 that I started a research project with Karen Uhlenbeck on integrable systems, and she asked me to co-organize the Mentoring Program for Women Mathematicians at the Institute for Advanced Study. I was amazed to find that I, who had previously done so little for women in mathematics, was suddenly called to work on two such important programs. Karen and I jointly ran the Mentoring Program from 1994 to 2010, and we became quite close working on both the program and on joint research. This program, which has changed its name to Women in Mathematics, is currently run by Sun-Yung Alice Chang, Dusa McDuff, and Margaret Readdy, and has just received the 2019 AMS Programs that Make a Difference Award.¹

The year 1996 was AWM's 25th anniversary, and one highlight of the celebration was the three-day Julia Robinson Celebration of Women in Mathematics Conference at the Mathematical Sciences Research Institute (MSRI) in Berkeley. This conference was both successful and fully attended. My first job after my PhD degree was an instructorship at UC Berkeley from 1976 to 1978. I remembered getting a note in my mailbox stating that Julia Robinson would be appointed as a tenured professor at UC Berkeley around 1977. She had taught part time at Berkeley for years and had done outstanding research, yet she was only offered a tenured position after being elected to the National Academy of Sciences. But she was very modest and not at all bitter.

During the time I was an instructor at UC Berkeley, the atmosphere for women was far from ideal. So it was very fortunate that I was part of the friendly and supportive differential geometry group led by S. S. Chern, and I realized from this experience that it was highly important for women to have good mentors in the early stages of their careers in mathematics. As a result, in 1997 I submitted a grant proposal to NSF Program Director Lloyd Douglas, who was very supportive of women in mathematics, to establish the AWM Mentoring Travel Grants for Women program. I am highly pleased to see that this program is still running today.

My two years as AWM president went smoothly, due to the invaluable help of former AWM presidents, the many women mathematicians who volunteered their time, and the dedicated work of the AWM coordinator Dawn Wheeler and executive director Joanna Wood Schot. Although AWM had several programs

¹ <https://www.ams.org/journals/notices/201905/rnoti-p769.pdf>.

continued on page 4

Membership Dues

Membership runs from Oct. 1 to Sept. 30

Individual: \$70 **Contributing:** \$160

Family, new member, and reciprocal

(first two years): \$35

Affiliate, retired, part-time: \$30

Student, unemployed: \$20

Outreach: \$10

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Institutional Membership Levels

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Category 2: \$325

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Regular and contributing members living in the US may elect to receive a print version of the *Newsletter*. Libraries, women's studies centers, non-mathematics departments, etc., may purchase a subscription for \$75/year. Back orders are \$20/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 Administrative Specialist, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the Newsletter must be Affirmative Action/Equal Opportunity designated.* Institutional members receive discounts on ads; see the AWM website for details. For non-members, the rate is \$130 for a basic four-line ad. Additional lines are \$16 each. See the AWM website for *Newsletter* display ad rates.

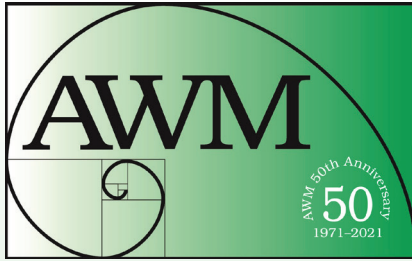
Newsletter Deadlines

Editorial: 24th of January, March, May, July, September, November

Ads: Feb. 1 for March–April, April 1 for May–June, June 1 for July–Aug., Aug. 1 for Sept.–Oct., Oct. 1 for Nov.–Dec., Dec. 1 for Jan.–Feb.

Addresses

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



ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM ONLINE

The *AWM Newsletter* is freely available online.

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

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

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AWM DEADLINES

RCCW Proposals: July 1, 2020
AWM Workshop at JMM:
August 15, 2020
AWM-AMS Noether Lecturer:
October 1, 2020
AWM-SIAM Sonia Kovalevsky Lecturer:
October 1, 2020
AWM Alice T. Schafer Prize:
October 1, 2020
AWM Dissertation Prize:
October 1, 2020
AWM Travel Grants: October 1, 2020
and February 1, 2021
Ruth I. Michler Memorial Prize:
October 1, 2020

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PRESIDENTS' REFLECTIONS *continued from page 3*

sponsored by grants from several different agencies, the grants provided no unrestricted operating funds for the office, so we also had a fund-raising drive as part of AWM's 25th anniversary celebration in 1996.

At that time the AWM office was just a single room in the mathematics department of the University of Maryland although it had over 4500 members and many on-going programs. Dawn and Joanna handled the office work, Dawn and Bettye Anne Case coordinated all the AWM meetings, and Anne Leggett edited the *AWM Newsletter* (and has been a wonderful editor to this day). It was a miracle that although AWM did not (and still does not) have enough unrestricted funds, all its activities ran fairly smoothly.

I remember Dawn was energetic, dedicated, and sometimes emotional, and Joanna was calm and helpful. I was sad to learn from the January newsletter that Joanna passed away a year ago and was moved to hear that she left AWM a very generous bequest in her will.

I put up a primitive AWM website as part of my own site at Northeastern University in 1996. What a difference from the current website, which is so professionally done, informative, and easy to use! I have had a lot of enjoyment from it, looking up back issues of the newsletter and learning what is going on.

I moved to UC Irvine in 2004 and, since UCI is on a quarter system, it has been difficult for me to attend the annual Joint Mathematics Meetings in January. Also, I feel it is important for younger women to become involved in AWM activities, so I have not done much volunteer work for AWM since that move.

Yet UCI has benefited from the activities of AWM. For example, we had a successful Sonia Kovalevsky Math Day several years back with over 150 participants from local schools. And there is a UCI Noetherian Ring for women mathematicians (now run by Alessandra Pantano), and, since last year, an AWM student chapter.

I learned from the AWM website that membership is now about 3500, down from 4500 in the mid-1990s. Could this be because there is no longer as much open sexism, and so people feel that AWM is less necessary? I would argue that's not the case given that many of us often hear in private conversations people saying that: there is too much pressure from the administration to hire more women, it is much easier for women to get jobs, we have tried so hard to hire women but with little success, we have three women faculty so we do not need to worry about hiring more, etc. Yet, as Lenore Blum mentioned in her reflection, the percentage of tenured women faculty in doctorate-granting institutions is still only in single digits, perhaps only three percentage points more than 25 years ago.

AWM has contributed greatly to the improvement of the status of women mathematicians in the past 49 years. As we celebrate its 50th anniversary, I hope that more women will go into mathematical sciences, become AWM members, make donations, and volunteer their time to work for AWM.



ASSOCIATION FOR
WOMEN IN MATHEMATICS

You can renew your membership at
awm-math.org

Emily Riehl Wins AWM–Birman Research Prize



Emily Riehl; Photo credit: Liz Flyntz

AWM will present the fourth AWM–Joan & Joseph Birman Research Prize in Topology and Geometry to Emily Riehl, Associate Professor of Mathematics, Johns Hopkins University, at the Joint Mathematics Meetings in Washington, DC in January 2021. Established in 2013, the AWM–Joan &

Joseph Birman Research Prize recognizes exceptional research in topology and geometry by a woman early in her career. The biennial presentation of this prize serves to highlight to the community outstanding contributions by women in the fields of topology and geometry and to advance the careers of the prize recipients. The award is made possible by a generous contribution from Joan and Joseph Birman.

Citation

The 2021 Joan & Joseph Birman Research Prize in Topology and Geometry is awarded to Emily Riehl for her deep and foundational work in category theory and homotopy theory.

Riehl has proved many fundamental theorems in category theory and its relations to homotopy theory and has produced a large body of exceptional research as well as expository and pedagogical work. Her work is transforming the ways we work with higher categorical objects, drawing on classical category-theory tools and constructions to illustrate and simplify higher categorical constructions. Riehl's theorems and machinery beautifully showcase how these higher categorical constructions can often be viewed as intuitive generalizations of the ordinary ones. Her books on category theory and on homotopical category theory have become the standard references, and her draft book on ∞ -categories is already finding immediate use by researchers.

Riehl is an internationally recognized scholar for her important research works in category theory and her innovative ideas about mentorship and communication of mathematics.

continued on page 6

NSF-AWM Travel Grants for Women

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

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

Eligibility and Applications. Please see the website (<https://awm-math.org/awm-grants/travel-grants/>) for details on eligibility and do not hesitate to contact awm@awm-math.org or 401-455-4042 for guidance. Applications from members of underrepresented minorities are especially welcome.

Deadlines. There are three award periods per year. Applications are due **February 1, May 30, and October 1.**

AWM-BIRMAN RESEARCH PRIZE *from page 5*

Riehl received her PhD in 2011 from the University of Chicago and was a Benjamin Peirce Postdoctoral Fellow and an NSF Postdoctoral Fellow at Harvard University from 2011 to 2015. Riehl is currently an associate professor at Johns Hopkins University and is spending the spring term of 2020 as a Chern Professor at the Mathematical Sciences Research Institute in Berkeley where she co-organizes a semester-long program on Higher Categories and Categorification.

Response from Emily Riehl

I am deeply honored to have been selected for the 2021 Joan & Joseph Birman Research Prize in Topology and Geometry and acutely grateful to the selection committee for recognizing higher category theory and abstract homotopy theory as topology metamorphosed.

I am lucky to have fallen in love with mathematics at an early age and even more fortunate to have received such fantastic mentorship at every step along the way. I am particularly grateful to Benedict Gross, who inspired and then catalyzed my undergraduate forays into teaching; Martin Hyland, who roused my aspirations to think categorically; Peter May, my PhD advisor and preeminent editor, who showed me what it takes to write well; Mike Hopkins, who initiated me into the profession and moves me with the kindness he shows to so many who look up to him; and especially to my colleagues at Johns Hopkins

who have gone above and beyond time and time again to support me in every conceivable way: Nitu Kitchloo, Jack Morava, David Savitt, and Steve Wilson. Finally, I'd like to acknowledge the generosity of the algebraic topology community, who have drawn me in from the periphery and made me feel as if we were all a part of a common enterprise. For instance, through the wonderful Women in Topology network, I and many others can count the senior luminaries in the field—Kathryn Hess, Brooke Shipley, Kristine Bauer, and Brenda Johnson—among our treasured collaborators and friends.

I am excited to be one of many contributors to a field of mathematics that is undergoing a rapid evolution. I like to daydream about what infinite-dimensional category theory will look like from the other side, perhaps where a univalent foundation system allows us to treat equivalence as equality and recognize sets as one layer of an infinite hierarchy of homotopy types, recording the higher structures that may be borne by these equivalences.

The 2021 Joint Mathematics Meetings are currently scheduled for January 6–9, 2021 in Washington, DC. The JMM will take place on location, virtually, or in a hybrid format. Plans may change during these uncertain times. See www.ams.org for updates. For further information on the AWM–Joan & Joseph Birman Research Prize, please visit www.awm-math.org.

Bonnie Berger Named Kovalevsky Lecturer

AWM and SIAM have jointly selected Bonnie Berger as the 2020 AWM-SIAM Sonia Kovalevsky Lecturer. The SIAM Annual Meeting will not be held in Toronto, as originally planned, due to COVID-19, but select sessions will be held virtually over a longer time frame, July 6–17. Details are not yet available at the time of this writing, so please check www.siam.org for further details.

Berger currently serves as the Simons Professor of Mathematics at MIT with a joint appointment in Electrical Engineering and Computer Science, heading the Computation and Biology Group at MIT's Computer Science and AI Laboratory. Berger began her career at MIT as a graduate student, obtaining her PhD and then completing a postdoc. She has also received an honorary doctorate from

École polytechnique fédérale de Lausanne (EPFL) in Switzerland.

Berger works with the biological community, focusing on the massive amount of data being gathered by research in the biomedical field, making significant contributions to computational biology and furthering our understanding of proteins and the genome. Making advancements in research with both theoretical and algorithmic contributions, her influence on cross-disciplinary work has received both national and international recognition. Her continued contribution to the systems biology and genomics fields has allowed researchers across disciplines to use advanced software developed through her lab.

Berger will speak on using algorithms to compress the large pools of biological data into a reduced representation. Leveraging the true low-dimensional structure of biological data manifolds, her research groups are able to create comprehensive and usable compact geometric summaries of

this data. Highlighted in the lecture will be the group's latest work, on single-cell transcriptomic datasets. These datasets will enable an unprecedented scale of data to be effectively pooled from individuals and institutions across nations to enable novel, life-saving discoveries.

While Berger continues to make an impact on the mathematical community, she also makes sure to influence the rising generation through mentorship and service to developing young investigators. Following in their mentor's footsteps, many of her students have earned prestigious awards and recognition for their research and accomplishments.

A leader in bioinformatics and computational biology, Berger is widely recognized for her multifaceted intellectual interests. She has over 200 publications to her name. Early awards include the NSF CAREER Award and the Biophysical

Society's Dayhoff Award for a woman in biophysical research. In 2012 she became an elected member of the American Association for the Advancement of Science (AAAS), and in 2019 received an Accomplishment by a Senior Scientist Award from the International Society for Computational Biology (ISCB). This year she was elected to the National Academy of Sciences.

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

CALL FOR NOMINATIONS

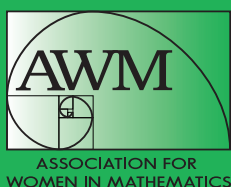
The 2021 Kovalevsky Lecture

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

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

The lectureship may be awarded to anyone in the scientific or engineering community whose work highlights the achievements of women in applied or computational mathematics. Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be an additional letter of support. Nominations for members of underrepresented minorities are especially encouraged. The nomination must be accompanied by a written justification and a citation of about 100 words that may be read when introducing the speaker. Nominations are to be submitted as ONE PDF file via MathPrograms.Org. The submission link will be available 45 days prior to the deadline. Nominations must be received by **October 1, 2020** and will be kept active for two years.

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



See awm-math.org for the latest news!

STUDENT CHAPTER CORNER

Coordinator: Emek Kose, student-chapters@awm-math.org

Women in Math Panel on International Women's Day

Alexandra McSween (MSc in mathematics student at the University of Ottawa)

The Ottawa AWM Student Chapter hosted its second annual International Women's Day Women in Math Panel on March 6th. We welcomed over 80 participants to hear four women mathematicians share their experiences. The panelists were Megan Dewar, the Director of the Tutte Institute for Mathematics and Computing; Maryam Haghghi, Satellite Communications Analytics Manager; Sara Maloni, Assistant Professor at the University of Virginia; and Marie-Joe Nemnom, Methodologist at the Ottawa Hospital Research Institute. The event was entirely student organized, with financial support from the Fields Institute and the Ottawa math department.

These women came from different areas of mathematics ranging from game theory to optimization to geometry to statistics, so they were able to provide unique perspectives. One of our questions to the panelists was "how do you handle failure?" This is a question particularly relevant to students since we are so often taking tests and being graded on them. We often like to think of mathematics as objective and beyond human influence, but our panelists reminded us that grades and feedback are subjective and influenced greatly by the people giving them. They also reminded us to not take a bad grade as a reflection of yourself but instead to see it as being temporary and as a lesson.



During the Women in Math Panel

We also asked our panelists "what is the biggest challenge facing women in the (mathematical) workforce today?" Our panelists pointed out the gender imbalance in the division of labor at home as well as in the workforce. Often women are expected to take on the additional workload of outreach in a (well meaning) bid to improve diversity in math. However, this is a huge burden placed on the shoulders of women mathematicians and we all need to be sharing the load equally!

That being said, we are honored that our panelists accepted our invitation and that we have heard their stories. It was also an honor to host our many attendees and hear their questions and learn what is important to them.

We also had the privilege of listening to a Distinguished Women in Math Lecture from Sara Maloni earlier in the day. Maloni presented a graduate student-accessible lecture on the life and work of Maryam Mirzakhani. This was an excellent way to pair a career panel with an academic lecture and to connect student leadership with professors in the department. We hope the Distinguished Women in Math Lecture becomes an annual tradition, as well.



Panelists and AWM Student Chapter Members

Young Mathematicians & COVID-19:

Kristin DeVleming has published a useful document on this topic at math.ucsd.edu/~kdevleming/advice.pdf. Her 5th point is good for all of us: Know that, in the midst of a GLOBAL PANDEMIC ... it is OKAY to get less work done than you would otherwise.

BOOK REVIEW

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

“Keep the Damned Women Out”: The Struggle for Co-education, by Nancy Weiss Malkiel, Princeton University Press, 2016. ISBN 978-0-691-17299-6

Reviewer: Marge Bayer

It has now been about 50 years since most of the all-male colleges and universities in the United States (and a few all-female colleges) went coed. This book is a deeply researched study of colleges that went through that transition, and some that chose not to, with a focus on Harvard/Radcliffe, Yale, Princeton, Vassar, Smith, Wellesley, Dartmouth, and the Colleges of Cambridge and Oxford Universities. At 600 pages, it includes a lot of detail about the processes and committees that made the institutional decisions, but also describes what motivated colleges to reach those decisions.

I started college in 1973. By that time, Yale, Princeton, and Dartmouth were admitting women, and Vassar was admitting men. Many other selective men's schools had also started admitting women; examples include Williams,

Wesleyan, Notre Dame, Brown and CalTech. As far as I can recall, the new coeducation status of these colleges did not enter into my consideration of where to go to college. (I decided early on that I wanted to go to a large state university.) But it was a factor for some of my friends. Two of my close female friends went to Williams; one of those had an older brother who was in one of the first coed classes at Vassar.

In this review I will not go into the negotiations at Harvard and Radcliffe, which involved quite different issues from the others. All of these colleges went through long deliberations before making the final decision about coeducation. They were influenced by each other, and sometimes by the fear of lagging behind their competitors. Some considered pursuing a “cooperating” arrangement with another single-sex college, similar to that of Harvard and Radcliffe, or Columbia and Barnard. I was surprised to learn of talks between Yale and Vassar, and between Princeton and Sarah Lawrence, about the possibility of the women's college moving to become a neighboring “sister” college of the Ivy League school, and of talks about the possibility of a special (but geographically distant) relationship between Dartmouth and Wellesley.

The motivations and considerations for men's and women's colleges were quite different, of course, and this
continued on page 10

CALL FOR NOMINATIONS

Alice T. Schafer Mathematics Prize

The Executive Committee of the Association for Women in Mathematics calls for nominations for the Alice T. Schafer Mathematics Prize to be awarded to an undergraduate woman for excellence in mathematics. All members of the mathematical community are invited to submit nominations for the Prize. The nominee may be at any level in her undergraduate career, but must be an undergraduate as of October 1, 2020. She must either be a US citizen or have a school address in the US. The Prize will be awarded at the AWM Reception and Awards Presentation at the January 2021 Joint Mathematics Meetings in Washington, DC.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be at least one additional letter of support. Nominations for members of underrepresented minorities are especially encouraged. The letter of nomination should include, but is not limited to, an evaluation of the nominee on the following criteria: quality of performance in advanced mathematics courses and special programs, demonstration of real interest in mathematics, ability for independent work in mathematics, and performance in mathematical competitions at the local or national level, if any. With the letter of nomination, please include a copy of transcripts and indicate undergraduate level. Any additional supporting materials (e.g., reports from summer work using math, copies of talks, recommendation letters from professors, colleagues, etc.) should be enclosed with the nomination. All nomination material is to be submitted as ONE PDF file via [MathPrograms.Org](https://mathprograms.org) with a copy of transcripts included at the end of the file. The submission link will be available 45 days prior to the deadline. Nominations must be received by **October 1, 2020**. If you have questions, phone 401-455-4042, email awm@awm-math.org, or visit <https://awm-math.org/awards/schafer-prize-for-undergraduates/>.

accounts in part for the differences in single-sex colleges today. While there are at least 30 all-women's colleges in the US today, including four stand-alone women's colleges of the original Seven Sisters (Bryn Mawr, Mt. Holyoke, Smith and Wellesley), there are only three men's 4-year colleges (Hampden-Sydney, Morehouse and Wabash) in the US, not counting religious vocational institutions.

With hindsight, it is clear that the gender integration of the elite men's colleges was inevitable, that the list of pros was long and varied, and the list of cons included short-term issues and emotional reactions. The colleges had to figure out logistical issues ranging from housing and bathrooms to athletic teams. They had to decide if they could afford to increase enrollment substantially, or if they had to decrease the number of men admitted to make room for the women students. Over time the attitudes of alumni shifted; opposition from alumni softened, in part with the realization that daughters and granddaughters could attend the alma mater. The book mentions concerns about women's different curricular needs, but with little or no explanation. One hint was: "The dean of Radcliffe sent advice that Princeton's expectation of

four years of high school mathematics 'might be intimidating' to female applicants." [p. 184]

In the late 1960s and early 1970s the number of applicants at men's colleges was decreasing; surveys of high school students and counselors indicated the students' preference for coed schools. At the same time, some of the colleges were pursuing other forms of diversity; as a first step this meant recruiting more heavily from public schools, instead of relying on private schools (and some of those feeder schools had started admitting girls). Some recognized that opening up to women would increase the academic strength of the applicant pool. And, of course, some supported coeducation from the standpoint of equal opportunity.

There was a change in the faculty as well. Many new faculty were hired in the 1960s, and elite private schools started recruiting faculty not just from their own ranks, but from public universities, such as Berkeley, Illinois and Michigan. The faculty still included few women. The first female professor at Princeton was appointed in 1968; the following year two female assistant professors were hired. [p. 216] At Harvard, in 1974, there was one tenured female faculty member out of 400, "and she was appointed to a chair restricted to members of her sex." [p. 251] But in general the

CALL FOR NOMINATIONS

The 2022 Noether Lecture

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

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

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted, in which case there must be an additional letter of support. Nominations for members of underrepresented minorities are especially encouraged. The letter of nomination should include a one-page outline of the nominee's contribution to mathematics, giving four of her most important papers and other relevant information. Nominations are to be submitted as ONE PDF file via MathPrograms.Org. The submission link will be available 45 days prior to the deadline. Nominations must be submitted by **October 1, 2020** and will be held active for three years. If you have questions, phone 401-455-4042, email awm@awm-math.org or see the website <https://awm-math.org/awards/noether-lectures/>.

younger male faculty members found the all-male environment unnatural. In the general society women were taking on more prominent public roles, and some argued that an all-male college did not prepare the students to work with women in a professional capacity.

A large majority of the students at the male campuses favored going coed. The social life revolved around weekend visits to or from all-women's schools, making it difficult to have normal friendships with women. Also, some hoped that the presence of women students would tame the excesses of male culture sometimes found on the campuses. John Kemeny, President of Dartmouth (and mathematician), was quoted as saying that by keeping the college all male, "there was a strong danger that we'd be turning out a generation of male chauvinist pigs who would not be able to work with women as equals in the professions." [p. 450]

For the women's colleges, the calculus was different. Especially as the elite men's schools started admitting women, there were justifiable fears that the number or quality of applicants to the women's colleges would decrease. This was a convincing argument for Vassar, which was the only one of the stand-alone colleges of the Seven Sisters that decided to go coed. It was ultimately successful in becoming a truly coed college with a strong academic reputation, but in the early years it was difficult to recruit male students.

For Smith and Wellesley (and presumably for others not detailed in the book), the value of single-sex education for women was considered paramount. A main argument for all-female education is that girls and women are more free to voice their opinions and more assertive than they would be in the coed environment. In the process, they would develop more self-confidence and more professional skills. The commitment to all-women's education was influenced by the feminist movement. In 1971 the Smith College commencement speaker was Gloria Steinem. (It was rare at that time for Smith to have a female commencement speaker, and the selection of someone seen as a radical feminist was complicated.) Gloria Steinem weighed in against Smith going coed. "Our heads are not together enough yet as women to be integrated." [p. 387] Opponents of coeducation at Smith and Wellesley argued (justifiably) that women students, faculty and administrators ended up with lesser status at coed institutions.

I have stressed the factors that went into coeducation decisions, but not the individuals. Of course, the attitudes of college presidents, and leaders of trustees and alumni, had a big impact, perhaps less on the final decision than on the time it took to get there. Sometimes student leaders were also influential. Hillary Rodham was president of the Wellesley student government in 1968–69 and worked with Philip

Phibbs, executive vice president of the college, on the issue of coeducation. [pp. 394–395]

What was the experience of the first women students at Yale, Princeton, and Dartmouth? At first the women were such a small minority of students. In the first year Princeton accepted first year women, there were a total of 170 undergraduate women (including first years, transfers and visiting students) with 3251 undergraduate men. In some cases, women complained of frequently being asked for the "women's perspective" in class. "In a math class [at Yale], a woman student was asked for her opinion on the chain rule," so as "to include the female point of view." [p. 149] The book gives disturbing detail on harassment of female students at Dartmouth in the early years of coeducation, and the complicity of the college's dean Carroll Brewster, who soon left to become (ironically) president of the all-female Hollins College.

The last part of the book is about Cambridge and Oxford. I will say little about this, partly because I do not really understand the college system at those universities. Other universities in the United Kingdom were coed when Oxford and Cambridge began consideration of the issue. The universities already had women's colleges, some dating back hundreds of years. But it is not clear to what extent these colleges were integrated into the academic and social life of the university. Most of the men's colleges went through the transition to coed in the 1970s. By 1988 all of the formerly men's colleges at Oxford and Cambridge admitted women. At Oxford, all the formerly women's colleges are now coed (with the last making the transition in 2008), but Cambridge still has two women's colleges. In arguing against coeducation at the men's colleges, opponents said that it was going against the intentions of the founders. A counterargument was that precedent for such a dramatic change was the 19th century decision to eliminate the requirement that fellowships were "conditional upon either the taking of Holy Orders or on celibacy." [p. 538]

Although MIT had women students starting in 1871, the number was tiny, even up through the 1950s. An interesting history of women students at MIT was compiled by Robert M. Gray and is available at https://ee.stanford.edu/~gray/Coeducation_MIT.pdf.

A large amount of research went into this book. The author consulted 68 manuscript collections, read or listened to 42 oral histories and conducted 43 interviews. Perhaps you do not want to read all the detail on all the universities, but for anyone who studied or taught at one of these colleges, those details will be fascinating.

Added in Press: 2021 Noether Lecture Cancelled

AWM email, June 11, 2020

The Association for Women in Mathematics, the American Mathematical Society, and Andrea Bertozzi announce the cancellation of her Noether Lecture at the 2021 JMM. This decision comes as many of this nation rise up in protest over racial discrimination and brutality by police.

We at AWM apologize for our insensitivity in the timing of the announcement last week of the lecturer and the pain it caused. We recognize that we have ongoing work to do in order to be an organization that fights for social justice, and we are committed to doing what is necessary.

The AWM reaffirms our commitment to stand by the Black community against police brutality and racism (<https://awm-math.org/nam-amplification/>; see the text of this document to the right).

NAM Amplification

AWM and the Society of Industrial and Applied Mathematics stand in solidarity with those protesting systemic racism in the United States, racism that includes police brutality and killing that disproportionately affects Black Americans. Black mathematicians and students of mathematics face racial injustice every day. In this national moment of awareness and societal commitments to principles of justice, equity, diversity, and inclusion, we acknowledge our debt to the National Association of Mathematicians (NAM) for their leadership in those areas. We encourage our members to support, amplify, and uplift NAM and its 51 years of work in support of a world in which our Black colleagues and students are able to participate freely and fully in mathematics without the direct and indirect psychic tolls of being Black in mathematics and Black in the United States of America. <https://www.nam-math.org/>. See the full AWM statement at <https://awm-math.org/policy-advocacy/endorsements>.

EDUCATION COLUMN

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

Two Items: Report on STEMM Barriers and Possible COVID-19 Effect on Journal Submissions

Jackie Dewar, Professor Emerita of Mathematics, Loyola Marymount University, jdewar@lmu.edu

Two items have caught my attention: A National Academies Press (NAP) report on the underrepresentation of women and some early data on gender differences in journal submission in the times of COVID-19.

Recently, NAP published a consensus study report titled *Promising Practices for Addressing the Underrepresentation of Women in Science, Engineering, and Medicine: Opening Doors* (National Academies of Sciences, Engineering, and Medicine, 2020). Although “mathematics” does not appear in the title, the report examines the situation for

women in all STEMM (science, engineering, technology, mathematics, and medicine) fields. The report is available as a pdf for no charge at <https://doi.org/10.17226/25585>.

According to the description on the NAP website, this report “reviews and synthesizes existing research on policies, practices, programs, and other interventions for improving the recruitment, retention, and sustained advancement into leadership roles of women in these disciplines.” It also “makes actionable recommendations to leverage change and drive swift, coordinated improvements to the systems of education, research, and employment in order to improve both the representation and leadership of women.” The report includes: (1) an introduction to the problem of gender inequity; (2) factors driving the underrepresentation of women in STEMM; (3) educational interventions to improve recruitment and retention of girls and women into STEMM; (4) effective practices to address gender disparities; (5) how to overcome implementation barriers; and (6) recommendations.

I was impressed that the final chapter didn’t just make high-level recommendations, it also included “a series of implementation actions for each recommendation that are designed to provide stakeholders with specific, practical advice” (p. 148). Throughout the report I found an emphasis on “intersectionality”; the concept appears multiple times

in each of the six chapters. *Intersectionality* can be defined as “the processes through which multiple social identities converge and ultimately shape individual and group experiences (McCall, 2005; Museus and Griffin, 2011)” (p. 48). Again and again, the report highlights the importance of considering the intersectional experiences of women of multiple marginalized identities (e.g., race, class, sexual orientation, disability status).

The second item concerns gendered patterns in recent journal submissions. On April 21, 2020, *Inside Higher Ed* (IHE) reported that some academic journals are seeing changes in submission patterns that might indicate COVID-19 is negatively affecting women’s research productivity (Flaherty, 2020). The IHE article observed that the increased caregiving responsibilities resulting from the coronavirus pandemic may have exacerbated work-life balance inequities that already existed.

Of the three journals mentioned in the article, one was in the field of philosophy of science, and the other two were in political science. I thought readers might want to hear about this emerging pattern. To me, it seems a little early to be tracking and drawing conclusions from data like this. Still, I would be interested to know what mathematics journals are seeing in terms of submissions during the pandemic.

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Editor’s Note: Anna Bargagliotti, who usually writes the Education column for the July–August issue, will instead contribute to the November–December issue this year.

A Diverse and Collaborative Conference on Data Science

Laramie Paxton, Marian University–Wisconsin

The Data Science and Image Analysis Conference of the Pacific Northwest (DSIAC) took place in cooperation with AWM the last weekend of February 2020 at Washington State University in Pullman, Washington. The organizers were Viktoria Taroudaki (Eastern Washington), Justin Marks (Biola), Charles Moore (Washington State), and Laramie Paxton (Marian). As a highly student-centered conference, DSIAC’s aim was threefold: 1) Increase diversity in data science and image analysis by funding women and members of underrepresented groups to attend and present. 2) Create a highly inclusive and collaborative environment in which participants attend short talks on open problems followed by full group discussions. 3) Provide professional development opportunities for students and early career researchers through presenting, group discussions, panels, and workshops.

In support of these goals, the organizers received a conference grant from the National Science Foundation of \$20,000 to fund students and early career researchers to attend from across the nation, with a special focus on providing funding for women and members of underrepresented groups to attend and share their research. Recruitment efforts were focused in two areas, the first of which was to promote the event through organizations dedicated to diversity in mathematics: AWM, Math Alliance, and the Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS). The second focused on contacting university departments in the region, including mathematics, computer science, and electrical engineering. Applicants were asked to submit a statement of interest in which they described how they would benefit from attending, and women and members of underrepresented groups were strongly encouraged to apply. This effort was highly successful in that the conference funded 40 students to attend from as far away as Rhode Island, with just over half being women and 2/3 being from underrepresented groups.

The first day of the event was focused on open problems from experts in the field and started with an inspiring keynote talk from Emmanuel Yera, one of the founding data scientists at Primer AI in San Francisco, entitled “A Career Path to Data Science and Generating Image Captions for News Articles.” Yera began by sharing his experiences as a young Latino student entering the field of data science

continued on page 14

CONFERENCE ON DATA SCIENCES *from page 13*

and described several pathways for those interested in becoming data scientists. He also described a current problem he is working on related to image captioning and led a brainstorming session with the audience on how to solve it. His talk was highly motivating for students and served to set the tone for the conference.

For the remainder of the first day, attendees were able to choose between two parallel sessions of talks from a diverse group of experts on open problems. Each session consisted of three 10-minute talks in a row, followed by 45 minutes of discussion with the whole audience. Some of the talks mentioned as being the most impactful and useful for attendees were a pair of talks from researchers at Pacific Northwest National Laboratory (PNNL) on the topic of hypergraphs by Emilie Purvine, “Generating Synthetic Data Via Random Tensors,” and Cliff Joslyn, “Mathematical Adventures in Multidimensional Data: From Incidence Tensors to Lattice-Valued Schema Hypergraphs.” Other talks mentioned include “Human-in-the-Loop Selection of Optimal Time Series Anomaly Detection Methods,” a talk by Cynthia Freeman of Verint Intelligent Self-Service discussing anomalies in data, detection methods, and fine-tuning parameters. In addition to more technical talks, there

were several of a more general or even ethical nature, for example “Where’s My Scikit-Clean? Addressing the Data Prep Problem” by Matthew Sottile of Noddle.io. In this talk, Sottile addressed the vast amount of time and effort spent by data scientists on data cleanup, wrangling, and munging. He described how given the large proportion of their work devoted to this, data scientists, surprisingly, still do not have a “scikit-clean” to go with other important tools like scikit-learn and pandas.

The interaction that took place during the total of five group discussions was productive and lively. Audience members engaged at length with the speakers and each other, and this inclusive and collaborative format appeared to lead to many promising ideas for the open problems that were presented. One could observe many conversations continuing during the breaks and the reception that followed. The other important aspect of this first day of the conference was that students and early career researchers were able to freely participate in the process of discovery and collaboration, which can be difficult to find in traditional classroom and conference settings, especially for those who feel intimidated and whose voice is often not heard. Attendees expressed their appreciation for the format of the talks and the variety of topics presented. They especially noted the smaller size of the conference and the many networking opportunities

CALL FOR NOMINATIONS

The Association for Women in Mathematics Dissertation Prize

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

To be eligible for the award a graduate student must have defended her dissertation within the last two years (October 1, 2018 to September 30, 2020). She must either be a US citizen or have a school address in the US. The Prizes will be presented at the AWM Reception and Awards Presentation at the Joint Mathematics Meetings in Washington, DC.

Anyone can be a nominator, whether or not they are AWM members. Self-nominations are permitted. Nominations for members of underrepresented minorities are especially encouraged. The nomination should include: 1) a one to three page letter of nomination highlighting the exceptional mathematical research presented in the dissertation, 2) a curriculum vitae of the candidate not to exceed three pages, 3) a copy of the dissertation and 4) two letters supporting the nomination. Nomination materials should be submitted online at [MathPrograms.org](https://www.mathprograms.org). The submission link will be available 45 days prior to the nomination deadline. Nominations must be received by **October 1, 2020**. If you have questions, phone 401-455-4042, email awm@awm-math.org, or visit awm-math.org/awards/awm-dissertation-prize/ for more information.

they had throughout the two days with both students and professionals.

The second day of DSIAC was entirely focused on professional development opportunities for students and early career researchers. The day began with two workshops held in parallel for students to choose between: “What is Data Science?” facilitated by Valentina Staneva (University of Washington) and “Intro to Research in Data Science and Image Analysis” by Sottile. These workshops aimed to give both undergraduate and beginning graduate students a basic overview of the tools and techniques used in data science and a glimpse into how to approach research in these fields. Participants mentioned that the workshops were accessible and helpful overall and seemed to gain some confidence in how to approach research, which can be very intimidating at first, especially for students who may not have had role models in these areas.

The next event of the day was also aimed at helping students build confidence, this time in the areas of internships and career preparation. Back-to-back panels, “Internships in Data Science and Image Analysis” and “Career Skills and Job Search Tips,” were held with Purvine, Freeman, Yera, and Leonard Apeltsin (UC Berkeley) as panelists and with Taroudaki as moderator. Attendees were able to learn about the importance and availability of internships in data science and image analysis and some of the skills needed to both locate and secure an internship. Purvine is highly involved in recruiting interns at PNNL and was able to give specific tips about opportunities there and at other national labs. The career panel was focused on recommending best practices in preparing job search materials, highlighting some of the common mistakes that students make when beginning their search, and connecting students with additional resources.

The last event of the conference was the student and early career researcher presentations, which featured over 40 presenters, again with just over half being women and nearly 2/3 being from underrepresented groups. There were five parallel sessions featuring seven or eight talks of 15 minutes each with time for questions in between. Students seemed at times nervous, but also inspired to share their work with their peers and with experts. Another important feature of these sessions was that experts in the audience were provided with paper surveys to complete during the talks that were then given to the presenters as a way to provide discrete, written feedback from professionals. Also of note is that a group of eight female student speakers was selected to chair the student sessions, with several expressing their appreciation for this opportunity, as they had never done anything like that

before. This is another way in which DSIAC served to build confidence for women and members of underrepresented groups to encourage them on their pathways into data science and image analysis.

The conference concluded with an informal brown bag lunch provided so that attendees could continue networking and discussing the many ideas shared during the talks. Overall, the attendees expressed great enthusiasm about their experience at the conference, and many stated they would attend again if it were to be held next year. The success of DSIAC is encouraging in that future conferences across STEM could be modeled in a similar way with a focus on simultaneously increasing diversity in STEM, creating inclusive and collaborative spaces, and being highly student-centered with ample professional development opportunities. In closing, the organizers would like to give a special thank you for the support and generosity of AWM in promoting DSIAC, as some of the travel award recipients indicated that they learned about the conference thanks to AWM’s efforts.



Save the Date!

We hope you have all received your Save the Date postcard! We remind you here that the 2021 AWM Research Symposium will be held June 24–27, hosted by The Institute for Math and its Applications (IMA), in partnership with the University of Minnesota.



Interview of Deanna Haunsperger

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

Deanna Haunsperger is a Professor of Mathematics at Carleton College. Haunsperger co-directed the Carleton College Summer Mathematics Program for Women from 1995 to 2014, and recently served as the president of the MAA. Haunsperger is a member of the inaugural class of AWM Fellows and has also received the M. Gweneth Humphreys Award and the AWM Presidential Award.

M+M: Let's start by hearing a bit about your work in math.

DH: I earned my PhD at Northwestern in 1991 under Don Saari in Voting Theory. More recently, however, for my scholarly work I have been directing small-group projects with Carleton seniors. I like letting them have some choice in their topics, so recently I organized a group in the Mathematics of Origami, and I am currently leading a group that is going into our local middle school and starting a Math Circle for 6th grade students. I especially like the group projects where my students can get out and work in the community, usually in the form of helping create a particular math curriculum, like the Math Circle, or online GED math study materials for recent immigrants to our community, or Challenge Math materials to be used by parent volunteers in the local elementary schools.

M+M: And tell us about your career stage.

DH: I have taught at Carleton College for 26 years, after a three-year visiting position at St. Olaf College. While I was at St. Olaf, as a fresh PhD, I absolutely loved teaching, and I liked doing research, but I was still reflecting on why graduate school had been, at least in the first two years, so miserable for me. I had been a first-generation college student and although I loved my undergraduate institution, I hadn't chosen one that would prepare me to go to graduate school. More importantly, I didn't even know that I wasn't prepared for graduate school; I just thought everyone else picked up on things more quickly than I did. So for the first two years of graduate school, I had to teach myself the parts of my undergraduate education that I was missing at the same time I was taking graduate level classes, and it didn't go very well. I knew there were other first-generation students and others who wouldn't be well-prepared either, possibly



Deanna Haunsperger and her family

thinking they weren't as bright as their colleagues, and I wanted to save them the frustration of my first two years, while still encouraging them to pursue mathematics. During my time at St. Olaf, I thought a lot about what I could do to make the transition to graduate school more possible and friendlier for those who follow me. I wanted to fling open the doors to advanced mathematics for my students but also for a much broader collection of students than I could ever reach in the classroom. That's when my husband and fellow-mathematician Stephen Kennedy and I heard about the summer women's program at Mills College. We had a student come back from there to begin her senior year at St. Olaf. She told us that she really learned so much, but that it was already her senior year, so she couldn't make many changes in how she studied or what she took. In some sense, the information she got arrived too late. That's when we decided to start the Carleton Summer Mathematics Program for Women (SMP) (then the Carleton–St. Olaf Program, as we were making the transition to Carleton) to reach undergraduate women in the first or second year of their undergraduate education and to give them all this encouragement, mentoring, and advice.

That passion has directed much of my professional life (and much of my husband's as well). We started the Carleton SMP in 1995, which we ran nearly every summer through 2014 (when the NSF stopped funding most programs for women). Then 1999–2004, we edited *Math Horizons*, the MAA publication for students designed to show them the people, problems, history, and culture of mathematics and welcome them into the mathematical community. After

editing *MH*, I became much more involved in the MAA because I really felt at home there, with other people who had the same passions I did to build our community and welcome all into it. I've spent the past fifteen years continuing to run the summer program and the communities that have grown out of that with Stephen, serving the MAA in a variety of different ways, editing the latest edition of *101 Careers in Mathematics* to show students the importance of mathematics for careers, and teaching at Carleton. Most recently I finished being President of the MAA, and now I'm looking for what's next in my life.

M+M: I remember looking at posters advertising the Carleton SMP program when I was an undergrad. At that time I was just starting to become aware of the fact that my experience in math was going to be different from a typical male experience, in ways I couldn't really control. I'd stand in the hallway looking at the poster, noticing that it felt good to see pictures of happy young women talking about math. So even though I didn't attend the program, it affected me!

My next question is about how your family developed in parallel to these career milestones.

DH: I met my husband in graduate school. He was in his fifth year at Northwestern when I was starting. He knew pretty early on that he would be moving with his advisor for his sixth year at UT Austin, but we decided to do the long-distance thing. After graduating, he had a couple of visiting positions while he was waiting for me to finish; after my fourth year I joined him at the University of Delaware where he had a postdoc, and they were very good to me and let me teach while I finished writing my dissertation.

The next year we moved together to three-year visiting positions at St. Olaf College. It was at St. Olaf that we decided to apply for funding for the Summer Math Program for Women, and we also decided to try to start a family. As a paraplegic, I didn't know how a pregnancy would be for me, and we thought trying it younger was better than waiting. We got pregnant right away, and had an uneventful pregnancy, so when we were on the job market again in 1994, we had a six-month-old son Sam breastfeeding during the job search. Some institutions (like St. Lawrence University) were very cool about interviewing the two of us and helping us find a way to bring our infant with us for the interview. Another school tried to interview us at the JMM that year in the lobby of the conference hotel in the evening. At our son's bedtime. Our friend who was watching Sam across the lobby, turned in such a way that Sam saw me, and he started howling for his mom. I waved him over and started breastfeeding Sam, and the interviewer was outrageously uncomfortable. He didn't know where to look or

what to do. Needless to say, we never heard a peep out of that school again!

We were able to split a job at Carleton, which was our ideal while we raised our son. We really loved our jobs, and we threw ourselves into them, working much more than half time. The only thing that was really half was our pay. A few years later, our daughter Maggie was born, and near the same time we applied to go full-time. A year or so later we both became full time, with kids ages 4 and 1 at home.

Since my husband was my colleague, some might think that I'd try to keep my kids as separate from my career as possible. On the contrary, I loved having the various parts of my life layer together nicely as a whole. This worked especially well in the summers, when Stephen and I would immerse ourselves in our summer program spending time with the women, but we didn't want our kids to miss out on kid-friendly summers. So our kids just came with us and helped us run the summer programs every summer. We would have staff meetings once or twice a week at our house that would involve Stephen cooking, the instructors and teaching assistants for the program gabbing, me making a huge amount of peach cobbler, and our kids just tucked right into the middle of it all. (To this day, my kids, now 26 and 23, still have many friends who were parts of the summer programs over the years. And they have this amazing perspective—they know significantly many more female mathematicians than they know male mathematicians. To them, that's the correct world order.)

While we were at St. Olaf, the MAA began the student magazine *Math Horizons*. Stephen and I really fell in love with the idea of it—a journal for students to read and feel like they're a part of our bigger mathematical community! We wrote several articles for it over the next couple of years, and when the Editor Don Albers decided to step down, he asked us to consider applying to replace him. We never thought we would be able to edit a math magazine, and we had young kids, but it fit so naturally with the things we cared about, that we applied anyway. In 1999, when our kids were six and three, we took over as Editors of *Math Horizons*. We were married in 1990 and had kids in 1993 and 1996, so taking on *MH* in 1999 felt like it was our third child.

As my kids became teenagers, they continued to hang out with the summer program, my daughter especially, but they would bring friends with them to SMP events, which I thought was a good environment for young women. To my great delight, our house became a hang-out house for my kids' friends. I would never have wanted to miss that; I feel so fortunate to be allowed to play a little role in the lives

continued on page 18

of their friends. I spent many evenings doing my work at the dining room table so that I could be in the middle of all the hubbub of daily life.

When I had one kid in college and one headed for a gap year in Ecuador, the NSF, to my amazement, decided to defund many women's programs in math. Suddenly I had school years with no kids at home and summers without the SMP. I felt that I had more time to take on more responsibility in the MAA, and, fortunately for me, opportunities arose to serve as Council Chair for Outreach, and then later to serve as President.

Now I'm trying to figure out what's next!

M+M: When I hear your story, the word "giving" keeps coming to my mind. As you describe your path, you are "giving" a lot to various communities. How do you figure out what the right setting is on your personal thermostat for "giving" vs. "needing for yourself," and does this change over time?

DH: I'm not good at being idle. I'm happiest when I'm doing something, and I get my energy from working with others. I feel very fortunate because I've been able to make or find so many opportunities to do these things I enjoy. I do make sure to carve out family time, especially when my kids were young. I rearranged my schedule so that I could pick my kids up after school, and be with them when all that good school debriefing happened and during homework time and through dinner, then I would pull my work back out and finish what I needed.

M+M: That is really impressive. I am interested in how people decide on a level of visibility regarding the existence

of their family or children. People seem to have different levels of confidence about allowing their family life to be seen by the math community. (I notice this even between my husband and myself, which is surely influenced by gender.) Of course people may just have different preferences, but what concerns me is when someone's choices about this are affected by social fears, rather than their own personal preferences. Do you have advice to people about sorting this out: figuring out what level of visibility they truly would enjoy or value, and then getting to that point?

DH: I understand that there are some jobs where it's difficult to have children, and I think we should all work to put pressure on establishments to change that culture. Stephen and I decided (perhaps in that moment when I ended up breastfeeding on an interview) that wherever we worked, they were going to have to understand that some people have kids, and we were two of those people. I completely understood people making other choices so that they could get the job of their dreams, but the job of my dreams would only be the job of my dreams if it was able to make space for me to be a parent. When we applied for jobs after our visiting positions at St. Olaf, back in the days of paper applications, we had separate application packets, each acknowledging that our son had just been born, and we literally stapled them together and sent them off.

M+M: That's a helpful idea, to make sure to frame the idea of a "dream job" very carefully, to make sure it fits with other basic aspects of your "dream life." I also liked hearing about your house being the hangout place for your kids' friends. I remember reading an article where someone commented that having great food was a way to make this

CALL FOR PROPOSALS

Research Collaboration Conferences for Women

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

Mathematicians interested in organizing the first conference of a new RCCW are invited to submit a proposal to the AWM describing the conference topic, potential co-organizers and project leaders, and potential participants. Proposals should be no more than one page (PDF files only, please), and should be sent to awm.rccw@gmail.com. Deadline for submission: **July 1, 2020**.

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

happen, so she felt like she spent the years when her kids were teenagers by roasting chicken all the time! Do you have ideas about how this center of gravity developed around your house?

DH: I remember when my daughter was in upper elementary and wanted to be with friends all the time. I made a conscious decision at that time to say yes to having friends over because I wanted to encourage our house being the hangout house. My husband does most of our cooking, and he grew up in a family of eight kids, so he doesn't know how to make meals for just four anyway. I'm the family baker, and I always kept ingredients for oatmeal chocolate chip cookies and seven-layer bars in our cupboards. Young people always knew they were welcome in our home; even on short notice, like when the cast of the spring musical revue wanted a venue for the cast party (for 120 kids) on one day's notice, they knew we'd say yes. But it was well worth it—the extra folks at dinner, the additional homework help, the occasional added drama—all of it. I still have a very close relationship with a bunch of my kids' childhood friends; I am very lucky they are in my life.

M+M: This sounds very special, and what a great bonus, to have these long-lasting effects as well. It's a good tip for all of us with early-stage families. Speaking of which, when I first had a baby and was pushing a stroller around, I suddenly became very aware of accessibility. Then when I took a job in a math department where the chalkboards were immobile and fixed high on the wall, I realized there was a significant amount of board space I simply couldn't reach, and this made teaching just a bit harder. Of course these were small impacts on me, but it started a larger frustration with myself: it took something directly affecting me for me to wake up to accessibility issues that are unavoidably important for paraplegics. Could you recommend resources for departments to understand quickly what we need to do to make math events more accessible?

DH: That's a really good question. I don't have specific resources to recommend because many if not most accommodations need to be specific to the person needing them. There are as many different accommodations needed as there are people with disabilities. Not even all paraplegics need the same thing—far from it. If there is a particular guest coming to campus who may need something special, you would need to talk to that person directly and ask what accommodations they need. The person with the disability is the expert and usually can suggest something workable. (Student accommodations are often handled through an office for disability services on campus which specializes in student-specific needs.)

M+M: Thank you for that advice. We should all remember: “just ask the experts!” But it also reminds me

of a time someone did exactly that, and I didn't react very well. During my third pregnancy, I was facing a collision of a few wonderful opportunities that ironically looked like they might make me lose my chance for a semester without teaching (i.e. maternity leave). Someone at the university asked me “What would you do with maternity leave?” I was momentarily speechless. I heard it as “Why do women need maternity leave anyway?” I was also horrified, as I turned over in my head how I could possibly say, in a professional situation, how physically traumatic that time period can be for mothers. But it turned out he meant it as “Could you remind me, a man with no children, of all the great reasons you need this, so I have them fresh in my head when I go to the administration and try to get this for you?” I'm still thinking over this interaction.

This brings me to my last question. For the past year or so, I keep coming back to the idea that “it takes diversity to get diversity.” I'm not sure how that phrase first popped into my head, but for me it is a shorthand for all the ways it is difficult for a relatively homogeneous community to make meaningful change at a time when few (if any) of its members have first-hand knowledge of personal characteristics x , y , z . First, to understand that it needs to change; second, to understand the ways it needs to change; third, to convince other people invested in personal characteristics x , y , z that it is genuinely changing and it is going to be a comfortable community to join even if it might not obviously appear that way yet, and so on. I do think one of the ways to try to leap out of stasis is to “just ask the experts!”—but as I learned, sometimes receiving those questions is awkward too, and can even reinforce a sense of distance. What do you think about the idea that “it takes diversity to get diversity,” or about possible ways to make truly striking changes in a community?

DH: I hear what you're saying, and I do believe that having diversity is an existence proof that a community is interested in being more diverse and welcoming. But there is diversity on many different axes; most communities won't have representation of all kinds of difference. I like to believe that anyone can make a difference in making their part of the world a more friendly, fair, welcoming, equitable place. We first have to start with awareness of and openness to others and their lives and their needs. Diversity in your community does increase awareness and understanding, so it does help in making a more welcoming environment, but really that's just a better, healthier environment for everybody. Many people mean well in trying to promote diversity, but there's a lot of ignorance out there; we just need to continue educating ourselves and others. I don't know anyone who is

continued on page 20

offended by someone who is genuinely trying to make their part of the world more welcoming. But change happens slowly, almost imperceptibly, and we need to be in it for the long haul. It's sort of like the tectonic plates rubbing against each other, moving so slowly that it's like they're not moving at all. Every once in a while, though, there's a release of all that built-up imperceptible change, and the status quo

gets shaken up. I've seen huge progress in gay rights during my lifetime. The Americans with Disabilities Act made an indescribable leap forward in the quality of life that I have been able to live. I plan to keep doing my part in nudging things along, waiting for the next earthquake.

Thank you to Deanna Haunsperger for this inspiring interview with Mathematics+Motherhood.

Karin Melnick Receives Birman Fellowship

AMS, April 2020

Karin Melnick of the University of Maryland, College Park, has been awarded the AMS Joan and Joseph Birman Fellowship for Women Scholars for the 2020–2021 academic year.

Melnick's research is on differential-geometric aspects of rigidity. This work comprises global and local results relating the automorphisms of a differential-geometric structure with the geometric and topological properties of the space. Melnick also works in smooth dynamics, in which an invariant differential-geometric structure plays an important role in the proof of rigidity theorems. Melnick is a leader in research on the Lorentzian Lichnerowicz conjecture, a statement about conformal transformations of compact Lorentzian manifolds. Together with collaborators, she has developed new techniques in the setting of Cartan connections that have facilitated progress on this problem, as well as many results for other differential-geometric structures and general parabolic Cartan geometries.

Brief Biography of Karin Melnick: Melnick received her PhD at the University of Chicago in 2006 under the direction of Benson Farb. With an NSF Postdoctoral Research Fellowship, she went to Yale University as a Gibbs Assistant Professor. She received a Junior Research Fellowship from the Erwin Schrödinger Institute in the spring of 2009 and that fall began at the University of Maryland, where she is now an associate professor. Previously, Melnick has been awarded an AMS Centennial Fellowship and an NSF CAREER grant. She divides her time between the US and Germany with her partner and their young child and is very grateful for the flexibility provided by the Birman Fellowship and the opportunities it provides to advance her research and career goals.

About the Fellowship: Established in 2017, the AMS Joan and Joseph Birman Fellowship for Women Scholars seeks to give exceptionally talented women extra research support during their mid-career years. The primary selection criterion for the Birman Fellowship, which carries a stipend of \$50,000, is the excellence of the candidate's research.

Ruth I. Michler Prize

The Association for Women in Mathematics invites applications for the Ruth I. Michler Memorial Prize.

A \$47,000 prize will be awarded to a woman, recently promoted to associate professor or the equivalent, for a semester of mathematical research without teaching obligations in the Mathematics Department of Cornell University.

A supplemental housing/subsistence stipend award of \$3,000 will be provided. Office space, library access, and computing facilities will be provided by Cornell.

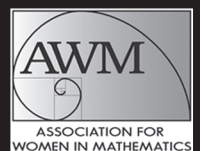
The application deadline is October 1 for the award to be used during the 2021–2022 academic year.



www.awm-math.org/michlerprize.html



Cornell University



AMS Mathematics Programs That Make a Difference Award

AMS, April 2020

The AMS, through its Committee on the Profession, is pleased to recognize the **Graduate Research Opportunities for Women (GROW) Program** with the 2020 Mathematics Programs That Make a Difference award.

GROW is an annual series of conferences that nurture, mentor, and expose undergraduate women to the opportunities that await a career in mathematics. Funded by the National Science Foundation and participating universities, the GROW Program is in its fifth year and has served hundreds of participants. Over this short span, GROW has built a community which, as much as the conference programming itself, has helped to make the mathematics profession a more appealing place for women to live and work. Through feedback, GROW steadily improves and creates best practices for future iterations as well as for replication.

Activities at GROW include research talks where scholars discuss not only their results but also their varied routes through academics, giving a personal touch and dispelling the straight-and-narrow myth around career paths. There are also panel discussions about graduate admissions. Conference-goers come with questions about preparation, the importance (or not) of GRE scores, how to approach letter writers, and so forth. Other meet-and-greet activities aim to connect participants to experts in a potential field of interest. The community-building aspect of the gathering is crucial for female students in a majority-male profession; the feeling that one is not alone can boost confidence.

GROW includes inspirational talks by iconic female speakers that make a big impression on the participants. As one conference attendee who is now in graduate school writes: "I gained confidence, personal and professional connections, and exposure to various careers in mathematics.... I met many women who assuaged my mounting fears about applying and succeeding in graduate school.... Sharing my fears and concerns about graduate school with other women who were either entering or attending graduate school was one of the most helpful aspects of GROW."

The AMS commends the GROW Program for its success in bringing more persons from underrepresented backgrounds into the mathematical profession.

About the Program: The GROW workshop series encourages female-identifying undergraduates to consider research in mathematics as a discipline and a career. For each of the past five years, approximately 80 students have gathered over a weekend in October for a mixture of research talks, panel discussions, and opportunities to meet students and scholars from across the country. The participants share meals and have numerous opportunities for networking and mentoring. GROW is designed to encourage women to think and know about mathematics and to feel confident about the options for graduate students, as well as provide them with resources for their future success.

The first iteration of the GROW series was designed by Bryna Kra at Northwestern University, and she, along with more than 40 volunteers, led the organization of the conferences at Northwestern from 2015 to 2017. Since then, GROW has moved first to the University of Michigan in 2018, with Sarah Koch and Karen Smith as lead organizers, and then to the University of Illinois at Urbana-Champaign in 2019, with Zoi Rapti as the lead organizer. The next series will be later this year at the University of Chicago. Over 350 students from across the country representing more than 75 undergraduate institutions have already participated in GROW.

The panel discussions cover what constitutes research in mathematics, with panelists sharing stories of their trajectories, an introduction to the varied options for careers in academia, and a wealth of information on the nuts and bolts of applying to graduate school in mathematics. A highlight of each meeting has been the Saturday evening dinner, with leading figures (including Alexandra Bellow, Dusa McDuff, Ingrid Daubechies, Kristin Lauter, and Marisa Eisenberg) giving inspirational talks.

About the Award: The AMS established the Mathematics Programs That Make a Difference award in 2005 to profile those programs that are succeeding and could serve as models for others. Specifically, the committee seeks to honor programs that:

- aim to bring more persons from underrepresented minority backgrounds into some portion of the pipeline beginning at the undergraduate level and leading to an advanced degree in mathematics and professional success, or retain them once in the pipeline;
- have achieved documentable success in doing so; and
- are replicable models.

Preference is given to programs with significant participation by underrepresented minorities.

AWM Workshop at the 2021 Joint Mathematics Meetings

Application deadline for graduate students: August 15, 2020

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

FORMAT: The workshop will consist of a Special Session focused on Analysis and PDEs organized by Donatella Danielli and Irina Mitrea and a Poster Session for graduate students. Selected junior and senior women from the Research Collaboration Conferences for Women (RCCW) WoAN, which was held at BIRS in June 2019, will be invited to give 20-minute talks in the Special Session on Women in Analysis and PDEs. The speakers will be supported by the National Science Foundation AWM ADVANCE grant: Career Advancement for Women Through Research Focused Networks. The Poster Session will be open to all areas of research; graduate students working in areas related to Analysis and PDEs are especially encouraged to apply. The graduate students will be selected through an application process to present posters at the Workshop Reception & Poster Session. With funding from NSF, AWM will offer partial support for travel and hotel accommodations for the selected graduate students. The workshop will include a reception, luncheon and a mentoring session where workshop participants will have the opportunity to meet with other women mathematicians at all stages of their careers. In particular, graduate students in analysis and PDEs will have the opportunity to connect with the Women in Analysis and PDEs (WoAN) Research Network.

All mathematicians (of any gender) are invited to attend the talks and poster presentations. Departments are urged to help graduate students and junior faculty who are not selected for the workshop to obtain institutional support to attend the presentations.

MENTORS: We also seek volunteers to act as mentors for graduate students as part of the workshop. If you are interested in volunteering, please contact the AWM office at awm@awm-math.org by **September 15, 2020**.

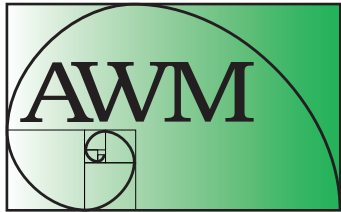
ELIGIBILITY: To be eligible for selection and funding, graduate students must have made substantial progress towards their theses. Women with grants or other sources of support are welcome to apply. All non-US citizens must have a current US address.

All applications should include:

- a title of the proposed poster
- an abstract in the form required for AMS Special Session submissions for the Joint Mathematics Meetings
- a curriculum vitae
- one letter of recommendation from the thesis advisor.

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

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For further information, see awm-math.org.



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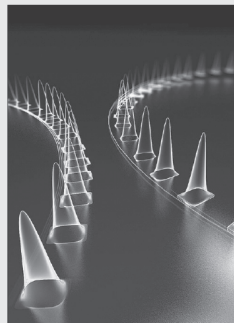
FALL 2021 SEMESTER PROGRAM

Hamiltonian Methods in Dispersive and Wave Evolution Equations

September 8 – December 10, 2021

Organizing Committee

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Program Description:

Dispersive equations are ubiquitous in nature. They govern the motion of waves in plasmas, ferromagnets, and elastic bodies, the propagation of light in optical fibers and of water in canals. They are relevant from the ocean scale down to atom condensates.

There has been much recent progress in different directions, in particular in the exploration of the phase space of solutions of semilinear equations, advances towards a soliton resolution conjecture, the study of asymptotic stability of physical systems, the theoretical and numerical study of weak turbulence and transfer of energy in systems out of equilibrium, the introduction of tools from probability and the recent incorporation of computer assisted proofs.

This semester, and its three affiliated workshops, aims to bring together these new developments and to explore their possible interconnection.

Details at: <https://icerm.brown.edu/programs/sp-f21/>

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MSRI Director Search 2022 APPLICATIONS NOW OPEN

The Mathematical Sciences Research Institute (MSRI) in Berkeley, California invites applications for the position of Director. **This appointment is for a five-year term beginning July 1, 2022, with the possibility of renewal.**

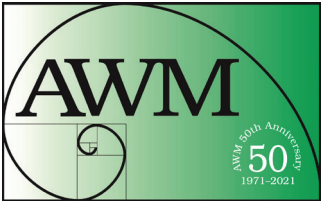
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Printed in the U.S.A.

ASSOCIATION FOR WOMEN IN MATHEMATICS

Volume 50, Number 4, July–August 2020

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