AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

Newsletter

VOLUME 47, NO. 2 • MARCH-APRIL 2017

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

4 AWM at the Atlanta JMM
22 Student Chapter Corner
23 AWM Hill Visit
26 Media Column
26 Book Review
28 Education Column
30 Science and the Women's March
31 AWM Research Symposium 2017

PRESIDENT'S REPORT

It is with great excitement that I write my first AWM President's report. First of all, thank you for trusting me with this job: I'll do my best; I'll also ask for, and willingly receive, your help.

On January 4, I took part in the "passing of the silver bowl" ceremony at the AWM Business Meeting at the Joint Mathematics Meetings in Atlanta. When Kristin Lauter gave me this symbol of AWM leadership, I made a joke about not being able to fill her shoes (I was born with abnormally short toes, and I really can't fill most peoples' shoes). But it's not really a joke. Kristin has been a wonderful AWM President. Her enthusiasm and energy have been both an inspiration and a catalyst for new initiatives promoting the recognition and visibility of women mathematicians and encouraging women to join our community. She has pushed our organization forward in many ways, and I will mention only a few favorites here.

Early in 2013, Kristin called me excitedly from the Institute for Mathematics and its Applications (IMA) in Minnesota. The director, Fadil Santosa, was interested in hosting a Research Collaboration Workshop in applied mathematics. I got in touch with my colleague, Trachette Jackson, to co-organize the workshop, and WhAM! (Women in Applied Mathematics!) was born. Trachette and I agree that this was the most fun and rewarding workshop we had ever participated in. The brainchild of Kristin and her colleagues in number theory, these collaborative workshops have important consequences for participants: new and lasting research collaborations are formed, and results are published as peer-reviewed articles. The AWM ADVANCE grant that Kristin spearheaded supports these workshops and has resulted in a dozen new collaboration workshops, with follow up sessions at the national meetings (see https://awmadvance.org/awm-advances/ for updates on all of the workshops and research networks).

The AWM mission is to support women and girls in their mathematical careers and to promote equal opportunity and the equal treatment of all in the mathematical sciences. Kristin has devoted a large chunk of her energy to building up our student chapter network. Under Kristin's leadership, the number of AWM student chapters has increased to over 100. As advocates for women in mathematics, our organization is one of the few voices for women mathematicians, period. In the last few years, under Kristin's leadership, the AWM has organized semi-annual Hill visits, where a group of AWM members including AWM leadership and as many students as possible visit Members of Congress to discuss current and future legislation. See page 23 for a report on the December 2016 Hill visit.

I could go on at length, listing Kristin's contributions: increasing international connections, representing us on a roster of national organizations, mobilizing our

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.

Circulation: 3500. © 2017, AWM

PRESIDENT'S REPORT *continued from page 1*

large tribe of volunteers to effective action. But I'll stop here, and allow each of us to reflect and be grateful for all that Kristin has done for us, for the AWM, and for the grander cause of building a more inclusive community. (*Pause for reflection …*)

The passing of the silver bowl was not the only highlight of the JMM. The AWM had a buffet of offerings and presentations, many of which are mentioned elsewhere in this issue. An extraordinary event, co-organized by the AWM, along with the National Association of Mathematics (NAM), Enhancing Diversity in Graduate Education (EDGE), Building Diversity in Science (BDIS) and the AMS, was "The Mathematics and Mathematicians Behind *Hidden Figures*" panel on Wednesday evening. The panel featured *Hidden Figures* author Margot Lee Shetterly and former "Human Computer" and Engineer, Dr. Christine Darden. Ulrica Wilson spoke about the mathematics of Dorothy Hoover, and Tanya Moore moderated the event. The event attracted over 500 JMM attendees: men, women, young and old. For me, it was particularly moving to see the reactions of the African-American women in the audience. It was clear that the issues faced by *Hidden Figures* protagonists Katherine Johnson, Dorothy Vaughan and Mary Jackson (and others, including Darden and Hoover, who were in the book but not the movie) are still very present today. It made me appreciate the critical role played by organizations such as the AWM in supporting *all* mathematicians, and in continuing efforts to change our culture. After the panel, Shetterly and Darden were presented with honorary memberships in NAM, while Wednesday evening at the AWM reception, they were given honorary AWM memberships.

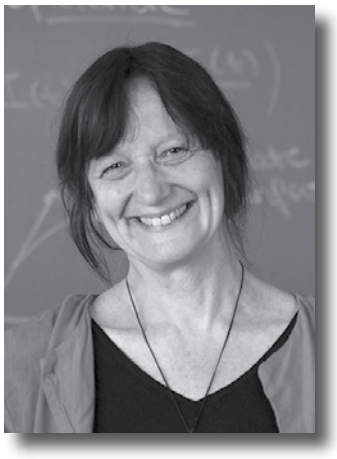
The reception was a festive celebration of achievements by our members. AWM awards and prizes were presented here and at other events to many outstanding women: Sara Clifton, Sarah Fleming, Helen Grundman, Kaitlin Hill, Catherine Hsu, Lisa Jeffrey, Katie Kavanagh, Lea Kenigsberg, Cathy Kessel, Hannah Larson, Michelle Manes, Maura Mast, Dana Mendelson, Gwyneth Moreland, Emmy Murphy, Emily Sergel, Yunqing Tang, Yen Nhi Truong Vu, and Marie Vitulli. Turn to pages 4–21 to learn more. Our Executive Director, Magnhild Lien, and past president Jill Pipher gave warm tributes to Kristin's presidency, and we closed with a song. I was truly warmed by the joyous mood, and the sense of community provided by all of our members and guests.

After the Hidden Figures panel: Ami Radunskaya, Ulrica Wilson, Lily Khadjavi, Christine Darden, Margot Lee Shetterly, Swarna Shah, Tanya Moore, Sylvia Bozeman, Kim Weems, and Edray Goins

It is this feeling of a warm, diverse community that I hope to carry forward with me through the next two years. On January 21, millions of women (and the men who support them!) gathered in cities across the world to show support for common values and to protest bullying of all sorts. (See page 30 for a report on the Washington, DC march.) The strength that comes from coming together as a community gives me hope—hope that we can change our culture in positive ways.

I eagerly look forward to working with you all and to serving you in the coming months. I also look forward to seeing many of you in Los Angeles at the 2017 AWM Symposium in April.

Ami Radunskaya
January 28, 2017
Claremont, CA



Ami Radunskaya

I've just found the proof
I'm very proud of lemma three
Which is the key.
It fills a major gap,
And I want all the world to see
It's right.
di-d-d-di'n 'di

Had it been back in the day
My write-up would belong to him
And my name would not appear
But as it is
It helps my *h*-index.
di-d-d-di'n 'di

(Chorus) Women, no longer hidden
we're mathematicians
so shout it loud.

I have never known
The like of this, I've been alone,
And I have missed things,
been kept out of sight,
But now we have the
A—W— M—.
di-d-d-di'n 'di

Women, no longer hidden
we're mathematicians
so shout it loud.

(To the tune of "I've just seen a face" by the Beatles)

Membership Dues
Membership runs from Oct. 1 to Sept. 30
Individual: $65 **Family:** $30
Contributing: $150
New member, affiliate and reciprocal members, retired, part-time: $30
Student, unemployed: $20
Outreach: $10

Institutional Membership Levels

Category 1: $325
Category 2: $325
Category 3: $200

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

Executive Sponsorship Levels

$5000+
$2500–$4999
$1000–$2499

Print Subscriptions and Back Orders—Regular and contributing members living in the US may elect to receive a print version of the *Newsletter.* Libraries, women's studies centers, non-mathematics departments, etc., may purchase a subscription for $65/year. Back orders are $10/issue plus shipping/handling ($5 minimum).

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

Newsletter Ads—AWM will accept ads for the *Newsletter* for positions available, programs in any of the mathematical sciences, professional activities and opportunities of interest to the AWM membership and other appropriate subjects. The Managing Director, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the* Newsletter *must be Affirmative Action/Equal Opportunity designated.* Institutional members receive discounts on ads; see the AWM website for details. For non-members, the rate is $116 for a basic four-line ad. Additional lines are $14 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, greenwaldsj@appstate.edu and Alice Silverberg, asilverb@math.uci.edu. Send everything else, including ads and address changes, to AWM, fax: 703-359-7562, e-mail: awm@awm-math.org.

ASSOCIATION FOR WOMEN IN MATHEMATICS

AWM ONLINE

The *AWM Newsletter* is freely available online.

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

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

Media Coordinator
Joanna Wares; jwares@richmond.edu

AWM DEADLINES

AWM Student Chapters Award:
April 15, 2017
AWM Louise Hay Award: April 30, 2017
AWM M. Gweneth Humphreys Award:
April 30, 2017
AWM Travel Grants:
May 1 and October 1, 2017
AWM Workshop at JMM: August 15, 2017
AWM-MAA Falconer Lecture:
September 1, 2017
AWM Alice T. Schafer Prize:
October 1, 2017

AWM OFFICE

Magnhild Lien, Executive Director
mlien@awm-math.org

Jennifer Lewis, Managing Director
jennifer@awm-math.org

Amanda Leibert, Membership Director
amanda@awm-math.org

11240 Waples Mill Road, Suite 200
Fairfax, VA 22030
phone: 703-934-0163
fax: 703-359-7562
awm@awm-math.org

The passing of the silver bowl

AWM AT THE ATLANTA JMM

AWM-AMS NOETHER LECTURE

The 2017 Noether Lecture, "Real Loci in Symplectic Manifolds," was delivered by Lisa Jeffrey, University of Toronto. She was introduced by Kristin Lauter, Microsoft Research.

Abstract: Let M be a symplectic manifold and let σ be an antisymplectic involution on M. The real locus is the fixed point set of the involution. It is a Lagrangian submanifold. Suppose also M is equipped with the Hamiltonian action of a torus T. It is possible to define a compatibility between T and M. This set of ideas was introduced in a 1983 paper by Hans Duistermaat. In this talk I will describe some developments in this field since Duistermaat's foundational paper. My contributions in this area are joint work with Liviu Mare and (in a separate project) with Nan-Kuo Ho, Khoa Dang Nguyen and Eugene Xia.

Citation for Lisa Jeffrey

Professor Lisa Jeffrey is being honored for her contributions and leadership in symplectic and algebraic geometry, focused on connections with theoretical physics. Jeffrey is a Professor of Mathematics at the University of Toronto, where she has been on the faculty since 1998. Before that, she held an assistant professorship at Princeton University, followed by an assistant professorship at McGill University. Jeffrey received her DPhil from Oxford University in 1992 under the supervision of Michael Atiyah. The work of her thesis provided mathematically rigorous proofs of conjectured statements about three-manifold invariants connected with quantum field theory.

Presentation of Noether Lecture plaque: Kristin Lauter and Lisa Jeffrey

Kristin Lauter presents the Louise Hay Award to Cathy Kessel

Jeffrey is best known for her joint work with Frances Kirwan on localization and moduli spaces. They determined the structure of the cohomology ring of the moduli space of representations of the fundamental group of a surface. This was an application of their earlier work, developed to study the cohomology rings of symplectic quotients. More recently, Jeffrey's work has been focused on the based loop group in K-theory. In joint work with Harada, Holm, and Mare, she showed the connectedness of the level sets of the moment map on the based loop group.

Professor Jeffrey has been an active mentor during her years at Toronto. Eleven students have obtained their PhDs under her guidance, and she is currently supervising six more. She has supported numerous postdoctoral fellows, and she has advised many undergraduates and master's students in thesis and reading projects.

AWM PRIZES

Louise Hay Award for Contributions to Mathematics Education

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

Citation for Catherine Kessel

The AWM presents the 2017 Louise Hay Award to **Catherine Kessel**, senior editor at Illustrative Mathematics. Kessel's clear, crisp scholarship has shaped the reports of investigations ranging from studies of mathematics curricula in East Asia to characterizations of East Asian teachers' shared knowledge of mathematics teaching (with implications for the professional development of US mathematics teachers) to the design and development of mathematics standards in the US. As a mathematician who possesses a unique ability for editing text, Kessel transforms what mathematicians write into a form readable by mathematics educators and the general public, without sacrificing precision. She also transforms what mathematics education researchers write into a form readable by mathematicians unfamiliar with the education literature.

continued on page 6

Just as critically, Kessel's contributions span the domains of school mathematics curricula, expectations defining the development of prospective and practicing teachers of mathematics, and mathematics assessment. She fosters productive interactions between often noncommunicating communities. Her public writings have been "a source of scholarship, evidence, and intellectual accountability in the debate" surrounding the Common Core State Standards for Mathematics.

Kessel has amassed a rich record of service, frequently addressing equity in education in general and women and mathematics in particular, based partly on her own work in the field of gender and mathematics. Through her mentoring, she has influenced the professional lives of aspiring and practicing mathematicians and mathematics educators.

A mathematician and educator fully reflective of the tradition of Louise Hay, Cathy Kessel is richly deserving of the 2017 Louise Hay Award.

Response from Kessel

Receiving this honor makes me very conscious of how many people have helped to improve my scholarship, writing, and editing, and deepen my knowledge of mathematics.

Although all my degrees are in mathematics, I've come to know education research and researchers, thanks to many at the School of Education at Berkeley, particularly Alan Schoenfeld. In learning about research on gender I've been fortunate to have the guidance of Marcia Linn.

Although I flunked my undergraduate writing exam, I've become an editor. Editing begins with reading and writing, and helping someone to improve these can be amazingly labor-intensive. Thanks to the University of Chicago writing program and all who took time to criticize my reading and writing (in, about, and outside of mathematics): teachers, co-authors, friends, colleagues, reviewers.

Helping someone learn to edit is also labor-intensive. Thanks to Alan Schoenfeld for an entrée, and many others for editing opportunities and advice. I've been fortunate to work with many writers who have graciously responded to questions, helping me better understand their thinking.

Although most of my life has been in the US and I speak no Asian language, I've been able to learn about East Asian mathematics education from Catherine Lewis, Global Education Resources, Myong-Hi Kim, and many years of work with Liping Ma.

Although I've been a solitary consultant much of my life, I've benefited from interaction with the mathematical community, thanks to several organizations, including Mathematicians and Education Reform (and Naomi Fisher), and especially the Association for Women in Mathematics.

CALL FOR NOMINATIONS

The 2017 Etta Z. Falconer Lecture

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

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

The letter of nomination should include an outline of the nominee's distinguished contributions to the mathematical sciences or mathematics education and address the nominee's capability of delivering an expository lecture. 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 **September 1, 2017** and will be held active for two years. If you have questions, phone 703-934-0163 or email awm@awm-math.org.

Kristin Lauter and Helen Grundman

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

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

Citation for Helen G. Grundman

The Association for Women in Mathematics is pleased to present its seventh annual M. Gweneth Humphreys Award to **Helen G. Grundman**, Professor Emeritus of Mathematics at Bryn Mawr College and inaugural Director of Education and Diversity at the American Mathematical Society.

At Bryn Mawr, Dr. Grundman has an impressive record of mentoring female undergraduate students, many of whom have now earned graduate degrees in mathematics, physics, computer science, or other professional programs. Not only has she mentored students from her classes, but her guidance has extended to students of all levels seeking advice on coursework, summer research programs, senior theses, and careers. In recent years, three of her mentees have received NSF Graduate Research Fellowships to continue their studies in mathematics. While at Bryn Mawr, she has served as a research advisor for over twenty-five senior undergraduate theses, Master's theses, and PhD dissertations. The undergraduate research has resulted in at least eight published papers co-authored with her students.

She has received high praise for her work with undergraduates in the Distressing Math Collective, a weekly informal math seminar/club that she created with some students almost twenty years ago. Students gather to give and to listen to math talks in a friendly, gregarious atmosphere, in which interruptions (and jokes) are encouraged. The students learn math, develop their public speaking skills, (get some mentoring,) and find comradery in an environment where it is normal to enjoy math.

Setting Grundman apart from other professors is her beautifully sincere and long-lasting support of students beyond graduation. One student comments that "her support is the more remarkable because there was no formal relationship between us—she had never taught me in a course or been assigned as my major advisor," while another student states "that kind of unwavering and unconditional support, which is so rare to find in mathematics, allowed me to reach out to her for help during the times I needed it most in graduate school."

Response from Grundman

I am deeply honored to receive the AWM's M. Gweneth Humphreys Award. I am also extremely humbled by the many notes and letters that former students of mine wrote in support of this nomination and were kind enough to share with me. My sincere thanks to all of them and, of course, to the award selection committee.

It is wonderful to be reminded how the seemingly little things that we do can have such major positive impacts on our students' lives. As I move into my new career, I hope to continue to pay attention to the small things that I can do for individuals, even while I work on larger projects for the mathematics community.

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

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

continued on page 8

mathematics throughout her career. The criteria for selection include, but are not limited to, the quality of the nominee's performance in mathematics courses and special programs, an exhibition of real interest in mathematics, the ability to do independent work, and (if applicable) performance in mathematical competitions.

AWM was pleased to present the twenty-seventh annual Alice T. Schafer Prizes at the AWM Reception and Awards Presentation. Hannah Larson, Harvard University is the prize-winner. Sarah McClain Fleming, Williams College, is runner-up, while Lea Kenigsberg, Stony Brook University, Gwyneth Moreland, University of Michigan, and Yen Nhi Truong Vu, Amherst College, received honorable mentions.

Yen Nhi Truong Vu and Hannah Larson (Sarah McClain Fleming, Lea Kenigsberg, and Gwyneth Moreland were unable to attend)

Citation for Hannah Larson, winner

Hannah Larson is a senior mathematics major at Harvard University where she is a Herchel Smith Harvard Undergraduate Science Research Fellow and Barry M. Goldwater Scholarship recipient. She has been doing "jaw-dropping" mathematical work since she was a high school student when she won the Davidson Fellowship for her work on fusion categories. At Harvard, she has been taking advanced graduate courses such as algebraic geometry where she "sailed through the course; she did all the assignments and did them perfectly" and algebraic curves where she "was at the top of the class."

Larson did research at the University of Oregon as a high school student, participated in the Number Theory REU at Emory for three summers, and did research at

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, 2017. 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 2018 Joint Mathematics Meetings in San Diego, CA.

The letter of nomination should include, but is not limited to, an evaluation of the nominee on the following criteria: quality of performance in advanced mathematics courses and special programs, demonstration of real interest in mathematics, ability for independent work in mathematics, and performance in mathematical competitions at the local or national level, if any.

With the letter of nomination, please include a copy of transcripts and indicate undergraduate level. Any additional supporting materials (e.g., reports from summer work using math, copies of talks, recommendation letters from professors, colleagues, etc.) should be enclosed with the nomination. All nomination material is to be submitted as ONE PDF file via MathPrograms.Org with a copy of transcripts included at the end of the file. The submission link will be available 45 days prior to the deadline. Nominations must be received by **October 1, 2017**. If you have questions, phone 703-934-0163, email awm@awm-math.org, or visit www.awm-math.org.

Harvard for one summer. She has published eight papers in a variety of fields: number theory, algebra, combinatorics and moonshine. Her work in moonshine, for example, was an extension of Borcherds' Fields Medal work. She was able to answer a question posed by Ed Witten. "Her work was completely unexpected.... This reordering is presently a mystery in the math physics community, and it is called the 'Larson Anomaly.' "

As her mentors say, "Hannah Larson is a phenomenon. She has been a star for many years, first as a high school student in Oregon.... Incredibly, she wrote five papers in the summer of 2015.... I have never witnessed anything like Hannah's 2015 REU performance." "She is an exceptional student." "She will be a star."

Response from Larson

I am very honored to receive the 2017 Alice T. Schafer Prize. I would like to thank the Association for Women in Mathematics for creating this prize and supporting women in math. I would also like to thank my professors and mentors for their incredible support, without which I would not be here today. I am especially grateful to Professor Victor Ostrik for mentoring my first research project in high school, to Professor Ken Ono for challenging me with interesting problems at his Research Experience for Undergraduates at Emory University and for his years of steadfast support and counsel, and to Professor Joe Harris for his inspiring teaching and advising my senior thesis. I also want to thank my middle school math teacher, Marna Knoer, for sparking my interest in math. Finally, thank you to my family for their love and encouragement, and especially to my older brother and role model, Eric Larson.

Citation for Sarah McClain Fleming, runner-up

Sarah McClain Fleming is a senior at Williams College. She is active in her department and vice president of the Williams College AWM chapter. She has received a Goldwater Scholarship and the Erastus C. Benedict, Class of 1821, Prize in Mathematics that recognizes sophomore math majors. Starting from her first semester at Williams, she "greatly enjoyed studying advanced topics in mathematics and [her instructors were] delighted to observe, throughout the semester, her talent and passion for both mathematics and physics."

Fleming has "produced an impressive amount of original research in mathematics." She has participated in the SMALL REU at Williams College and REUs at Emory University and the University of Michigan. Fleming "has superb mathematical talent and approaches problems with great energy and creativity." Her research has focused on a range of algebra topics and as part of these experiences she has written four papers. Two of these papers are submitted to journals, and the other two have been accepted for publication.

Fleming's mentors describe the rich mathematical conversations they have had with her: it is a "tremendous joy to talk to a student with so much drive and passion for mathematics!" They also praise her enthusiasm and understanding. "She is exceptionally strong, talented and passionate about mathematics" and "her potential for a successful research career in mathematics is incredibly high."

continued on page 10

CALL FOR NOMINATIONS

2018 Louise Hay Award

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

The nomination documents should include: a one to three page letter of nomination highlighting the exceptional contributions of the candidate to be recognized, a curriculum vitae of the candidate not to exceed three pages, and three letters supporting the nomination. It is strongly recommended that the letters represent a range of constituents affected by the nominee's work. Nomination materials for the Hay Award shall be submitted online. See the AWM website at www.awm-math.org for nomination instructions. Nominations must be received by **April 30, 2017** and will be kept active for three years. For more information, phone (703) 934-0163, email awm@awm-math.org or visit www.awm-math.org.

Response from Fleming

I am deeply honored to be selected as the runner-up for the Alice T. Schafer Prize. I greatly appreciate the AWM's invaluable work in supporting women in mathematics, especially at the early stages of their careers. I hope to contribute to furthering this mission. I have been extremely fortunate to study in the fantastic Williams College Department of Mathematics, which places a strong emphasis on undergraduate research and mentorship. Professor Susan Loepp has been an ideal research advisor and excellent role model. In addition, Professor Mihai Stoiciu has inspired me with his continued encouragement and infectious love of mathematics. Participating in the SMALL REU and being a Clare Boothe Luce Scholar at Williams have fostered my development as a mathematician. I have also benefitted immensely from the REUs at Emory University and University of Michigan, which introduced me to a number of exciting research questions. I would like to thank Professor Ken Ono for his boundless enthusiasm and commitment to mathematics and his students. I am also grateful to Professor Mel Hochster for his wisdom, understanding, and patience. Finally, I am indebted to my parents for encouraging me to pursue my passion for mathematics and for raising me and my sister to question and challenge gender stereotypes from a young age.

Citation for Lea Kenigsberg, honorable mention

Lea Kenigsberg is a senior mathematics major at Stony Brook University who holds a Barry M. Goldwater Scholarship; she has excelled in challenging courses both at Stony Brook and as a participant in the Women in Math program at the Institute for Advanced Studies. She is described as "act[ing] as an engine for the class: asking pertinent questions and finding mistakes, as well as encouraging all of the class to deepen their understanding."

Kenigsberg has done research in spectral analysis at the Rutgers University REU and in geometry at Williams' SMALL program. At the latter she proved a result settling an open "conjecture of wide interest" in work described as "a major result that required much faith and persistence."

Kenigsberg's mentors praise her "serious passion for math," describing her as "absolutely outstanding" and "at the

CALL FOR NOMINATIONS

2018 M. Gweneth Humphreys Award

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

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

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

Nomination materials for the Humphreys Award shall be submitted online. See the AWM website at www.awm-math.org for nomination instructions. Nominations must be received by **April 30, 2017** and will be kept active for three years at the request of the nominator. For more information, phone (703) 934-0163, email awm@awm-math.org or visit www.awm-math.org/humphreysaward.html.

start of a notable career in mathematics." "She will leave the mathematical world in a better state than when she found it, from the human and intellectual point of view."

Response from Kenigsberg

I am fortunate to be a part of the Stony Brook mathematics department, where our passion for mathematics exceeds the importance of standardized tests and exams. Specifically, I would like to thank Moira Chas for being my role model and for sharing with me her unique way of doing mathematics. I would like to thank Marco Martens and Chris Bishop for wonderful captivating lectures. I am grateful to Frank Morgan for his guidance, and for introducing me to creative problems during the SMALL REU. I wish to thank Alex Kontorovich for a wonderful research experience, and for communicating to me a problem in the intersection of physics and math. Finally, I would like to thank Dennis Sullivan for his inspiring way of thinking. I thank the AWM for all that they do for women, and I hope that one day I will be able to help underrepresented groups in mathematics too.

Citation for Gwyneth Moreland, honorable mention

Gwyneth Moreland is a senior mathematics major at the University of Michigan who holds a Barry M. Goldwater Scholarship and has won three named mathematics prizes at Michigan: the William LeVeque Award in algebra, the Jack McLaughlin Award in number theory, and the Evelyn O. Bychinsky Award.

Moreland worked on number theory research projects with Michigan faculty in high school; she has since participated in REUs at the University of Chicago, Williams (the SMALL program), and Michigan, and has two papers under review. She is co-president of Michigan's Society for Undergraduate Math Students and has worked with high school students at both the Michigan Math and Science Scholars program and the Ross Mathematics Program at Ohio State. Moreland's mentors describe her as "a fantastic student" with an "excellent track record in research" who is able to "get at the essence of questions or problems."

Response from Moreland

I am grateful to be chosen as an honorable mention for this year's Alice T. Schafer prize. I would first like to thank the Association for Women in Mathematics for supporting and encouraging young women in the field. I would like to thank Stephen DeBacker of the University of Michigan for his advice and guidance over the past four years, which have been invaluable to my mathematical career. I would also like to thank Wei Ho of UM for her teaching and for being a role model for me and other women in the department. Furthermore, I would like to thank Steven Miller of Williams College for leading the number theory group at the SMALL 2015 REU and for all his help during and since the program.

Citation for Yen Nhi Truong Vu, honorable mention

Yen Nhi Truong Vu is a senior at Amherst College where she is a recipient of the Charles W. Cole Scholarship, the Walker Prize and the Hamilton Prize. She has received high marks in her courses at Amherst as well as courses at MIT and University of Paris. "Her performance on every item assigned … was essentially perfect. She is meticulous and strives to understand every last detail."

Truong Vu participated in the SMALL REU at Williams College where she worked on random matrix ensembles, low-lying zeros of L-functions, generalized Zekendorf decompositions, and integer complexity. She also participated in summer research at Amherst College. At Amherst, her group worked on modular and mock modular forms. "Nhi was the leader in her summer research group, driving the team to discuss and prove theorems." Their work was published in the *Journal of Number Theory*.

As one of her mentors describes her, Truong Vu "is truly outstanding. She is the best female student I have ever encountered … and among the very, very best of any gender. She is extremely hardworking, a devourer of mathematics, ambitious, and extremely strong in terms of her mathematical abilities and talents. She is a leader in and out of the classroom, and an outstanding mathematical citizen."

Response from Truong Vu

It is truly an honor to be named as an honorable mention of the Schafer Prize. I would like to thank the AWM for offering this prize, and beyond that, for supporting women in their pursuit of a career in mathematics. I am deeply grateful to many people who have encouraged and inspired me in my mathematics education. In particular, I would like to express my deepest gratitude to Professor Amanda Folsom for her generous support, meticulous guidance and tremendous inspiration during the past three years. She has provided me with many opportunities to grow mathematically, showed me the beauty and excitement of mathematical research, taught me the value of perseverance and hard work, and shaped my perspective and interests with her astounding passion and insights. I am also deeply grateful to Professor Steven J. Miller, my advisor at the SMALL REU, for devoting so much of his knowledge, time and effort in guiding my

continued on page 12

research group both during and beyond the past summer, both in academics and in life. I would also like to thank the entire math faculty at Amherst College for their dedication to teaching and for creating a wonderful learning environment. Finally, I warmly thank my friend and collaborator, Roger Van Peski, for accompanying me in our wonderful pursuit of mathematics throughout the many sleepless, non-decadent nights.

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

The Executive Committee of the Association for Women in Mathematics established the AWM-Birman Research Prize in Topology and Geometry in 2013. First presented in 2015, this prize is awarded every other year. The purpose of the award is to highlight exceptional research in topology/geometry by a woman early in her career. The field will be broadly interpreted to include topology, geometry, geometric group theory, and related areas. Candidates should be women, based at US institutions who are within ten years of receiving their PhD, or having not yet received tenure, at the nomination deadline.

The AWM-Joan & Joseph Birman Research Prize in Topology and Geometry serves to highlight to the community outstanding contributions by women in the field and to advance the careers of the prize recipients. The award is made possible by a generous contribution from Joan Birman, whose work has been in low-dimensional topology, and her husband Joseph, who is a theoretical physicist whose specialty is applications of group theory to solid state physics.

Citation for Emmy Murphy

The 2017 Joan & Joseph Birman Research Prize in Topology and Geometry is awarded to **Emmy Murphy**, Massachusetts Institute of Technology (MIT), for major breakthroughs in symplectic geometry.

Murphy has developed new techniques for the study of symplectic and contact structures on manifolds, uncovering a startling degree of flexibility in a branch of geometry that is ordinarily distinguished by rigidity. As a result, some geometric problems can now be reduced to homotopy theory; for example, Murphy's methods have yielded answers to long-standing questions concerning the existence of contact structures on high-dimensional manifolds. She has shown great creativity in the delicate work of inventing powerful new h-principle techniques. She has also masterfully combined these new tools with other tools, such as the method of pseudo-holomorphic curves, to explore the boundary between flexibility and rigidity.

Kristin Lauter and Emmy Murphy

Murphy is a highly original thinker, and leading geometers will not be surprised if she goes on to make breakthroughs in very different areas of mathematics.

Response from Murphy

I am very honored to be a recipient of the Joan & Joseph Birman Prize. My work would never have been possible without my many mentors, particularly Chris Herald, Alex Kumjian, Tom Mrowka, and Paul Seidel. I would also like to thank my collaborators for stimulating and inspiring ideas, particularly Strom Borman, Roger Casals, Baptiste Chantraine, Mike Freedman, and Fran Presas. Yasha Eliashberg deserves special mention, as a wonderful advisor, collaborator, and friend. I'd like to thank Joan and Joseph Birman for being so generous and supportive of the women in the mathematics community. Joan is certainly an inspiration to me. There are many people in mathematics who deserve my warmest thanks, but cannot be listed here. And of course, I'd like to thank my family and friends for their love and support.

Finally, I'm grateful to the selection committee for the recognition of my work, and the kind words. I have always had an appreciation for highly visual and geometric questions, and I'm very happy to find places where this kind of thinking is useful. Symplectic and contact geometry, though very fashionable, are still very young fields. And though we've developed a lot of machinery in recent years, there are still many basic questions we don't know the answer to, and

I believe many deep theorems can still be proven from first principles. I'm very excited to see where the field will go in upcoming years.

AWM Dissertation Prizes

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 inaugural prizes were awarded to **Dana Mendelson** for "Nonlinear dispersive equations with random initial data," **Emily Sergel** for "The combinatorics of ∇p_n and connections to the Rational Shuffle Conjecture," and **Yunqing Tang** for "Algebraicity criteria and their applications."

Citation for Dana Mendelson

Dana Mendelson obtained her PhD in 2015 at MIT under the direction of Gigliola Staffilani. She received a NSERC Postgraduate Doctoral Fellowship and a Viterbi Endowed Postdoctoral Fellowship and has been invited to give numerous seminars on her dissertation research. Currently, she is an L.E. Dickson Instructor in the Department of Mathematics at the University of Chicago.

Mendelson's dissertation is at the intersection of probability theory and partial differential equations. In her dissertation, she established two significant results on nonlinear wave equations. The first result, published with Jonas Lührmann in *Communications in Partial Differential Equations*, involves an almost sure global existence for the defocusing nonlinear wave equation of power-type. This paper has received many citations. In the second part, Mendelson verified a non-squeezing result for the periodic cubic nonlinear Klein-Gordon equation. This result has inspired others to apply her methods to related problems.

Response from Mendelson

It is an honor to be the recipient of an inaugural AWM dissertation award. I am thankful to the AWM for this recognition and for their ongoing support of women mathematicians, especially those in the early stages of their careers.

I am particularly indebted to my thesis adviser, Gigliola Staffilani, for giving me the opportunity to expand my mathematical horizons and for her patient and kind supervision. I also extend my appreciation to Andrea Nahmod for her mentorship, to Jonas Lührmann for our ongoing collaboration, which led to a chapter in my thesis, to Jared Speck and David Jerison for serving on my thesis committee and for valuable feedback on early drafts of my dissertation,

continued on page 14

CALL FOR NOMINATIONS

The Association for Women in Mathematics Student Chapter Awards

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

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

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

The nomination should include: 1) A cover letter: The cover letter should summarize the chapter's qualifications for the award category to which it is nominating itself. If the chapter is applying in more than one category, it should ensure that all categories are clearly included on one cover letter. 2) An activities report: The activities report, 500–1000 words in length, should give a detailed description of the particular work for which it is seeking an award. If the chapter is applying in more than one category, a separate activities report is required for each. Nomination materials should be submitted online at MathPrograms.Org. The submission link will be available 45 days prior to the nomination deadline. Nominations must be received by **April 15, 2017**. If you have questions, phone 703-934-0163, email awm@awm-math.org, or visit www.awm-math.org.

and to my friends, colleagues and mentors who contributed to the supportive environment at MIT.

My thesis topics continue to raise questions that intrigue and excite me, and I feel fortunate to have further opportunities to pursue these and other topics under the mentorship of Carlos Kenig at the University of Chicago.

Citation for Emily Sergel

Emily Sergel received her PhD from the University of California, San Diego in 2016 under the supervision of Adriano Garsia. She is currently an NSF Postdoctoral Fellow at the University of Pennsylvania where Jim Haglund is her sponsoring scientist.

Sergel's thesis contains multiple results relating algebraic combinatorics, symmetric function theory, and representation theory. The combinatorial objects she studies, now in an algebraic setting, were originally constructed to model the everyday task of parking cars. In her thesis, she shows great originality, technical skill, and impressive breadth.

In her thesis Sergel proves the Square Path Conjecture made by Loehr and Warrington in 2007, that ∇p_n can be expressed as a weighted sum of certain labeled lattice paths (called labeled square paths). Other than a special case proved shortly after the conjecture was announced, prior to Sergel's work little progress was made. A letter writer describes this as an outstanding result, and says it is remarkable a student attained this result.

Another chapter of her thesis describes significant progress on the Rational Shuffle Conjecture that she and collaborators made; their work will appear in *Journal of Combinatorial Theory, Series A*. Finally, she and her advisor Adriano Garsia introduce a new combinatorial interpretation of ∇p_n.

Response from Sergel

I am very honored to be one of the first recipients of the AWM Dissertation Prize.

My dissertation work would not have been possible without the overwhelming personal and mathematical support of my advisor, Adriano Garsia. I consider Adriano to be the patriarch of a warm and active mathematical community within algebraic combinatorics. Being a part of this community has been an essential to my mathematical life. I give my thanks to everyone in this community, but especially to Jim Haglund, Jeff Remmel, and Angela Hicks for their time and encouragement.

On a more personal note, I want to thank the people who first encouraged and inspired me to become a mathematician: my mother, Marianne Moore; my high school teacher, Shelby Aaberg; and my undergraduate advisor and close friend, János Komlós. Their combined support gave me the confidence I needed to start and finish graduate school.

Finally, I want to acknowledge the people who selected me for this award and those who created it. It is a great distinction and a wonderful personal encouragement for which I am very thankful.

Yunqing Tang, Emily Sergel, and Dana Mendelson

Citation for Yunqing Tang

Yunqing Tang received her PhD from Harvard University in 2016 under the supervision of Mark Kisin. She is currently a member at the Institute for Advanced Study. In 2015–16 Tang received a Merit Research Fellowship from the Graduate School of Arts and Sciences at Harvard, and in 2016 she received the New World Mathematics Award for Chinese students for her PhD thesis.

Tang's thesis under the direction of Mark Kisin touches two of the most difficult problems in arithmetic geometry: the famous Grothendieck-Katz p-curvature conjecture, which goes back over 30 years, and the Ogus crystalline Mumford-Tate conjecture. Tang made very important progress on both problems. She proved the Grothendieck-Katz conjecture under a weaker but natural condition. To prove her result she makes very creative use of a recent criterion on algebraicity by André, Bost, and Chambert-Loir.

She also obtained results on a conjecture of Ogus which predicts that certain cycles in de Rham cohomology arise from Hodge cycles; it may be thought of as an analogue of the Mumford-Tate conjecture concerning Frobenii coming from crystalline cohomology. Tang was able to prove Ogus' conjecture for abelian varieties in a large number of cases by

using ideas of Pink and Serre on the Mumford-Tate conjecture for abelian varieties.

In her thesis, Tang shows not only extremely impressive technical breadth, but also real originality in making serious progress on important long standing open problems.

Response from Tang

I am deeply honored to be a recipient of the AWM Dissertation Prize. It is a great pleasure to thank my thesis advisor Mark Kisin for introducing me to research, for numerous discussions, and for supportive encouragement. I would also like to thank the faculty members and the (current and former) graduate students of the Harvard Mathematics Department both for teaching me mathematics and for warm support. A large number of people whom I met at conferences, seminars, and winter or summer schools provided helpful comments and suggestions regarding my thesis work, and I would like to thank them for sharing their ideas. Thanks is also due to my family and friends for their support. Finally, I would like to thank the selection committee for their kind attention to my work.

AWM Service Awards

The Association for Women in Mathematics presented Katie Kavanagh, Michelle Manes, Maura Mast and Marie Vitulli with AWM Service Awards at the AWM Reception and Awards Presentation. The AWM Service Award, established by the AWM Executive Committee (EC) in November 2012, recognizes individuals for helping to promote and support women in mathematics through exceptional voluntary service to the association. The award is given annually to a select group of volunteers in recognition of their extensive time and effort devoted to AWM activities during the previous seven years. Presidents (past, present, and -elect) and current officers are not eligible for the award.

Maura Mast and Michelle Manes (Katie Kavanagh and Marie Vitulli were unable to attend)

Katie (Fowler) Kavanagh, Clarkson University, is recognized for her active involvement as chair of the AWM Student Chapters Committee, 2012–2016. In her role as committee chair, Kavanagh was instrumental in reviving the committee and setting up new processes for the AWM to stay connected with its student chapters. She worked closely with the AWM president to set up the first webinar with the student chapters. Kavanagh handled student chapter submissions for the Student Chapter Corner of the *Newsletter*, a new initiative during her term as chair of the Student Chapter Committee. She has organized student participation at the MAA MathFest, including the poster session at the highly successful MathFest 100 in 2015.

Michelle Manes, University of Hawaii, is recognized for her active involvement with the AWM on several fronts. She serves as chair of the JMM Committee, a subcommittee of the AWM Meetings Committee, and has organized the AWM panel at JMM for the last two years. She has been very active in helping to get the processes for the new ADVANCE grant working. She serves as chair of the (new) committee to create new networks, drafting a call for proposals to the math community and handling the communications with and submissions from new networks. She also serves on the committee to help established research networks get organized to create web pages, steering committees and email lists.

Maura Mast, Fordham University, is recognized for her active involvement with the AWM on several fronts. In 2012, two years after finishing eight years of service as AWM Clerk, Mast was elected for a four-year term to serve again on the AWM EC. She served as the AWM representative to the Joint Committee on Women in the Mathematical Sciences for seven years (2006 through 2012). She was an active member of the Meetings Portfolio the four years she was an EC member-at-large. In particular, she served as chair of the MathFest sub-committee. Before that Mast was the main force behind organizing the AWM panels held at MathFest. During her years of service to the AWM Maura has been a regular volunteer for staffing the AWM booth at MathFest and JMM. She is currently co-chairing the AWM Fund Development Committee.

continued on page 16

Marie Vitulli, University of Oregon, is recognized for her active involvement with the AWM on several fronts. Vitulli served on the AWM EC as a member-at-large for six years. As chair of the Policy and Advocacy Portfolio she was very active and involved in creating statements and policies for the organization. She currently serves on the AWM Financial Oversight and Investment Committee. For several years Vitulli has been volunteering to help the treasurer with budget preparation and analysis. She has been active in the process of identifying a new database system for the AWM. Even though Vitulli has finished her term on the EC (in 2016) she does almost daily posts on our Facebook page to promote AWM and issues related to our mission. In addition, she is an active proponent of better representation of women in mathematics on Wikipedia, and she maintains a Women in Mathematics website.

Hidden Figures author Margot Shetterly, Kristin Lauter, NASA engineer Christine Darden

AWM Workshop

Magnhild Lien, AWM Executive Director

The 2017 Joint Mathematics Meetings were held January 4–7, 2017 in Atlanta, Georgia. The two-part AWM Workshop started on Friday evening with a reception and a **Poster Session** for graduate students. The workshop continued on Saturday with a **Special Session** on Number Theory for invited junior and senior speakers, supported by the AWM ADVANCE grant, Career Advancement for Women Through Research Focused Networks. This format allowed for a larger number of workshop participants than in previous years, as well as greater exposure of their work presented either in a poster or a talk. Also on Saturday, there was a mentoring session and luncheon for all the workshop participants. Special thanks go to the workshop organizers **Alina Bucur**, University of California, San Diego (number theory session), **Ellen Eischen**, University of Oregon (number theory session), **Matilde Lalín**, Université de Montréal (poster session), **Rosa Orellana**, Dartmouth College (poster session) and **Anne Shepler**, University of North Texas (poster session). Their dedication and enthusiasm while planning the workshop were instrumental in its success.

At the workshop reception on Friday evening nineteen graduate students presented their posters. The twentieth participant was not able to attend the workshop, as her flight was canceled due to the bad winter weather that hit Atlanta during the meeting. There was a steady stream of conference attendees coming by—and not just for the refreshments! The session was scheduled for one hour and fifteen minutes, but people showed up early and stayed later. The graduate students seemed genuinely excited to showcase their work. One part of the workshop program is for the workshop participants to meet with pre-assigned mentors. For many of the participants the first contact with their mentors was during the poster session.

The nineteen poster presenters were: **Bahar Acu**, University of Southern California and University of California, Los Angeles; **Erin Brownlee**, North Dakota State University; **Sneha Chaubey**, University of Illinois at Urbana-Champaign; **Sara M. Clifton**, Northwestern University; **T. Mihiri M. De Silva**, Texas Tech University; **Maranda Franke**, University of Nebraska–Lincoln; **Kaitlin Hill**, Northwestern University; **Natalie Hobson**, University of Georgia; **Catherine M. Hsu**, University of Oregon; **Rachel Kirsch**, University of Nebraska–Lincoln; **Melinda Lanius**, University of Illinois at Urbana-Champaign; **Junxian Li**, University of Illinois at Urbana-Champaign; **Sarah Loeb**, University of Illinois at Urbana-Champaign; **Amita Malik**, University of Illinois at Urbana-Champaign; **Alicia Marino**, Wesleyan University; **Lucia Mocz**, Princeton University; **Yu Pan**, Duke University; **R. Melody Takeuchi**, Tufts University; and **Stefanie Wang**, Iowa State University. For titles and abstracts of the posters visit https://sites.google.com/site/awmmath/awm-at-jmm and click on AWM Workshop 2017.

Poster judging, a feature started three years ago, is now a regular part of the workshop. In coordination with the NSF Math Institutes we are able to offer an invitation to participate in a week-long workshop at one of the institutes as a prize for the best poster. Twenty volunteer judges evaluated the posters, and there was a three-way tie for the best poster. The three winners were Sara Clifton, Kaitlin Hill and Catherine Hsu. All three received the institute prize.

During the mentoring session and luncheon on Saturday the graduate students and the junior speakers in the number theory session met with their mentors. The winners of the poster judging competition were presented with certificates and all the poster presenters were given forms from the judges with feedback on their poster presentation. The attendees at the luncheon included the workshop participants, the mentors, the special session organizers, AWM president Kristin Lauter, AWM president-elect Ami Radunskaya, Humphreys Award recipient Helen Grundman, poster judging coordinator Sylvia Wiegand, and the AWM Executive Director. Also present was Leslie Hogben, who is a co-chair of the Mathematical Sciences Institutes Diversity Committee and the person who coordinates with the institutes in regards to the poster prizes.

Top row: Ellen Eischen, Alina Bucur (organizers); middle row: Cristina Ballentine, Christelle Vincent, Adriana Salerno, Michelle Manes, Katherine Stange, Rachel Davis, Valentijn Karemaker, Fan-Ting Tu; front row: Jennifer Berg, Anna Haensch

Sara Clifton, Catherine Hsu, Kristin Lauter, and Kaitlin Hill

This year's workshop talks focused on the field of number theory and the special session organized by **Ellen Eischen** and **Alina Bucur** was a huge success. There were many excellent talks, and the workshop was well-attended despite being scheduled at the same time as several other sessions on number theory and several other sessions focused on women in mathematics. We also received a lot of positive feedback from attendees. The program was intended to highlight the research done by the groups at two Research Collaboration Conferences for Women: Women In Numbers – Europe (WINE) at Luminy, France in 2013 and WIN3 at Banff International Research Station in 2014. The proceedings volumes from both of those conferences have been published in the AWM Springer Series, and many of the papers from those volumes were presented at the workshop. The workshop was supported by the AWM ADVANCE grant and served as an opportunity for women researchers from the WIN Network to meet, exchange ideas, and engage in formal and informal mentoring.

continued on page 18

In the morning session, **Valentijn Karemaker**, **Cristina Ballantine**, **Ruthi Hortsch**, **Adriana Salerno**, and **Sharon Frechette** presented work published by groups from the WINE conference. Representing groups from the WIN3 conference, **Katherine Stange**, **Christelle Vincent**, **Jennifer Berg**, **Kirsten Wickelgren**, **Rachel Davis**, **Anna Haensch**, **Fang-Ting Tu**, and **Jessica Fintzen** covered research on topics from cryptography to curves and codes. **Michelle Manes** concluded the workshop with an overview talk, "The Impact of WIN Conferences," spanning projects from many WIN conferences.

Titles and abstracts of the talks can be found at awmadvance.org.

A special thanks to **Cristina Ballantine**, **Julia Bergner**, **Sharon Frechette**, **Leslie Hogben**, **Aimee Johnson**, **Kate Kearney**, **Suzanne Lenhart**, **Connie Liaw**, **Michelle Manes**, **Judith Packer**, **Adriana Salerno**, and **Katherine Stange** for serving as mentors to the graduate students and the junior speakers in the number theory session. These women shared their varied experiences and provided invaluable guidance to the "younger" mathematicians.

Also, many thanks to **Sylvia Wiegand**, the organizer of the poster judging and the volunteer judges **Sukanya Basu**, **Randall Cone**, **Rebecca Conley**, **Meghan DeWitt**, **John Diamantopoulos**, **Amanda Folsom**, **Elizabeth Gillaspy**, **Megan M. Kerr**, **Vesna Kilibarda**, **Zhe Liu, Yanping Ma**, **Bozenna Pasik-Duncan**, **Emma Previato**, **Shelley B. Rohde**, **David Saltman**, **Mandi Schaeffer Fry**, **Khang Tran**, **Kartik Venkatram**, **Emilie Wiesner**, and **Ling Xu**. Sylvia's tireless effort in organizing this event and the volunteers' eagerness to participate, not only doing the judging but also meeting afterwards to tally the scores, made it all run very smoothly. Finally, a special thank you to AWM Managing Director Jennifer Lewis, who oversaw the setup of the poster session as well as helped the judges tabulating the scores for the poster judging.

The 2017 AWM workshop was made possible by funding from the National Science Foundation through the ADVANCE grant "Career Advancement for Women Through Research-Focused Networks" (NSF-HRD 1500481) and NSF grant "Graduate Student Participation in National Workshops to Encourage Women's Engagement in Mathematics Research" (NSF-DMS 1636610).

AWM-MAA Mathematics Education Panel

Jackie Dewar and Pao-sheng Hsu, Co-chairs, AWM Education Committee

The AWM Education Committee and the MAA Committee on the Mathematical Education of Teachers (COMET) co-sponsored the panel "Highlighting Contributions to Mathematics Education from Members of Departments of Mathematical Sciences" at JMM 2017. The panel continued the conversation about work in mathematics education that was initiated at JMM 2016* by a similar panel, co-sponsored by the AWM and AMS Committees on Education.

The panel, which took place on January 6, 2017 in Atlanta, GA, was co-organized by Beth Burroughs, chair of COMET and a member of the AWM Education Committee, and Jackie Dewar and Pao-sheng Hsu, co-chairs of the AWM Education Committee. Robert Klein, a member of COMET and Associate Professor and Undergraduate Chair of Mathematics, Ohio University, moderated the panel.

Four panelists (listed below) discussed their work in mathematics education and provided summary highlights from their remarks. After the panelists' presentations, the audience of about two dozen and the panelists engaged in an extended discussion, primarily focused on how this work is evaluated and valued at various institutions.

Viveka Brown (Assistant Professor, Spelman College)

- Exposure is important for students. Introducing students to all fields that relate to mathematics and the research they entail is essential. This allows for their continued success in mathematics and mathematics education.
- Communication and dialogue between math departments and education departments are also important. Both departments are needed for the success of students since both content and pedagogy are significant.
- Research areas in mathematics education. Researching equity issues in mathematics must continue in order to increase the number of women and minorities in mathematics. Examining this issue from an anti-deficit

* While preparations were underway for the 2016 panel, the idea came up to have a volume in the AWM Springer series on mathematics education. The result, *Mathematics Education: A Spectrum of Work in Mathematical Sciences Departments*, co-edited by Jackie Dewar, Pao-sheng Hsu, and Harriet Pollatsek, has just appeared as Volume 7 in Springer's Association for Women in Mathematics Series. See http://www.springer.com/us/book/9783319449494

model is useful for encouraging underrepresented populations to consider a career in mathematics.

LouAnn Lovin (Professor of Mathematics Education, James Madison University)

- K–8 mathematics is not elementary. Unfortunately, there can be a perception that "anyone" can effectively teach the mathematics courses for elementary/middle school teachers "because the courses are so 'elementary' and involve basic ideas." Even mathematics educators who have focused more on the secondary level often have not developed the kind of specialized content knowledge needed to teach these particular courses well.
- If you are considering taking a tenure-track position within a mathematics department and are interested in doing research in mathematics education, make sure you ask and understand how you will be evaluated for promotion and tenure. Ask others in the field of mathematics education for recommendations of mathematics departments that support the kind of research and activity you are interested in doing.
- Mathematicians and mathematics educators can productively co-exist in the same department! In order to have a supportive work environment, faculty may not always agree, but they can still have intellectually stimulating discussions that are conducted in a respectful manner when all parties are open to the possibilities of learning something new or considering issues from a different perspective.

Megan Wawro (Associate Professor, Virginia Tech)

Mathematics departments can be a rich environment for undergraduate mathematics education researchers to find synergy in their research, teaching, and service. Examples of possible avenues for integration include:

- collaborating with mathematicians on studying student understanding in their courses; being a department resource for colleagues who are interested in learning student-centered instructional techniques;
- using research on student thinking and pedagogy to inform curriculum design for courses in your department;
- or serving on committees that would be natural consumers of undergraduate mathematics education research findings (such as characteristics of successful pre-calculus or calculus programs, models of effective graduate teaching assistant training programs, techniques and professional development suggestions for student-centered pedagogy, or suggestions for what to teach and when in a course based on how students learn and understand particular content ideas).

Panelists: LouAnn Lovin, Megan Wawro, Viveka Brown, Nina White; Moderator: Robert Klein

Nina White (Assistant Research Scientist and Lecturer, University of Michigan)

For those thinking of making a transition from mathematics to mathematics education:

- Seek out different and diverse experiences. It's important to know what you do and don't like. Are you most interested in teaching? Doing research? Developing curriculum? Working with in-service teachers? Pre-service teachers? You may have an idea of what you want to do, but until you've gained some hands on experience, you won't know what's the best fit for you.
- Seek out mentors. I benefited immensely from mentors as I transitioned from mathematics to math education. Some of my mentors I saw only once per year, some I saw weekly. They were important for me in learning the diverse terrain of math education. They helped me figure out what I needed to learn and what kind of professional role I wanted to eventually have.
- Be humble: there is a lot you don't know. There is much to learn about the "education" side of math education, but also the mathematical side, even for a trained mathematician. Math education is its own kind of applied mathematics and has its own specialized content knowledge.
- Seek out professional communities, e.g. RUME, AMTE, SIGMAAs. This is a great way to learn about the discipline and meet both peers and mentors.

Many of the audience questions during the discussion at the end of the panel were about departmental dynamics in mathematics departments for math educators, including policies of tenure and promotion. This may be a topic worthy of further exploration at the next JMM.

AWM AT THE ATLANTA JMM

AWM AT THE ATLANTA JMM

STUDENT CHAPTER CORNER

Coordinator: Kavita Ramanan, kavita.ramanan@brown.edu

The Hood College student chapter celebrated MLK Day—and the beginning of spring semester—by going to see "Hidden Figures." We laughed, we cried, we cheered, we loved it. ***Betty Mayfield***

WINRS Conference

Stephanie Dodson, AWM Student Chapter President, Brown University

Join us for a one-day research symposium featuring a series of research talks, a panel on effective mentoring, a poster session, and a variety of mathematical tutorials in cryptology, data science and other areas. The Women's Intellectual Network Research Symposium: New England, "A Meeting of Math Minds," will be held Saturday, March 4, 2017 at Brown University, Providence, RI. Plenary speakers will be Professors Mary Lou Zeeman, Bowdoin College, and Moon Duchin, Tufts University. The conference will also serve as a regional New England meeting of the AWM Student Chapters.

The conference objective is to introduce students, postdocs, and faculty, in particular women, to ongoing research in New England and bridge gaps between universities. We aim to connect researchers in similar mathematical fields, as well as promote collaboration and share strategies for addressing issues facing women and other underrepresented groups in math. The conference is open to everyone, regardless of gender identity. Input on the scientific organization of the conference has been provided by a variety of AWM student chapter members in New England including Siddhi Krishna, Boston College, and Victoria Day, UMass Amherst.

Mathematicians of all levels are invited to submit abstracts for 15 minute talks, electronic posters, and traditional posters. Full conference information, abstract submission, and registration can be found at: http://www.dam.brown.edu/people/aah/WINRS/index.html

The Local Organizing Committee of WINRS, New England: A Meeting of Math Minds is: Stephanie Dodson, Amanda Howard, Karen Larson and Anna Lischke, graduate students, Brown University; and Kavita Ramanan, Professor of Applied Math, Brown University.

Smoke without Fire and Oceans without Water

AWM Student Chapter, Brown University

In the 2016 fall semester, the AWM Student Chapter at Brown University hosted two events that focused on mathematics in animation. In the first event, participants followed a tutorial to design their own video games with the program Stencyl [1]. The program highlights physical aspects of video games, such as gravity, and uses a drag and drop interface to code advanced commands. In the second event, the chapter learned how smoke, water, and fire are modeled by discrete particle interactions with smoothed particle hydrodynamics. Different force kernels, viscosities, and elasticities affect the particle motion and provide the dynamics of the fluid. A smoothing effect is added to the particle simulations to supply the final animated texture. With the help of online tools [2], we explored the impact of viscosity and elasticity in the fluid models, and watched clips of the particle simulations and smoothing effects in action. These events engaged students and introduced additional applications of mathematics.

[1] Stencyl. (2016). Retrieved from: http://www.stencyl.com/

[2] Khan Academy. (2016, July 7). Introduction to Particle Simulations. Retrieved from: https://www.khanacademy.org/partner-content/pixar/effects/particle/v/effects-overview

AWM Hill Visit

Beth Malmskog and Madison Taylor, Villanova University
portions of the text also appeared in the AMS blog PhD + Epsilon; see http://blogs.ams.org/phdplus/2016/12/13/dc-or-bust-awm-and-villanova-visit-capitol-hill/

On December 1, AWM leaders, regional members, and Villanova University student chapter members traveled to Washington, DC to bring the organization's legislative agenda to Capitol Hill. As part of the AWM Hill Visits program, launched in 2015, AWM members from academia and industry worked with groups of students to visit with over twenty legislative offices during the day. Visiting legislators from the members' home states, as well as other legislators with connections to AWM members and priorities, the groups talked about issues affecting women in STEM and lobbied for support of several bills.

The top legislative priority was the Women and Minorities in STEM Booster Act of 2016, which would require the National Science Foundation to award competitive grants to activities that would increase participation of women and underrepresented minorities in STEM, and will need to be reintroduced in the new congress. AWM members also spoke in support of the Computer Science for All Initiative, the INSPIRE Women Act, directing NASA to support STEM initiatives for women and girls, and the Federal Funding Accountability for Sexual Harassers Act, which would amend the Higher Education Act to require that sexual harassment by Principal Investigators be reported to funding agencies, and that harassment reports be considered when awarding federal funding.

Pat Saulino, Katie Robbins, Rep. Leonard Lance (R, NJ)

First Row: Shantel Silva, Megan Donofrio, Kristin Lauter, Beth Malmskog, Evelyn Sander; Second Row: Madison Davis, Katie Robbins, Alexandra Golia, Madison Taylor, Ami Radunskaya, Betty Mayfield, Talitha Washington; Third Row: Tasha Boland, Pat Saulino, Kristen Austin, Karoline Pershell, Michelle Snider, Katie Haymaker, Adele Merritt

The groups met with several legislators from both the House and Senate. Drs. Michelle Snider and Adele Merritt, Villanova juniors Madison Taylor and Alexandra Golia, and many others met with Representative Jackie Speier (D, CA), sponsor of the Accountability Act. Snider and Taylor were joined by AWM President Kristin Lauter, AWM President-Elect Ami Radunskaya, and Villanova seniors Katie Robbins and Patrick Saulino for a meeting with Representative Leonard Lance (R, NJ). All nine Villanova students, Dr. Kathryn Haymaker, and the AWM leaders all met with Senator Robert Casey (D, PA) for a constituent coffee. Haymaker and Dr. Beth Malmskog met with Representative Dwight Evans (D, PA). Many other meetings were held with legislators' education and science/research specialists, including staff working for Tim Kaine, Richard Durbin, Elizabeth Warren, and Al Franken. The offices of Representatives Pat Meehan (R, PA) and Charles Dent (R, PA) also agreed to meet with AWM members Dr. Betty Mayfield, Haymaker, and Malmskog and expressed interest in the AWM priorities. Overall, many offices were supportive of the legislation and expressed their interest in meeting with students in particular.

continued on page 24

AWM HILL VISIT *continued from page 23*

The students came away with a sense of hope for the future of women in mathematics. Katie Robbins said, "It was a privilege to attend this trip and meet both non-student members of AWM as well as individuals from Capitol Hill. I felt as though our advocacy was well received by those we spoke with, and I am hopeful for the future of women in STEM fields." Villanova junior Shantel Silva said, "Sometimes it feels as though there is a big disconnect between the nation's government and its constituents; spending a day on the Hill gave me a little bit of hope that as citizens, we do have the possibility to affect what happens on the Hill." Non-student mathematicians were also inspired. Snider said that meeting with Representative Speier in particular "gave me so much hope, meeting women who are in positions of power who feel strongly about fighting for our rights."

The students were also happy to have the opportunity to form strong connections with women mathematicians in both academia and industry. "It was wonderful to be able to meet women who have been successful in their mathematics careers and learn from their experiences," according to Villanova junior Tasha Boland. Boland and Silva's group included sophomore Madison Davis, Dr. Evelyn Sander, and Dr. Karoline Pershell. Pershell's experience as a former AMS/AAAS Science and Technology Policy Fellow was very valuable as the group worked to plan and carry out the most effective visit possible. Drs. Gail Letzter, Karen Saxe, and Julie Sutton, members of the AWM Policy and Advocacy Committee, were also instrumental in organizing this visit and the larger AWM Hill Visits program.

Katie Haymaker, Rep. Dwight Evans (D, PA), Beth Malmskog

Villanova freshman Megan Donofrio was appreciative of the experience as it allowed her "to speak with Members of Congress about my background and passion for math and other STEM fields." Donofrio and fellow freshman Kristen Austin teamed with Dr. Talitha Washington to meet with several congressional offices. "It was a wonderful experience to spend a day with such strong female mathematician role models and fight for something I am so passionate about. This is definitely an experience I will never forget," Austin said.

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 (http://www.awm-math.org/travelgrants.html) for details on eligibility and do not hesitate to contact Jennifer Lewis at 703-934-0163, ext. 213 for guidance.

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

AWM Workshop at the 2018 Joint Mathematics Meetings

Application deadline for graduate students: August 15, 2017

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. New in 2016 and going forward is that 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 San Diego, California January 10–13, 2018.

FORMAT: The workshop will consist of a **Special Session** focused on **Noncommutative Algebra and Representation Theory** organized by Anne Shepler and Sarah Witherspoon, and a **Poster Session** for graduate students. Selected junior and senior women from the Research Collaboration Conferences for Women (RCCW) WINART, which was held at BIRS in April 2016, will be invited to give 20-minutes talks in the Special Session on Noncommutative Algebra and Representation Theory. 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 and graduate students working in areas related to Noncommutative Algebra and Representation Theory 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 Noncommutative Algebra and Representation Theory will have the opportunity to connect with the Women in Noncommutative Algebra and Representation Theory (WINART) Research Network.

All mathematicians (female and male) 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 workshop participants, in particular the graduate students. If you are interested in volunteering, please contact the AWM office at awm@awm-math.org by **September 15, 2017**.

ELIGIBILITY: To be eligible for selection and funding, a graduate student must have made substantial progress towards her thesis. 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 her thesis advisor.

Applications (including abstract submission via the Joint Mathematics Meetings website) must be completed electronically by **August 15, 2017**. See https://sites.google.com/site/awmmath/programs/workshops for details.

MEDIA COLUMN

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

Hidden Figures Video Contest Site

Sarah J. Greenwald

As I'm writing this, the movie *Hidden Figures* has been number one at the box office for the last two weekends. Marge Murray will be reviewing the book and movie in an upcoming issue, so we'll hear more about them from her. Also in the media is the recent announcement of winners for "The Search for Hidden Figures," a video contest sponsored by PepsiCo and 21st Century Fox (http://searchforhiddenfigures.com/the-search-for-hidden-figures/).

The contest was open to any "female identifying residents of the US," and 7000 people applied. There were two grand prize winners and ten runners-up. The most mathematical winners were runners-up Jami Mulgrave, a graduate student working on her PhD in statistics at North Carolina State University, who sings a song about statistics and discusses why statistics is important to her, and Rona Wang, a freshman at MIT studying mathematics and computer science. Wang talks about how she had to work for a summer to be able to save up enough money to take linear algebra at a local university once she had exhausted the courses at her high school. She began Code Fighters to expose low-income students to coding. They each won $10,000 to put toward education or research.

The contest site also has four interactive STEM games (http://searchforhiddenfigures.com/stem-challenges/). The most mathematical of the bunch, I guess, is the Rocket Launch Mission. I like the description accompanying it: "Mathematics is used to determine how artificial and natural objects move in the solar system. For example, astronauts use math to make precise calculations of the velocity and angle of their spacecraft as it travels through space." You choose a time to launch a rocket at the moving planet to try for a safe landing. At the end, you are invited to recalculate your trajectories, which was a cute way to encourage continued play, but I would have liked it better if they had shown some of the related mathematics—as it stands, it is hidden.

BOOK REVIEW

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

Women Don't Ask by Linda Babcock and Sara Laschever. Bantom Books, 2007. ISBN 978-0553383874

Reviewer: Joanna Slusky, University of Kansas

At 34, when I went on the faculty job market, I was optimistically anticipating my first real salary negotiation. In preparation for this momentous occasion I read *Women Don't Ask* by Linda Babcock and Sara Laschever.

This book deftly and thoroughly documents the gender differences in negotiation. The authors take a comprehensive approach to illustrating all the problems that disproportionately affect women in negotiations. The book discusses styles of negotiation and characteristics that lead to better negotiation, such as: importance of seeing situations as negotiable, the effects of satisfaction on negotiation outcomes, objective based negotiation versus position based negotiation (discussed later in this review), and how optimism and confidence are correlated with better negotiation results. For each of these topics, the authors discuss how women have been socialized to approach negotiation differently to how men approach negotiation and what the consequences of those different approaches are. The book also deals explicitly with how women are treated differently when they do negotiate, with chapters devoted to the tougher stances people take when negotiating with women and how women can be socially punished for negotiating in aggressive ways that are permitted to men. Although sometimes disheartening, the authors are full of helpful advice and optimism that although systemic changes are slow, women can improve the outcomes of their negotiations.

Women Don't Ask walks a fine line between academic work and self-help. This makes it a particularly pleasant read for an academic. Both of the authors teach and write about negotiation: Dr. Babcock in academe and Ms. Laschever in the popular press. Each chapter is full of vignettes about their students or interviewees whose troubles with negotiation

illustrate the themes of the chapter. Though the vignettes might strike the academic reader as somewhat hokey, interspersed with the vignettes are descriptions of academic studies that tease out the particular differences between women and men in all aspects of negotiation. These studies lead to extensive footnoting for a book of this genre, with between 26 and 90 references per chapter, most of which are from peer-reviewed studies in psychology, sociology, or organizational and behavioral science. The citation-heavy and data-driven analysis makes the points discussed by the authors all the more convincing.

Reading this book was certainly helpful in my ultimate job negotiations. I learned that before I started my negotiations I should carefully research what other junior faculty at the university were earning so that I could set appropriate goals for my own negotiation. Through the lens of the book I learned to see the negotiation as a way for me to convey my priorities to my future department chair instead of seeing the negotiation as a zero sum game for procuring more resources for myself. This form of negotiation was likely more effective and made me less reluctant to engage in negotiation which I was otherwise worried would jeopardize my nascent relationship with my chair. Reading *Women Don't Ask* also made me a more confident and optimistic negotiator, a mindset which the authors argue leads to better negotiation outcomes.

However, I wished I had read it earlier. *Women Don't Ask* made me more aware of previous missed opportunities where I might have asked for improvements that would have softened a negative work environment instead of choosing to leave. I reevaluated my previous salaries and stipends. I remember that I negotiated my first graduate stipend when I was 22. But, despite my early negotiation success, I genuinely believed that the salary and conditions of my work in my later years in graduate school were immutably fixed. And I continued to believe in the fixedness of my stipend despite knowing faculty who routinely gave larger stipends to the men in their labs if the men were supporting families. I also thought of my postdoc stipends as set in stone. After reading *Women Don't Ask* I wondered, "How did I not think of my salary as negotiable despite all the evidence to the contrary?"

I also saw missed opportunities in my private life where I could have been clearer about what I needed from friends or family and that I might have been better understood and better accommodated as a result. This book helped me see that everything including salary was up for negotiation and that negotiation didn't have to be antagonistic. A primary thesis in this book is that women are socialized to be better at negotiations that are about discussing each party's objective and finding solutions that address those objectives. This is considered objective based negotiation and is described in contrast to position based negotiation where each party argues for one position and the negotiation is only conducted along one axis of possibilities.

Now that I'm a faculty member who hires and manages personnel for my lab, I use the lessons from *Women Don't Ask* on a weekly basis. My goal is to maintain a happy and productive lab. So I am now experiencing from the other side how important it is to know what it is that each employee wants. I work to identify which members of my lab are not likely to see things as changeable. From *Women Don't Ask* I know that those who don't see things as changeable are less likely to ask me to fix things that make them unhappy. Knowing that encourages me to check in with them more frequently on a broader variety of issues. Better negotiation techniques means that I work on being more aware of what are and aren't priorities for my trainees so that I can distribute benefits appropriately. I also explicitly mentor my trainees in negotiation so that they can be more satisfied with their jobs in the future.

I have recommended *Women Don't Ask* to many friends, especially those in STEM fields. One of the more dispiriting conclusions that the authors arrive at is that the more male-dominated a field or a workplace, the worse women will fare in their negotiations. Although the authors are usually full of helpful suggestions, the best that they can offer for this setback is that women should try to find work in more female dominated fields, more female dominated companies within male dominated fields, or try to hire more women. These suggestions will be cold comfort to many academics who have little power to choose precisely where they work and where the options they do have will be universally male dominated for the foreseeable future. Perhaps this review will encourage more women in STEM to read this book and be more successful because of it. Ultimately, like the authors, I choose to be hopeful that better negotiations may be one small step in lessening the gender disparities in our workplaces.

So, would you please read this book? I've learned that it couldn't hurt to ask.

EDUCATION COLUMN

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

Outreach Extending to Africa

Suzanne Lenhart, University of Tennessee,
lenhart@math.utk.edu

In this column, we have frequently showcased various outreach programs for middle and high school students in the US. Recently, I have made several trips to Africa related to outreach and research collaboration. I want to tell you about a few programs that connect with research and education in Africa. My own African experiences have involved tutorials with graduate students and research collaborative workshops with students (undergraduate and graduate), postdocs, and faculty.

The Masamu Advanced Study Institute (MASI) and Research Workshop in Mathematical Sciences, held annually since 2011, is a program under the auspices of the Southern Africa Mathematical Sciences Association (SAMSA). Funded by a grant from the National Science Foundation (NSF), the Masamu Program (based at Auburn University with PI Overtoun Jenda) aims to enhance research in mathematical sciences by serving as a platform for US-Africa research collaboration. In order to effectively use the MASI and Research Workshops, the Masamu Program has created a Collaborative Research Network (CRN) consisting of 55 research faculty members forming 8 research teams in pure and applied mathematics. CRN teams work year-round on several research problems, as MASI continues to provide a venue for the constituents of the CRN to connect with undergraduate and graduate students and immerse themselves in intense group research activities for 10 days each year. To date, 121 individuals (70 students and 51 faculty members) from 13 countries have participated in the Masamu Program. In the last three years, I have been to Victoria Falls, Zimbabwe; Windhoek, Namibia; and Pretoria, South Africa with the Masamu program; my team has worked on a variety of models ranging from Ebola outbreaks with Sudan data to Buruli ulcers, a neglected disease in Ghana. But the research in this program involves various areas of mathematics: for example, the energetic graph theory group has a mixture of undergraduate and graduate students, postdocs, and faculty, led by the amazingly creative Pete Johnson of Auburn University. The next MASI and Workshop, to be held in November 2017, will be hosted by the University of Dar es Salaam in Tanzania. The 2018 and 2019 MASI and Workshops are scheduled to be held in the countries of Botswana and Malawi, respectively.

This past November, a STEM workshop was held at the SAMSA annual conference in conjunction with the Masamu program. Hearing about Saturday math workshops for middle school students in Zimbabwe and other nearby countries was fascinating. Math enrichment and engagement activities are needed almost everywhere! Masamu is planning for a bigger STEM workshop in Arusha, Tanzania, in November 2017.

In the past decade, with support from the NSF in three separate grants, the Center for Discrete Mathematics and Theoretical Computer Science (DIMACS) at Rutgers University organized US-Africa capacity-building programs aimed at

Participants in the 2016 Masamu Advanced Study Institute (MASI) and Research Workshop, Pretoria, South Africa

introducing students and junior researchers to the usefulness of mathematical sciences, enhancing collaborations, and forging ties between young people and established researchers in both the US and Africa. The themes of this activity, led by Fred Roberts, were organized around mathematics and biology and featured topics such as the spread and effective control of emerging and re-emerging diseases, "economic epidemiology," conservation biology, genetics and disease control, and landscape ecology and sustainable environments.

DIMACS' initial workshops led to a major US-African BioMathematics Initiative, a much more elaborate program that lasted multiple years and featured a series of Advanced Study Institutes, workshops, and visiting opportunities for African students and faculty to research centers in the US. The project was run by DIMACS in collaboration with the Mathematical Biosciences Institute at Ohio State University (MBI). The project also collaborated with several African mathematical organizations. In 2007, I was privileged to have taught a tutorial to graduate students on optimal control at the African Institute for Mathematical Sciences near Capetown, South Africa, as a part of this program. Two of the African graduate students at that tutorial (Folashade Agusto and Gesham Magombedze) later came as postdocs to the National Institute for Mathematical and Biological Synthesis at the University of Tennessee.

The DIMACS US-African Biomathematics Initiative was a pioneering project with aims that included identifying key challenges arising from the problems of Africa, creating long-lasting partnerships between US and African mathematical scientists, and training junior researchers to work in the field of biomathematics. Most of the project's activities took place in Africa, providing US researchers direct access to African researchers and uniquely African data, and introducing US students to African students, creating long-term partnerships and long-term commitment to international collaborations for US students.

The recent Ebola outbreak in West Africa was a reminder that the world is ill-prepared for a severe disease epidemic or any similar global sustained public emergency. The risk of future global severe infectious disease outbreaks in an increasingly connected world is greater than ever. In March 2016, at the request of NSF, DIMACS organized a workshop in Dakar, Senegal, devoted to examining how past severe disease outbreaks were contained while reviewing the world's response to these epidemics. It explored how mathematical models could be used to understand and forecast disease transmission dynamics and to evaluate the effect of different interventions and changing on-the-ground conditions on epidemiological outcomes. The workshop originally sought to concentrate on the responses to the recent Ebola outbreak, while gaining insight from responses to HIV/AIDS and other epidemics within individual countries. However, during the workshop, the Zika virus outbreak "hit the headlines" and became an important sub-theme of the workshop. To enhance local engagement, a mini-symposium at the University Cheikh Anta Diop of Dakar was also organized.

Masamu participants, research group presentation, 2016

The Ebola workshop was a satellite to the Next Einstein Forum (NEF), a major event featuring science ministers and even two heads of state, and celebrating the development of science and education throughout Africa. Over 1000 people participated, and plans are under way for DIMACS to follow up the NEF activity with further programs in Africa.

Padmanabhan (Padhu) Seshaiyer, who was one of the faculty members in the AWM Teacher Partnership program, currently serves as an adjunct faculty member at the Nelson Mandela African Institute for Science and Technology (NM-AIST) in Arusha, Tanzania. Over the last five years, he has been actively involved with the institution in developing research, teaching and STEM educational outreach programs and initiatives. To excite the next generation about STEM, Padhu worked with NM-AIST to create the first Nelson Mandela STEM Festival in July 2015 for the region. This event attracted nearly 1000 K–12 students, classroom teachers, university faculty, undergraduate and graduate students, parents and members from the industry and government in Tanzania. He is currently working with members from the Ministry in Dar es Salaam and Zanzibar to organize a STEM festival in Summer 2017.

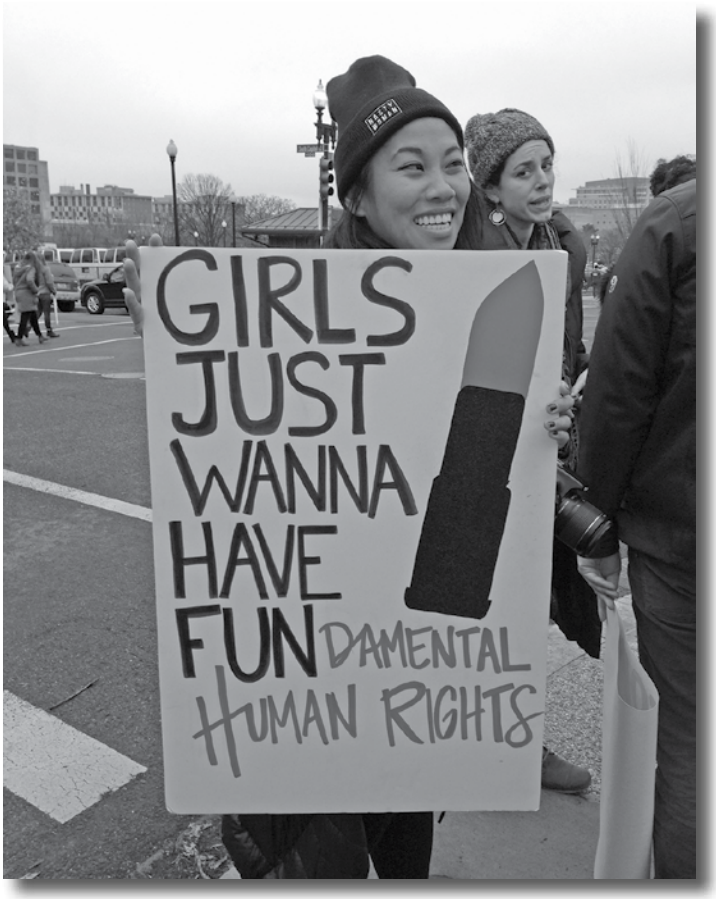
I have thoroughly enjoyed my participations in such activities, and frequently on these trips I also enjoyed seeing some African wildlife. Look for upcoming opportunities to participate in workshops in Africa organized by these groups and by others!

Acknowledgment: I want to thank Kelly Sturner, Overtoun Jenda, Fred Roberts and Padmanabhan Seshaiyer for providing material for this article.

Science and the Women's March

Sarah Greenwald, Gregory Rhoads, and
Lynn Searfoss, Appalachian State University

On January 21st, a huge chorus of voices arose at the Women's March on Washington, DC and in sister marches around the world. We were lucky to attend the Washington march, where the streets of DC were flooded with people everywhere we turned. The size and energy of the crowd felt great. Crowd estimates are complicated, but aerial images of the nation's capital show hundreds of thousands of people, well in excess of the number originally predicted. Particularly encouraging was the tremendous diversity of the marchers with respect to age, race, ethnicity, religion, and gender identity. You might expect that there were a number of academic and student marchers, and there were. The American Association of University Women (AAUW) was represented on large buttons made specifically for the march. At the same time, many of the people we saw and spoke with were not attached to academia. From its inception, the women's march was to support equality, and we found it especially encouraging to see so many young women and allies participating in the march.



Signs, buttons, and chants showed the thoughtfulness, creativity, and effort of their creators. Of this welter of ideas, we found many that we thought AWM members would be interested in. Coinciding with the theme of equality was the chant "ERA, ERA, equal rights and equal pay!" Many posters made us laugh even as they provoked thought: "Didn't I march for this years ago?" One of our favorite posters read: "I am eternally grateful to the women before me who fought for my rights. I march for the girls who come after me." One of the most encouraging aspects of the march was that, while the general tone of the event highlighted the importance of women's rights, there was plenty of evidence that the crowds embrace the importance of science. For example, one slogan was "Pro Science and Proud." Another proclaimed: "What do we want? Evidence based science. When do we want it? After peer review." One surprising sign featured the names of prominent women scientists and mathematicians! The organizers hope that the effort and concerns expressed in the march will be sustained: "This is more than just a single day of action. This is the beginning of a movement to protect, defend and advance human rights." And, in many ways, those rights and our well-being depend upon science and other valid, fact-based forms of research. From what we witnessed, we have every reason to be optimistic. The enthusiasm and passion of the marchers, and particularly of the young people, will continue; and they will continue to demand more facts to support the informed actions upon which our lives depend.

AWM Research Symposium 2017

AWM Research Symposium 2017 will be held at the University of California Los Angeles (UCLA), April 8–9, 2017. The symposium will showcase the research of women in the mathematical professions. It will feature four plenary talks, special sessions on a broad range of research in pure and applied mathematics, and poster sessions for graduate students and recent PhDs. Eight of the special sessions will be organized by the Research Networks supported by the NSF AWM ADVANCE grant. The Institute for Pure and Applied Mathematics (IPAM) will host an event especially for students on the evening of April 7, featuring director Sarah Moshman of The Empowerment Project. Announcements about some of the events appear below. See www.awm-math.org for further information.

Special Session in Research on Undergraduate Mathematics Education

Organizers: Shandy Hauk & Pao-sheng Hsu

AWM Research Symposium 2017 will include a special session on research in collegiate mathematics education. Specifically designed for people who have advanced degrees in the mathematical sciences, session activities will touch on what research suggests about thinking and learning across the college curriculum—from college algebra to calculus, combinatorics, proof, and more. Speakers will communicate the landscape of current research in undergraduate mathematics education as well as offer useful information for present and future faculty members. The goal is to generate lively conversations about the foundations and implications of collegiate mathematics education research.

Wikipedia Edit-a-thon

Ursula Whitcher

Wikipedia is a free, community-created source of information, but the vast majority of Wikipedia's volunteer "editors" are men (survey estimates put women at 8.5%–16% of the editor pool). Inevitably, the content on Wikipedia reflects unconscious bias. Join us at the AWM Symposium to add content about women in mathematics to Wikipedia! We'll have coffee, internet access, and experienced Wikipedians who can help you start editing. We'll also chat about ways to teach using Wikipedia. Marie Vitulli, creator of the award-winning Women in Math Project (http://pages.uoregon.edu/wmnmath/) and a past Falconer Lecturer, will be a special guest.

Want to start early? Here are some things you can do now:

- Join the AWM Wikipedia Google Group to get updates or share ideas for articles: https://groups.google.com/forum/#!forum/awm-wiki. If you won't be attending the symposium in person, you're still welcome to join and brainstorm with us.
- Create an account on Wikipedia: https://en.wikipedia.org/wiki/Special:CreateAccount
- Check out the Women in Red list of mathematicians who need Wikipedia profiles: https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Women_in_Red/Mathematics
- You can add women to the list yourself using the "edit" tab, post ideas for profiles to our Google group, or email uaw@umich.edu with suggestions.

First-ever Special Session in History of Mathematics at AWM Symposium

Organizer: Janet Beery

The AWM Research Symposium will include for the first time ever a special session on research in the history of mathematics. Invited speakers at various stages in their careers will share their latest research on the history of mathematics during the last two centuries. At least four of the eight speakers will specifically address the history of women in mathematics; others will touch upon it as they focus on other aspects of the development of mathematics. Talks will be interesting and accessible to all mathematicians, from students to seasoned professionals.

ADVERTISEMENTS

CALL FOR NOMINATIONS FOR THE OSTROWSKI PRIZE 2017—The aim of the Ostrowski Foundation is to promote the mathematical sciences. Every second year it provides a prize for recent outstanding achievements in pure mathematics and in the foundations of numerical mathematics. The value of the prize for 2017 is 100.000 Swiss francs. The prize has been awarded every two years since 1989. The most recent winners are Ben Green and Terence Tao in 2005, Oded Schramm in 2007, Sorin Popa in 2009, Ib Madsen, David Preiss and Kannan Soundararajan in 2011, Yitang Zhang in 2013, and Peter Scholze in 2015. See https://www.ostrowski.ch/index e.php for the complete list and further details. The jury invites nominations for candidates for the 2017 Ostrowski Prize. Nominations should include a CV of the candidate, a letter of nomination and 2-3 letters of reference. The Chair of the jury for 2017 is Gil Kalai of the Hebrew University of Jerusalem, Israel. Nominations should be sent to kalai@math.huji.ac.il by **May 15, 2017**.

INSTITUTE FOR DEFENSE ANALYSES—The Institute for Defense Analyses Center for Communications Research—Princeton (IDA/CCR-P) is looking for individuals in mathematics, computer science, electrical engineering, and related fields to join in exciting research that enhances our nation's security along with our sponsor, the National Security Agency. Individuals that thrive here enjoy solving difficult problems with a wide range of tools, from mathematics, statistics, computational science, and engineering. Rather than recruiting specific specialties, we are looking for smart PhDs who are willing to learn whatever it takes to solve our ever evolving research problems. Some problems require very deep and sophisticated mathematics, others the latest computational and other technologies, and many problems require both. Ours is a superior professional working environment emphasizing cooperative effort. We are located in Princeton, NJ and benefit from the exciting intellectual environment of our immediate area, as well as the benefits of being close to both New York and Philadelphia. U.S. citizenship and a Department of Defense TS//SI clearance (with polygraph) are required. IDA/CCR-P will sponsor this clearance for those selected. IDA/CCR-Princeton is an equal opportunity employer committed to providing a working environment that is free from discrimination on the basis of race, color, religion, sex (including pregnancy and gender identity), sexual orientation, national origin, age, disability, status as a protected veteran, marital status, genetic characteristic or any other legally protected condition or characteristic. Interested individuals should contact Dr. David J. Saltman (Director) at saltman@idaccr.org with a C.V. and a list of references, and they should apply to this announcement at: https://chk.tbe.taleo.net/chk01/ats/careers/v2/viewRequisition?org=INSTITUTEDA&cws=39&rid=695

2017–2018 Individual Membership Form

JOIN ONLINE at www.awm-math.org!

ASSOCIATION FOR WOMEN IN MATHEMATICS

11240 Waples Mill Road
Suite 200
Fairfax, VA 22030
(703) 934-0163
http://www.awm-math.org
awm@awm-math.org

LAST NAME _____ FIRST NAME _____ M.I. _____

ADDRESS _____

CITY _____ STATE/PROVINCE _____

ZIP/POSTAL CODE _____ COUNTRY _____

AWM's membership year is from October 1 to September 30. Please fill in this information and return it along with your DUES to: AWM Membership, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030.

The AWM *Newsletter* is published six times a year. If you have questions, contact AWM at awm@awm-math.org, (703)934-0163, or visit our website at: http://www.awm-math.org.

☐ I **do not** want my AWM membership information to be released for the Combined Membership List.

E-mail: _____ Home Phone: _____ Work Phone: _____

PROFESSIONAL INFORMATION:

Position: _____

Institution/Company: _____

If student, check one:
☐ Graduate ☐ Undergraduate
If not employed, leave position and institution blank.

City: _____ State/Province: _____ Zip/Postal Code: _____ Country: _____

DEGREES EARNED:

	Degree(s)	Institution(s)	Year(s)
Doctorate:			
Master's:			
Bachelor's:			

Individual Dues Schedule

Please check the appropriate membership category below. Make checks or money order payable to: Association for Women in Mathematics.
NOTE: All checks must be drawn on U.S. banks and be in U.S. funds. AWM membership year is October 1 to September 30.

☐ REGULAR INDIVIDUAL MEMBERSHIP (New Members ONLY).	$ 30	_____
☐ REGULAR INDIVIDUAL MEMBERSHIP.	$ 65	_____
☐ 2ND FAMILY MEMBERSHIP.	$ 30	_____
Please indicate regular family member: _____		
☐ CONTRIBUTING MEMBERSHIP (includes designation of a free student membership)	$150	_____
☐ RETIRED or PART-TIME EMPLOYED MEMBERSHIP or KWMS AFFILIATE *(circle one)*	$ 30	_____
☐ STUDENT or UNEMPLOYED MEMBERSHIP *(circle one)*	$ 20	_____
☐ OUTREACH MEMBERSHIP	$ 10	_____
☐ CONTRIBUTION to the AWM ANNUAL GIVING CAMPAIGN.	$	_____
☐ CONTRIBUTION to the AWM ALICE T. SCHAFER PRIZE FUND	$	_____
☐ CONTRIBUTION to the AWM ANNIVERSARY ENDOWMENT FUND	$	_____

☐ I **do not** want my name to appear in annual lists of contributors to AWM's funds.

Select preferred newsletter delivery method: ☐ Print ☐ Electronic

Please note that all Student, Unemployed, Outreach, Family, and KWMS Affiliate members and members with non-U.S. addresses receive only the electronic version of the newsletter.

☐ Gift membership from: _____

TOTAL ENCLOSED $ _____

AWM
11240 Waples Mill Road
Suite 200
Fairfax, VA 22030

NON-PROFIT ORG.
U.S. POSTAGE
PAID
WASHINGTON, D.C.
PERMIT No. 827

Printed in the U.S.A.

ASSOCIATION FOR WOMEN IN MATHEMATICS

Volume 47, Number 2, March–April 2017

ADDRESS CORRECTION FORM

☐ Please change my address to:
☐ Please send membership information to my colleague listed below:
☐ No forwarding address known for the individual listed below (enclose copy of label):
(Please print)

Name _____

Address _____

City _____ State _____ Zip _____

Country (if not U.S.) _____ E-mail Address _____

Position _____ Institution/Org. _____

Telephone: Home _____ Work _____

☐ I **DO NOT** want my AWM membership information to be released for the **Combined Membership List (CML)**.

MAIL TO:

AWM
11240 Waples Mill Road
Suite 200
Fairfax, VA 22030

or E-MAIL:

awm@awm-math.org