

MAA FOCUS

Newsmagazine of the Mathematical Association of America



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From the Editor



Phew. The semester is wrapping up (YAY!) and I'm getting summer projects in line (Boo!). What are your summer plans? Resting and recuperating? Teaching? Research? Finishing that paper that you put down at spring break and now needs to be proofread and submitted?

I'm focusing on administrative and curriculum development tasks this summer, including reading (parts of) the MAA CUPM Curriculum Guide and the MAA Instructional Practices Guide to learn more about well-accepted best practices in our field as Lamar University (and many of the colleges and universities in Texas) embark upon co-requisite and pathway course development. The GAISE document is also on my reading list, as are several books about pedagogy (flipped learning, active lecturing, developmental education and general learning theory). I'm looking forward to reading those over coffee without having to rush off to teach a class, and I'm looking forward to sharing ideas about these courses (and hear what others have done) at MAA MathFest this summer in Denver (August 1–4).

Whatever your summer plans are (and I hope most of you are planning some relaxation time—I'm interspersing reading Agatha Christie novels with the pedagogy reading mentioned above!), we hope that you'll be able to join us in Denver, too!

On the Cover



Sunrise over Denver, Colorado's skyline as seen from City Park.
Getty Images: Beklaus

MAA FOCUS

Mathematical Association of America

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Mentors Needed

We would like your help in identifying someone from your section who is interested in being a Mentorship Facilitator for both MAA Project NExT and the MAA Mentoring Network. A Mentorship Facilitator will work with a representative from MAA Project NExT and a representative from the MAA Committee on Early Career Mathematicians to pair each interested new faculty member in your MAA Section with a more senior faculty member at a separate institution within your MAA Section. Ideally, the institutions of the senior faculty mentors will mirror those of the junior faculty mentees (in size, affiliation, public/private, etc.) and be fairly close in proximity. Mentorship Facilitators will be provided with a list of interested new faculty members as well as volunteer mentors. However, in the case when there are not sufficient mentor volunteers, the Mentorship Facilitator will need to identify and recruit mentors. Therefore, a Mentorship Facilitator should be someone who is familiar with the schools in your MAA Section and who knows many of your active members.

If you have someone who is interested in helping and/or if you have any questions, please email Julie Barnes at jbarnes@email.wcu.edu.

Mathematically Gifted & Black

Mathematically Gifted and Black (mathematicallygiftedandblack.com/) recognizes the achievements of black scholars in the mathematical sciences. During Black History month (February), the website features 28 individuals who are mathematically gifted and black. MAA FOCUS editorial board member, Jacqueline Brannon Giles was recognized in 2017. A recent video (youtube.com/watch?v=UxxJ8LHlic) features Giles, in her own words, telling how she reaches out to students and engages them in mathematics.

Erica Graham, Raegan Higgins, Candice Price, Shelby Wilson, and Ernest Holmes are the founders of Mathematically Gifted & Black, paralleling Lathisms (lathisms.org/) which highlights Latin@s and Hispanics in the Mathematical Sciences.

New MAA Section Representatives

This spring, nine MAA Sections elected new Section Representatives to the MAA Congress. These representatives will serve three year terms beginning July 1, 2018. The Congress serves as a conduit for communication between the Board, the Sections, and other constituencies. We welcome the following members to their new role and encourage you to reach out to your Section Representative with questions or concerns.

Tim Chartier, *Southeastern Section*
Thomas Hagedorn, *New Jersey Section*
Chris Hallstrom, *Pacific Northwest Section*
Diane Lussier, *Southwestern Section*
Daniel Otero, *Ohio Section*
Jeffrey L Poet, *Missouri Section*
Charles Ragozzine, *Seaway Section*
Karen Stanish, *Northeastern Section*
Eric West, *Kansas Section*

Fall MAA Section Meetings

EASTERN PA & DELAWARE

November 3, West Chester University

IOWA

October 5–6, Morningside College

MARYLAND/DC/VIRGINIA

November 2–3, Mary Washington University

NEW JERSEY

October 27, Montclair State University

NORTH CENTRAL

October 12–13, Southwest Minnesota State University

OHIO

October 26–27, Malone University

SEAWAY

October 12–13, University of Toronto Mississauga

For the most up-to-date information on your section's activities go to maa.org/sections and click on the link for your section. ■

Found Math

David Bressoud
@dbressoud

Follow

David Scott at Puget Sound forwarded this incentive for organic blanched almond flour. This may be what we need to finally get someone to pay attention to this problem. [anthonysgoods.com/products/antho ...](http://anthonysgoods.com/products/antho...)



(<https://twitter.com/dbressoud/status/985536003401138176>)

Looking Forward to Denver

Michael Pearson, *Executive Director*

I recently spent a couple of days in Denver (on my own dime!) and stayed in the neighborhood where MAA MathFest will be held in just a few months. I was delighted to see the remarkably diverse options for spending time in the mile-high city.

Within a short walk from the Sheraton Downtown (the convention site), across a grand public plaza with the Colorado state capital on one end and the Denver city hall on the other, is the Denver Art Museum, where I took in a lovely exhibition on Edgar Degas (more on that later). Adjacent to the city hall is the Denver branch of the U.S. Mint, which offers daily tours.

The Sheraton is on one end of the 16th Street Mall, a (mostly) pedestrian strip with myriad dining, drinking, and shopping options. Denver is one of the fastest-growing cities in the country, and the downtown scene reflects the energetic and diverse population of this vibrant city. From local coffee shops to craft beers to locally-sourced food in a

variety of styles, you can find something to suit your tastes.

I chose to stay downtown specifically to go to a couple of shows at Dazzle, an outstanding jazz club a few blocks from the Sheraton. The live music scene in Denver is extremely active; it reminds me a bit of the Austin scene when I was in graduate school in the '80s. We managed to see several live acts in just two afternoons and evenings across a variety of venues.

Now back to that Degas exhibit. The curators did a good job of highlighting Degas' life-long quest to learn from other artists, develop new techniques in new formats (drawing, painting, printing, sculpting and photography), and in general to seek a deeper understanding of art and the human condition. I think that spirit is demonstrated by the MAA community, and I expect that spirit to be on full display when we gather in Denver this summer. The program will be rich and varied, and offer opportunities for all of us to share insights to contribute to the growth of mathematical professionals at all levels.

I look forward to visiting Denver again soon, and hope to see you there! Register now at bit.ly/2rNdJ10.

Tribute to Professors Leonard Klosinski and Gerald Alexanderson

The Trustees of the William Lowell Putnam Prize Fund for the Promotion of Scholarship wish to express our heartfelt thanks to Professor Leonard Klosinski and Professor Gerald Alexanderson for their excellent stewardship of the mathematical competition over more than four decades, from 1975 to 2017. Over that time, Professors Klosinski and Alexanderson have worked with three generations of trustees from the Putnam family, all of whom are very sorry that we are unable to attend today's event to express our thanks in person.

Under Klosinski's and Alexanderson's leadership, the number of competitors more than doubled from 2203 in 1975 to 4440 a couple of years ago. Moreover, the number of colleges represented grew from 355 to 568, a 60% increase. Despite this impressive growth, Leonard and Jerry have kept the competition running smoothly and maintained its position as the preeminent intercollegiate mathematical competition in North America, if not the world. If the administration of the competition had been a problem on a Putnam exam, Klosinski and Alexanderson would have received full marks for their efforts.

Thank you, Leonard and Jerry, for all that you have done for the competition. We are sure that Elizabeth and William

Lowell Putnam could not have imagined the success that the competition would achieve when they conceived the idea of an academic intercollegiate contest nearly a century ago. For the last 42 years that success has been due in a large part to your extraordinary efforts. Your ability to balance growth and innovation while maintaining the core ideals and high mathematical standards of the competition has set a standard that we will all strive to achieve as we look to the future.

George Putnam, Jr. (retired)
George Putnam, III
Warren Lowell Putnam

GET MORE

For more on the Putnam Competition go to www.maa.org/putnam. For more on the Alexanderson and Klosinski Putnam team go to bit.ly/2GxTRIS.

Father Michael E. Engh, S.J., Gerald Alexanderson, Leonard Klosinski, and Michael Pearson at the lunch honoring Jerry and Leonard.





The U.S. team took second place at the European Girls' Mathematical Olympiad (EGMO) held April 9–15, 2018, in Florence, Italy, against teams from 52 countries. In addition to second place team honors, each member of the four person team was awarded a medal for their individual performance on the challenging mathematics exam.

The European Girls' Mathematical Olympiad is an international mathematics competition for female high school students. This year's competition had 192 students. The U.S. team is organized by the MAA and has consistently placed in the top four teams with a first place team finish in 2017.

The 2018 EGMO U.S. team members are Megan Joshi (individual silver medal), Wanlin Li (individual gold medal), Emily Wen (individual bronze medal), and Catherine Wu (individual gold medal). Meghal Gupta served as team leader and Rachel Zhang as deputy leader.

The exam is made up of six proof-style problems given over two days. The U.S. team score was 129 out of a possible



Sherry Gong, Emily Wen, Catherine (Katie) Wu, Megan Joshi, Wanlin Li, Meghal Gupta, Rachel Zhang

168 points. Wu and returning U.S. team member Li were two of only five students to receive a perfect score of 42 points in the competition.

“The Mathematical Association of America is proud to sponsor the U.S. EGMO team as part of the MAA American Mathematics Competitions. On behalf of the mathematical community, we congratulate you on your second place finish in the European Girls' Mathematical Olympiad. Your extraordinary performance is an inspiring example of hard work for the next generation of young mathematicians,” said Jennifer Barton, MAA director of competition operations. “We celebrate your achievements and are proud that you are part of America's top math students.”

MAA Supports Grants for Industry Career Prep and Summer Research for Underrepresented Groups

The MAA announced funding for 42 colleges and universities as part of the MAA Preparation for Industrial Careers in Mathematical Sciences (PIC Math) program. The PIC Math program is supported by the National Science Foundation (DMS-1722275). As they tackle an industrial partner's real-world problem, students who participate in the PIC Math program learn problem solving, critical thinking, communication, and independent thinking skills that are valued by employers of STEM professionals. This program supports underrepresented groups in the mathematical sciences, as well as first-generation and low socio-economic status college students. The PIC Math program has served 131 campuses and more than 2,000 students since it first began in 2014.

The MAA also announced funding for 10 colleges and universities to offer a summer research experience with a stipend for students from historically underrepresented groups in mathematics as part of the Strengthening Underrepresented Minority Mathematics Achievement program. The National Research Experience for Undergraduates Program is supported by the National Science Foundation (DMS-1652506). NREUP is designed to reach minority students at a critical point in their career path—midway through their undergraduate programs.

For more information about the PIC Math program go to maa.org/picmath. Additional information on NREUP can be found at maa.org/nreup.

What's New in the MAA Pavilion at MAA MathFest?

Caricature Paintings

Wednesday, August 1, 6:00-7:00 PM

John dePillis will be crafting on-the-spot caricatures in one minute or less. Come by and get a personalized MathFest souvenir!

Meet the SIGMAA-Rec

Wednesday, August 1, 7:00-7:30 PM

Thursday, August 2, 2:30-3:00 PM

One of the new Special Interest Groups of the MAA is the SIGMAA on Recreational Mathematics. The aim of the SIGMAA on Recreational Mathematics (SIGMAA-Rec) is to bring together enthusiasts and researchers in the myriad of topics that fall under recreational math. We will share results and ideas from our work, show that real, deep mathematics is there awaiting those who look, and welcome those who wish to become involved in this branch of mathematics. If this sounds intriguing to you, if you are looking for new research avenues, if you want to enjoy some fun topics, or if you just want to talk to us to find out more, officers of the SIGMAA-Rec will be spending time at the MAA Pavilion during MathFest. Stop by to chat and see what we are about. We will enjoy getting a chance to meet you and hope you will join us for a fun activity. Hope to see you there!

MAA Journals: Connect, Engage, Publish

Thursday, August 2, 3:30-4:00 PM

Visit the MAA Pavilion to meet with the editors of the MAA journals. Discover valuable information about all the author resources available from MAA Press and Taylor & Francis. Connect with MAA journal editors face to face. Discover more about the MAA's partnership with Taylor & Francis and the high impact of global publishing. Transform

your mathematical results and ideas into great expository writing and submit it to one of the MAA's internationally read, peer-reviewed journals. Ignite your passion for publishing in the MAA journals.

MAA FOCUS: Sharing Great Ideas

Friday, August 3, 2:30-3:00 PM

MAA FOCUS is always looking for great expository articles in a variety of areas. Have a great teaching or research trick that you can summarize in about 800 words? That might be a great Teaching Toolkit item. Are you involved with a SIGMAA and want to share recent or planned activities? The SIGMAA Showcase is for you! Working on a new project that you wish to share with our members? If you can explain it in about 1600 words and have great photos, you might have a future feature article in mind! Come by the MAA Pavilion to discuss these ideas with the editor and members of the editorial board!

PosterFest and Early Career Networking

Friday, August 3, 3:00 PM (PosterFest)

Friday, August 3, 4:15 PM (Networking)

The MAA Committee on Early Career Mathematicians is once again sponsoring PosterFest, a networking event in the exhibit hall. All are welcome to meet and discuss the work of mathematicians and mathematics educators who are new to the MAA community. This year's PosterFest will be followed immediately by a reception and networking meet-up at the MAA Pavilion. There will be snacks and a chance to mingle and network with junior and senior mathematicians. Graduate students, early career mathematicians, and interested senior mathematicians are all welcome to both events.

Submission Deadlines for the Association for Women in Mathematics

Aug 15 Service Award

Recognizes individuals for promoting and supporting women in math through exceptional service to the AWM

Aug 15 JMM Poster Session

Juried student poster session to be held in conjunction with AWM Workshops

Sep 1 Falconer Lecture

Honors women who have made distinguished contributions to the mathematical science or mathematics education

Oct 1 Schafer Prize

Recognizes a woman undergraduate who

has demonstrated excellence in mathematics

Oct 1 Dissertation Prize

Honors outstanding dissertations by women mathematical scientists (defended within the past two years)

Oct 1 Travel Grant

Grant for women PhD mathematicians to attend meetings or conferences

Oct 15 Noether Lecture

Honors women who have made fundamental and sustained contributions to the mathematical sciences

Nov 1 Michler Prize

Honors outstanding women who have recently been promoted to Associate Professor as Research Fellows in the Cornell Mathematics Department

Nov 1 Kovalsky Lecture

Recognizes those in the scientific or engineering community whose work highlights the achievement of women in applied or computational mathematics

Nominations and applications should be submitted through MathPrograms at: www.mathprograms.org.

New MAA Associate Secretary – Hortensia Soto

—JACQUELINE JENSEN-VALLIN

We are excited to announce our new Associate Secretary, Hortensia Soto of the University of Northern Colorado. Soto will take office August 15, 2018, but has been shadowing current Associate Secretary, Gerard Venema, and has already begun helping plan events for MAA MathFest 2018 and the 2019 Joint Mathematics Meetings.

Soto is the first woman, the first Hispanic, and the first mathematics educator to serve the MAA in this role.

How did you first get involved with the MAA?

My involvement with the MAA began in 1996 as a Project NExT fellow. Jim Leitzel and T. Christine Stevens invited me to facilitate the follow-up sessions for our blue dots. I was surprised because there were so many fellows who I thought were so much better equipped than me and who had real pedigree—unlike me. I, of course, was also quite honored and to this day grateful for their faith in me.

You've been involved with MAA at a national level for more than 15 years. What made Associate Secretary an interesting position for you?

I first became involved with the MAA at the national level in 2002 when I was elected to serve as governor of our section (Rocky Mountain) and from there my involvement spiraled. Tina Straley and Martha Siegel took me under their wings and assigned me to committees, some of which I knew nothing about, but through all of these I met wonderful people. One of those people was Jim Daniel, who I consider my MAA dad; he has been one of my greatest cheerleaders and mentor. I also served as the MAA Minority Representative governor and the associate

treasurer. All of these roles have helped me to learn about the business side of the MAA and work closely with the MAA staff.

I wasn't really sure that applying for the associate secretary position was the right thing for me because of timing, but Michael Pearson kept asking me to apply and I kept saying no. Then one day I woke up and remembered a conversation with a friend who asked about my big professional goals. I thought it was a strange question and was surprised that without missing a beat I had an answer. My answer was, "I want to serve as a bridge between mathematicians and mathematics educators." That morning I realized that the MAA associate secretary role could serve as a vehicle to work on that goal. Also, I very much enjoy serving the MAA and working with the MAA staff is such a dream—they are so great! Finally, I like to take on tasks that scare me a bit and where I feel unsure of my abilities—such tasks help me grow.

The Associate Secretary of the MAA is "responsible for the scientific program at, and for the general planning of, the annual scientific meetings of the Association." Are there any changes or evolutions in the programming or the process for planning meetings that you are looking forward to implementing or exploring?

I am not in a big hurry to change anything. I believe that Gerard Venema has put so much effort to creating a rich program so I want to be careful about making big changes. Furthermore, changes are not really in my hands; we have a committee who takes member suggestions into consideration. Any transformations to the program would have to meet a need for our members and be in line with the MAA vision. If



I could change anything it would be to trim our program a bit so that attendees can attend more of the wonderful sessions that we offer. As is, our program is extremely full and any trimming to the program will have to be purposeful.

What other projects are you currently involved with (not necessarily involving the MAA)?

I am the coordinator of the SIGMAA RUME; where I get to serve my research community. I am a member of the *Embodied Mathematics Imagination and Cognition* working group, which greatly informs my research and teaching. I am one of the editors for the MAA *Instructional Practices Guide*—I am very proud of this work. I offer professional development to collegiate teachers as part of the STEM Service Courses Initiative of Project PROMESAS: *Pathways with Regional Outreach and Mathematics Excellence for Student Achievement in STEM*.

Project PROMESAS is a regional STEM initiative where mathematics faculty from a 4-year Hispanic-Serving Institution (HSI) and 2-year HSI community colleges collaboratively address systemic change in teaching. The aim of Project PROMESAS' SSC initiative is to transform mathematics pathways into STEM and to strengthen the STEM student success pipeline.

This project is funded by the US Department of Education, and is a Title III, Hispanic-Serving Institutions STEM Grant (P031C160017) through CSU-Channel Islands. Through this grant, I work with wonderful folks including my good friend Cindy Wyles who is the PI of this grant. ■

Farewell to Teaching Tidbits

Since 2016, the Teaching Tidbits blog (maateachingtidbits.blogspot.com/) have been posting regularly during the academic year to help you keep up with all of the latest educational research and pedagogical practices.

With 121,470 total pageviews, and 34 total blog posts, we have helped you find the latest advancements in pedagogy. We all want to engage our math students and invigorate our math classes, but it can be a struggle to find the time to research, plan, and execute these ideas. We hope you use our past blog posts to improve your teaching and your students' learning.

It was decided to leave the Teaching Tidbits blog online at maateachingtidbits.blogspot.com/, but end new posts when the spring 2018 semester ends. Thanks to all of our readers for their support. We hope you will continue learning about

how to improve your mathematics classroom. The MAA is continuing to support quality teaching in other ways—the most recent large effort is the Instructional Practices Guide (bit.ly/2vz483a). You might look back at our top 5 Teaching Tidbits blog posts of all time.

- The Role of Failure and Struggle in the Mathematics Classroom
- 5 Ways to Respond When Students Offer Incorrect Answer
- How to Deal with Math Anxiety in Students
- How Transparency Improves Learning
- 5 Reflective Exam Questions That Will Make you Excited about Grading



MAA Departmental
Membership Supports
Your Math Department
and Your Students

For Your Math Department & Your Career

- Use our guides to support curriculum development
- Take advantage of discounted books, student placement and homework software
- Access to journal articles and classroom resources to develop assignments
- Advertise open faculty positions on our MAA Career Resource Center
- Opportunities to present your research at MAA MathFest, Joint Mathematics Meetings, and MAA Section meetings

For Your Math Students

- Access to archive of all MAA journals and magazines
- Discounts on textbooks and registration fees at annual meetings
- Build a professional network and explore possibilities at annual and local meetings
- Educational support through research opportunities and travel grants
- Launch a job search with the resources at the MAA Career Resource Center

maa.org/join



News

2018 Tensor-SUMMA, Tensor Women and Math, and Dolciani Mathematics Enrichment Grants Awarded

The MAA supports inclusivity in mathematics through the following grant programs. On behalf of the Tensor Foundation, the MAA awarded \$145,480 in funding to encourage college and university women, pre-college girls, and under-represented groups to pursue mathematics. The funding was spread across two MAA grant programs. MAA Tensor Women and Mathematics grants funded 14 projects aimed at increasing women's involvement, totaling \$66,983. The MAA Tensor-SUMMA grants for students from historically underrepresented groups in mathematics funded 14 projects that total \$78,497.

On behalf of the Mary P. Dolciani Halloran Foundation, the MAA awarded \$70,000 in funding to 16 organizations to develop mathematical enrichment programs for talented students in middle school or high school through the MAA Dolciani Mathematics Enrichment Grants program. Since the program began in 2011, it has served 5,136 students through funding to 98 institutions.

2018 Tensor-SUMMA Projects

Research Experience in Mathematics for Young Scientists

Boise State University
PI: Liljana Babinkostova

Kittitas Valley Spanish Language Math Circle

Central Washington University
PI: Brandy Wieggers

It's Rocket Math!

Citrus College
PI: Lucia Riderer

LU STEM Students of Color Alliance

Lamar University
PI: Jacqueline Jensen-Vallin

Mathematical Modeling at Mercy College (M3C)

Mercy College
PI: Nagaraj Rao

Alliance of Indigenous Math Circles Summer Camps

Ohio University
PI: Robert Klein

Bearcat Math Circle Club

University of Cincinnati
PI: Christina Therkelsen

InForMMS+18: Investigating Forensics Mysteries through the Mathematical Sciences

Muhlenberg College
PI: Eugene Fiorini

PRIME: Pursuing Research in Mathematical Endeavors

CSU Fullerton Auxiliary Services Corporation
PI: Roberto Soto

Math Games in a Youth Sports League Setting to Enhance Mathematical Learning in Minority Students

Southern Illinois University Edwardsville
PI: Greg Budzban

Mathematical Confluences—a partnership between Temple University and the Philadelphia High School for Girls

Temple University
PI: Irina Meirea

Advanced Mathematics Program

The Regents of the University of California, Riverside
PI: Po-Ning Chen

Broadening participation to college and STEM careers through an inclusive middle school math circle program

University of California, Irvine
PI: Alessandra Pantano

Lathisms: Latin@s and Hispanics in the Mathematical Sciences

Villanova University
PI: Alexander Diaz-Lopez

2018 Tensor Women and Math Projects

PROMYS Math Circle Girls (PMCG) Initiative

Boston University
PI: Glenn Stevens

Jackson State University Girls Engaging in the Mathematical Sciences (GEMS)

Jackson State University
PI: Jana Talley



Bottom left: Supporting Math Majors Project at Huston-Tillotson.
Top right: GEMS project at JSU.

GirlsDoMath Summer Camp

Colorado Mesa University
PI: Tracii Friedman

I C Women in Math

Ithaca College
PI: Vira Babenko

Women Doing Math (WDM)

Texas State University
PI: Daniela Ferrero

Mathsketball 2019

Troy University
PI: Kenneth Roblee

Texas Women in Mathematics

Symposium 2018
University of Houston
PI: Yuliya Gorb

Girls Learning and Exploring Applications of Mathematics

University of Minnesota, Twin Cities
PI: Kaitlin Hill

All Girls/All Math Summer Camp

University of Nebraska-Lincoln
PI: Mikil Foss

University of New Haven's Summer Math Academy for Girls

University of New Haven
PI: Yevgeniya Rivers

Girls Talk Math: Engaging Girls in Mathematics Through Mentorship and Mass Media

University of North Carolina at Chapel Hill
PI: Hans Christianson

Breaking Barriers: Increasing Accessibility of Graduate School for Female Mathematics Students

Taylor University
PI: Derek Thompson

Women in Mathematics Industry Internships Network (WoMI2N) Program

West Virginia University Research Corporation
PI: Jessica Deshler

Girls in Math Club

University of South Alabama
PI: Elena Pavelescu



2018 Dolciani Mathematics Enrichment Grants (DMEG)

Expanding the Fresno Math Circle and other Enrichment Activities

California State University, Fresno
PI: Maria Nogin

Site-based Professional Development of Undergraduate and Graduate Students for Leading Math Circles

DePaul University
PI: Carolyn Narasimhan

R²MC (Red Rock Math Circle)

Dixie State University
PI: Jie Liu

The Williams High School Mathematics Club

Elon University
PI: Chad Awtrey

Inspired By Math — A Mathematics Enrichment Program in Emporia Kansas

Emporia State University
PI: Qiang Shi

Vertical Integration in Mathematics

Fairfield University
PI: Janet Striuli

FGCU Mathletes Summer Camp for Bright and Talented Middle School Students

Florida Gulf Coast University
PI: Tanya Huffman

Kutztown University Mathematics Olympiad Initiative (KUMOI)

Kutztown University of Pennsylvania
PI: Wing Hong Tony Wong

Constructing Elliptic Curves of Prime Order over Finite Fields

Georgia Southern University – Armstrong Campus
PI: Duc Huynh

Montana State University-Billings Math Circle

Montana State University-Billings
PI: Tien Chih

A STEAM Powered Math Circle

Southern Connecticut State University
PI: Braxton Carrigan

Math Circle and Math Olympiad Initiative

Stevens Institute of Technology
PI: Jan Cannizzo

Mathematical Data Science for High School Students: A University Experience

University of California, Los Angeles
PI: Nicolas Christou

Summer Illinois Math Camp

University of Illinois at Urbana-Champaign
PI: Jennifer McNeilly

Northern Colorado Math Circle for Middle School Students

University of Northern Colorado
PI: Gulden Karakok

Cottonwood High School Sherlock Club

Westminster College (UT)
PI: Kenan Ince

Dusting Off Your Bookshelf: Recreational Mathematics

—BRIAN BORCHERS

Mathematically oriented puzzles and games have existed since ancient times. More recently, recreational mathematics has become a popular topic for articles and books written for general readers, and the MAA even has a new SIGMAA dedicated to the topic (SIGMAA-Rec)! This subject goes beyond the level of simple puzzles to encompass sophisticated mathematics that has attracted the attention of professional researchers. In this month's column we'll look at some books on recreational mathematics, some classics and some more recent, that are included in the MAA's Basic Library List.

During the 19th century, mathematical puzzles frequently appeared in newspapers and magazines. The BLL contains several collections of these early mathematical puzzles, including three books by Henry Dudeney: *536 Puzzles and Curious Problems*, *Amusements in Mathematics*, and *The Canterbury Puzzles*. There are also two collections of Sam Loyd's work: *The Mathematical Puzzles of Sam Loyd*, and *Loyd's Cyclopaedia of 5000 Puzzles, Tricks, and Conundrums*. The BLL also includes *The Mathematical Recreations*

of Lewis Carroll which collects some of the writings of that author involving puzzles and games.

One theme of recreational mathematics is that seemingly simple puzzles often actually require fairly sophisticated analysis. For example, the BLL includes a book by John Beasley entitled *The Ins and Outs of Peg Solitaire*.

One important area of recreational mathematics is the study of games in which players take turns making moves with both players knowing the full state of the game at all times. This includes games like checkers, chess, and Go, but also simpler games like Nine Men's Morris. The classic reference on the analysis of these combinatorial games is found in the four volumes of *Winning Ways for Your Mathematical Plays* by Elwyn R. Berlekamp, John Horton Conway, and Richard K. Guy, which gets the highest rating of *** in the BLL. Siobhan Roberts' recent biography of Conway, *Genius at Play*, is also in the BLL with a one-star rating.

In 1956, a column titled Mathematical Games first appeared in *Scientific American*. Written by Martin Gardner, Mathematical Games ran continuously from 1956 until 1981. The columns were collected into a series of 15 books, many of which appear in the BLL. The entire collection has also been published on CD-ROM as *Martin Gardner's Mathematical Games: The Entire Collection of His Scientific American Columns*.

It's impossible to overstate the importance of Gardner's *Scientific American* columns, but a volume published after Gardner's death in 2010 entitled *Martin Gardner in the Twenty-First Century*, edited by Michael Henle and Brian Hopkins, gives some sense of his influence. Gardner introduced his readers to many new topics in recreational mathematics that have been widely studied in the years since, many of which are

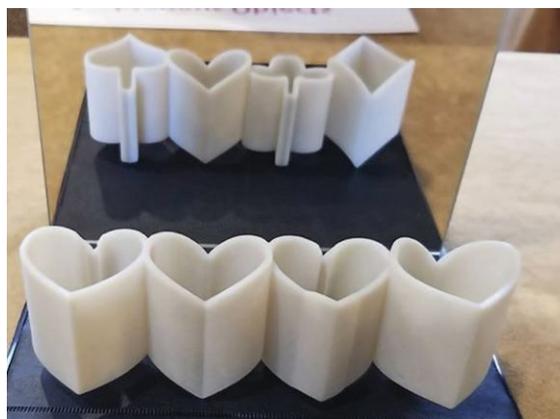


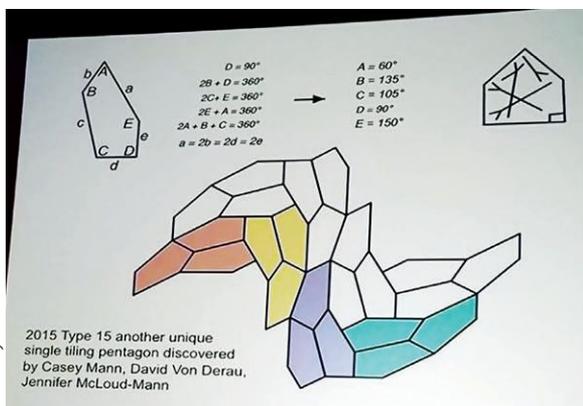
Photo by Robert Vallin

featured in other BLL books. For example, *Mathematical Games* introduced readers to polyominoes, a subject explored by Solomon Golomb in his book entitled *Polyominoes*. Gardner also introduced his readers to the problem of tiling the plane with copies of polygons. Although tiling by triangles, rectangles, and hexagons is simple to analyze, tiling by irregular pentagons turns out to be quite complex, with a new tiling pattern being discovered in 2015. The BLL includes a beautiful book on the field by Branko Grünbaum and G.C. Shephard entitled *Tilings and Patterns*.

In the early 1980's, puzzles such as Rubik's Cubes came onto the scene. Two BLL books that use these puzzles to explore ideas in group theory are John Ewing and Czes Kosniowski's *Puzzle It Out: Cubes, Groups and Puzzles* and *Adventures in Group Theory: Rubik's Cube, Merlin's Machine and Other Mathematical Toys* by David Joyner.

More recently, Sudoku and related puzzles became hugely popular in the early 2000s and the recreational mathematics community quickly began studying questions related to Sudoku. This work is represented in the BLL in a book by Jason Rosenhouse and Laura Taalman called *Taking Sudoku Seriously: The Math Behind the World's Most Popular Pencil Puzzle*.

There are many more books on various topics in recreational mathematics in the Basic Library List. The list is also regularly updated with new books and can always be found at maa.org/bl. ■



2015 Type 15 another unique single tiling pentagon discovered by Casey Mann, David Von Derau, Jennifer McCloud-Mann

Mathmusicians at MAA MathFest

—DAVID KUNG

We were both a little nervous. We'd never met before, but in a few short days would be playing music together in front of (possibly) hundreds of MAA MathFest friends. And neither of us was entirely sure what we'd gotten ourselves into.

"It's great to meet you," I gushed to pianist Eugenia Cheng, who I immediately recognized from her mathematical baking escapades on Steven Colbert (bit.ly/105u7Ar). "Let's see how it goes!" And with that, we launched into the challenging Brahms G Major Violin Sonata. Our nervous fears quickly melted away. This was going to be a blast!

Since the MAA's Centennial MathFest in 2015, we've twice convened a group of musically-inclined mathematicians to put on a concert. Everyone on stage is both a PhD mathematician and a fantastic musician. We've been treated to amazing performances by the director of the Putnam Exam (Dan Ullman, a pianist), the President of the Association for Women in Mathematics (Ami Radunskaya, who was a professional cellist before going to graduate school in math), and even a choir (led by my fellow MAA Project NEXt leader, Matt DeLong).

Every summer when we take the stage it's an exhilarating moment, both because it's so much fun to make music with mathematical colleagues, and also because we've had so little time to rehearse! We only hope that nobody in the audience can hear the struggles we've gone through to get to that point.

While I can easily fit my violin in the overhead bin, cellos and pianos aren't so portable. In Washington, DC, we man-



aged to find a local cellist willing to lend Ami his instrument. She took a cab out to his place. Amazingly, he wasn't there, but left instructions for how she could get in and take the cello. During the concert, she held our Mozart Clarinet Quintet together with an instrument she'd borrowed from a friend-of-a-friend she'd never even met!

And as for a piano, we're never sure quite what to expect. Last summer in Chicago, the hotel crew said we couldn't put the piano on stage. We did our best to place it so people could see Eugenia's fingers flying over the keyboard—while we all peered down at her from on stage. We always prepare for the worst, bringing piano tools in case any notes are particularly bad.

Most chamber music concerts are preceded by weeks or even months of rehearsals. For MAA MathFest, we get a day or two. That means awkward moments like my first meeting with Eugenia, where we've both practiced our parts separately, but never together. That's one thing for a duet, but when Matt put the choir together, getting 20 singers to blend their voices in two short rehearsals was nothing short of miraculous.

Since we're at a conference geared toward academic talks, not chamber music, we've had to get creative for

rehearsal space. In Chicago we were fortunate to be a few blocks away from Eugenia's piano studio. We're not always so lucky. One year the only piano we could find was in an executive suite. We squeezed an hour of rehearsing in between MAA committee meetings.

Of course, like all musicians, we always worry that maybe nobody will show up—or if rehearsals don't go well, we hope for that to happen! In Chicago we were mortified to find out we'd been scheduled against a free taping of NPR's *Wait, Wait, Don't Tell me!* An hour before the performance, we were thrilled to welcome our first audience member, Richard Guy. The 101-year old mathematician, who became an MAA member before any of us musicians were born, grabbed a front row seat.

Thankfully, everything came together, more people arrived, grabbing drinks at the bar in back and settling in for a wonderful evening celebrating the most important part of the MAA: the membership. ■

GET MORE

This year the musicians will perform at the President's Membership Jubilee at MAA MathFest (Thursday, August 2nd at 7 PM) while we recognize and celebrate our long-time members. Everyone who is a member will get a shout-out, but we will especially recognize those who have been members for $25 + 5n$ years. Musicians will again include Ami, Eugenia, and John Bukowski, along with newcomer Chad Topaz.

How Can a Minicourse Affect your Trajectory?

—AUDREY MALAGON

It's a sunny day in Miami as I join with lawyers, activists, and cybersecurity experts to discuss how we can ensure the 2018 elections are secure. The country has been bombarded with news that Russia attempted to interfere in our last elections, and this group will be an important part of the solution to this growing problem. How did I find myself here? It all started with math, of course, and an MAA minicourse.

For the past two years, I had been watching in shock as fake news stories spread through social media. I found myself asking where the data was to back up any of these claims. I thought we surely wouldn't support sweeping healthcare or immigration reform without even a basic analysis of the data surrounding these issues. As someone who could understand and interpret data, perhaps I could help. I readily agreed to partner with physicians and political scientists to advise our state and national representatives on current issues.

But it didn't seem to matter. Despite my explanations of the cost-saving benefits of preventative healthcare, my congressman simply voted with his party. My state representatives seemed set on their agendas based on what they believed the public wanted.

I realized then that my message about the powers of mathematics to guide good decision making was one for the public, not just politicians. I wanted to help people understand the data so they could make informed decisions about what legislation (and which legislators) they wanted to support. I could do this, I thought. I have been teaching for almost 15 years. Explaining math is what I do.

So I wrote. I wrote about the impacts of the proposed healthcare reform. I wrote about the economic realities of the DACA program. Our articles and letters appeared in local papers.

But I was still struggling to harness my message, to take my academic speak and my technical terms and craft them into language that would speak to a public who was often intimidated by anything quantitative. For years I had talked about math with professionals—people who thought like me and used the same language. Even the students in my classes had some mathematical background. These groups were no longer my only audience.

And then I saw the advertisement for the MAA Minicourse *Reach the World: Writing Math Op-Eds for a Post-Truth World*. I signed up immediately.



The course would be a workshop format where we could bring an idea and leave with a finished product ready to reach a wide audience. The organizers promised to show us how to write for a general audience, avoid common mathematician-style writing mistakes, and even find the best outlets for our work.

This was my chance, and I knew my topic immediately. Just a few years before, Philip Stark, a statistician, and Mark Lindeman, a political scientist, wrote a paper outlining a statistically sound process for auditing elections. Risk-limiting audits involve an iterative process that starts with an astonishingly small number of ballots for contests that aren't too close, and escalates to a larger sample size or a full handcount if enough discrepancies are discovered to warrant this. The best part is that, through mathematics, we can pre-determine the risk limit, the largest chance that an audit will fail to escalate to a full handcount when such a handcount would have revealed an outcome other than the reported one. States could decide what risk limit was acceptable and create an auditing process that was manageable for them. And when the auditing process was finished, they could have confidence in the results.

Virginia had just had an extremely close election in the 94th district of the house of delegates, and the public was questioning the recount process. We needed a statistically sound auditing process that would increase voter confidence in our election process. Risk-limiting audits could provide this confidence. Virginians needed to know more about them.

So, again I wrote. Armed with the tools and advice given by other mathematicians who had been writing for the public for years, I tweaked my draft. The recent 94th district election provided the perfect introduction. And since auditing was basically just quality control, I could provide a great analogy from my grandmother's stories working in a factory. I sent the finished article to my university's communications department who promised to reach out to their connections. I

found myself thinking that this article just might reach some people and make a difference.

I had no idea how big of a difference it would make. The *Virginian-Pilot* ran my article in the next Sunday edition. When I checked my email Sunday night, I had all kinds of mail about vote auditing! Most were appreciative, and a few were not. But this meant people had read the article and were talking about this important issue. I had succeeded in taking a mathematically complicated topic and reaching my community.

As I continued to scroll through the emails, I realized this article wasn't my last time talking about risk-limiting audits. A few emails down was a request from Verified Voting (verifiedvoting.org), a national election integrity organization, asking me to come to Richmond that Tuesday and testify before the state senate on behalf of legislation supporting risk-limiting audits in Virginia. I would need to explain risk-limiting audits to legislators and election officials—smart people, but people who hadn't had statistics in a while.

Over the next few weeks, I spent my Tuesdays at the state capitol. I met with senators, delegates, election officials,

and staff from the governor's office. I learned there was more to conducting audits than just the mathematics, but I also learned how important it was to have mathematicians involved in this process. For example, I was the one who insisted an incorrect definition of risk limit could not be put in the new draft of legislation. I dispelled myths about statistical processes and provided insight on how to create an auditing process that was both practical and mathematically sound. While Virginia hasn't committed to a risk-limiting audit procedure yet, we are making progress, and I'm excited about being involved in the process.

To continue this work, I joined the Election Verification Network (electionverification.org), a diverse team of professionals pushing for election security and meaningful auditing procedures, and joined them in Miami for their annual conference. The MAA minicourse pushed me outside my academic comfort zone, and I am using my mathematical expertise to make a difference in Virginia and across the country. ■

Audrey Malagon is Batten Associate Professor of Mathematics at Virginia Wesleyan University.

Minicourses at MAA MathFest

1. Initiating, Designing, Building, and Using Modeling Scenarios for Teaching Differential Equations

Part A: Thursday, August 2, 1:30 P.M.–3:30 P.M.

Part B: Friday, August 3, 1:30 P.M.–3:30 P.M.

Instructors: Brian Winkel, *SIMIODE*; Eric Sullivan, *Carroll College*; Lisa Driskell, *Colorado Mesa University*; Audrey Malagon, *Virginia Wesleyan University*

Sponsor: Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations (SIMIODE)

2. Introduction to Inquiry-Based Learning

Part A: Thursday, August 2, 4:00 P.M.–6:00 P.M.

Part B: Saturday, August 4, 1:30 P.M.–3:30 P.M.

Instructors: Brian P Katz, *Augustana College*; Victor Piercey, *Ferris State University*; Eric Kahn, *Bloomsburg University*; Candice Price, *University of San Diego*; Xiao Xiao, *Utica College*; Theron J Hitchman, *University of Northern Iowa*; Alison Marr, *Southwestern University*

Sponsor: The SIGMAA for Inquiry-Based Learning (IBL SIGMAA)

3. An Introduction to WeBWork: An Open Source Alternative for Generating and Delivering Online Homework Problems

Part A: Friday, August 3, 4:00 P.M.–6:00 P.M.

Part B: Saturday, August 4, 4:00 P.M.–6:00 P.M.

Instructors: John Travis, *Mississippi College*; Robin Cruz, *College of Idaho*; Tim Flowers, *Indiana University of Pennsylvania*

Sponsor: MAA Committee on Technology in Mathematics Education (CTiME)

4. Leading a Successful Program Review

Part A: Friday, August 3, 4:00 P.M.–6:00 P.M.

Part B: Saturday, August 4, 4:00 P.M.–6:00 P.M.

Instructors: Rick Gillman, *Valparaiso University*; Henry Walker, *Grinnell College*

Sponsor: MAA Committee on Departmental Reviews

5. Mathematical Card Magic

Part A: Thursday, August 2, 4:00 P.M.–6:00 P.M.

Part B: Saturday, August 4, 1:30 P.M.–3:30 P.M.

Instructor: Colm Mulcahy, *Spelman College*

6. Visualizing Projective Geometry Through Photographs and Perspective Drawings

Part A: Thursday, August 2, 1:30 P.M.–3:30 P.M.

Part B: Friday, August 3, 1:30 P.M.–3:30 P.M.

Instructors: Annalisa Crannell, *Franklin & Marshall College*; Fumiko Futamura, *Southwestern University*

For more information on these minicourses, including descriptions, go to maa.org/mathfest2018/minicourses.



The Power of Bravery

Allison Henrich

One of the best things my PhD advisor, Vladimir Chernov, did for me when I was a graduate student at Dartmouth College was to push me to go to conferences and learn to network. In fact, his first question to me after he agreed to be my advisor was, “What’s the next conference you’re going to?” I’m naturally somewhat shy with people I don’t know, but I can also be quite social, so this push was just what I needed to inspire me to travel, attend conferences, and make connections with mathematicians early in my career.

Once I began going to conferences, I found I really enjoyed the sense of community that comes from these events. I particularly liked conferences that were attended by a lot of other graduate students. So, as a topologist, of course I loved the Graduate Student Topology conferences that would happen each year, somewhere in the Midwest. I attended all three GST conferences during the three years I worked on my PhD thesis. Here, I got my first experiences giving conference talks. The first talk I gave (“What’s so cool about Khovanov homology?”) was entirely expository, but my talks eventually came to focus on my own research on Vassiliev invariants of virtual knots.

When I was in my last year of graduate school, I formed a plan to go to my last Graduate Student Topology conference at the University of Illinois Urbana-Champaign. My advisor suggested that I consider not just going to the conference—a comfortable place where I would spend time with other graduate students, many of whom I had met over the years—but that I also try to meet with Lou Kauffman at the University of Illinois Chicago while I was in the area.

Lou Kauffman is a well-known, highly-respected knot theorist. He is also the father of my first field of research: virtual knot theory. While the prospect of approaching him about meeting one-on-one to tell him about my dissertation research was mildly terrifying, I decided to take Chernov’s advice and contact him.

Photo above: One of Allison’s first visits with Lou at UIC.

Kauffman was very gracious when I sent him a sheepish email asking if he could make time to meet with me. Although he had a couple of other mathematicians visiting him at UIC at the time, he agreed to make an hour for me in his schedule. I was so nervous as the date and the hour of our meeting slowly approached, but I showed up (way too early), and—much to my surprise and relief—had an absolutely lovely meeting with him. Kauffman let me talk him through the main results of my dissertation, and then we thought about how they might be extended for future research. I was invited to join him and one of his visitors for lunch, and we spent time chatting, doodling, and pondering curious mathematical facts.

Over the next several years, I found myself in the Chicago area again a few times for various conferences and personal trips. Each time, I asked Kauffman if he would meet with me to chat about math. And each time, he agreed, and we had a marvelous time. We eventually decided to start having regular Skype meetings to talk about research. Some of the ideas we had for projects went nowhere, and some produced interesting results.

The first paper we wrote together, “Unknotting Unknots,” had a difficult path to success. We submitted it to one journal, and it was rejected before it even went to referees. We dutifully revised the paper and submitted it to a second journal.

The referee for this second journal pointed out that one of our main theorems had been proven elsewhere before. I was completely crushed and thought that we would be forced to abandon the paper. When I told Kauffman about the issue the referee brought up, without missing a beat, he suggested, “Let’s turn this paper into an expository article and submit it to the *Monthly*!” Fast forward a couple of years, “Unknotting Unknots” was published in the *American Mathematical Monthly* and we won the Paul R. Halmos–Lester R. Ford Award for it. More recently, we’ve jointly published a second research paper, and we are beginning work on a book on the mathematics of magic rope tricks.

The moral of the story is that going out of your comfort zone can really pay off. And in my experience introducing myself to mathematicians who were rather less receptive than Lou Kauffman to meeting me, I’ve realized that there is virtually no downside to giving it a shot and engaging with people. In fact, it helps me figure out who I might most (and least) enjoy working with, so I always gain something by gathering the courage to say hello. ■

Allison Henrich is an associate professor of mathematics at Seattle University. She is currently working with Lou Kauffman on both a research project and a book on the mathematics of rope tricks, and they are coediting a concise encyclopedia of knot theory with Colin Adams, Erica Flapan, Lew Ludwig, and Sam Nelson.

Mingle at MAA MathFest

The President’s Membership Jubilee

Thursday, August 2, 7:00 P.M.

Uniform Convergence: A One-Woman Play

Friday, August 3, 8:00 P.M.

Graduate Student Reception

Thursday, August 2, 6:00 P.M. – 7:00 P.M.

MAA-PME Student Reception

Wednesday, August 1, 4:30 P.M. – 5:30 P.M.

Math Jeopardy

Wednesday, August 1, 5:30 P.M. – 6:15 P.M.

Estimathon!

Thursday, August 2, 4:30 P.M. – 6:15 P.M.

Pi Mu Epsilon Banquet

Friday, August 3, 6:00 P.M. – 7:45 P.M.

MAA Ice Cream Social

Friday, August 3, 9:00 P.M. – 10:00 P.M.

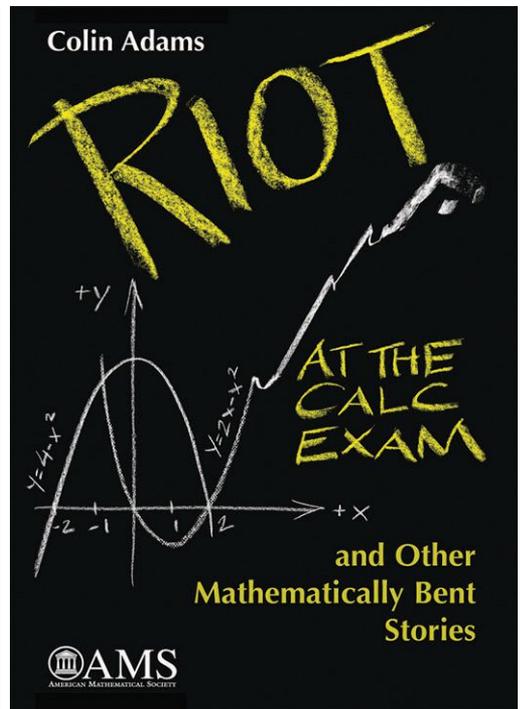
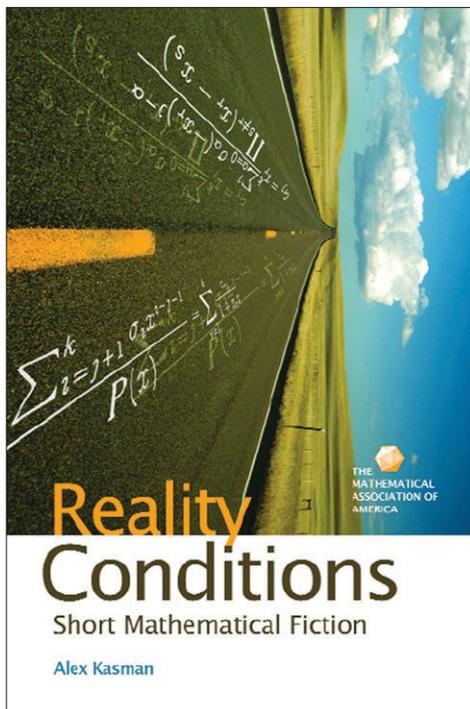
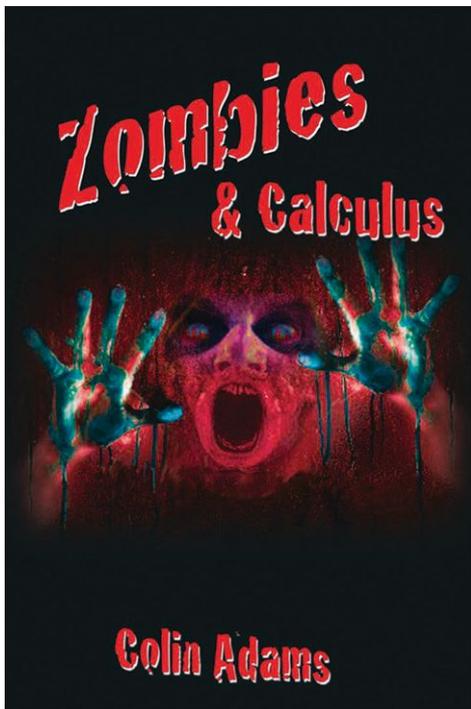
For more information on all of these events go to maa.org/mathfest2018/social_events

More about How a Minicourse Can Affect your Trajectory

—ROBERT VALLIN

According to Facebook, six years ago I posted that I had signed up for a minicourse in mathematical card tricks given at MathFest in Madison, WI (a minicourse being run again this year in Denver). My other choice was one on differential equations. In the category of You Never Know When a Small Thing Will Make a Big Difference that course led to me learning about Gilbreath sequences which directed me to writing one book chapter and two articles, getting one tattoo, and giving many talks. This brought me to the attention of people who then asked me to help co-organize two meetings (the Gathering for Gardner and MOVES, #4 is in summer 2019). In addition, some friends and I founded the new SIGMAA on Recreational Mathematics (always accepting new members!).

So I guess you just never know what’s going to happen. Taking that minicourse was the second best thing that ever happened to me at a meeting!! If you have a decision you’re waffling about, go for it! I did. ■



On Writing Math Fiction

Colin Adams

“Excuse me. Can you point me to the math fiction section?” It has always been my hope that the bookstore clerk wouldn’t look completely confused when I ask that question. No luck with that yet.

But the truth is that there is a lot of math fiction out there. Just visit Alex Kasman’s amazing mathematical fiction website at kasmana.people.cofc.edu/MATHFICT/. It now lists 1259 items. This includes 581 novels, as well as short stories, plays, movies, TV episodes, comics, etc. And this does not even include much of the children’s math literature. It reaches all the way back to Aristophanes “The Birds” from 414 BCE, so this is pretty much the entirety of what’s out there. If you want a piece to share with your students on some particular math topic, you can search the site to find some relevant material. You can even find Kasman’s own book of short math stories called *Reality Conditions*.

My own introduction to math fiction was the 1958 collection *Fantasia Mathematica*, edited by Clifton Fadiman. I first stumbled across it in the library when I was an undergraduate. It had the wonderful story “And He Built a Crooked House” by Robert Heinlein. It tells the tale of an architect who designs a house in the shape of a tesseract, a 4-dimensional cube, and the disaster that befalls the occupants of the house when there is an earthquake. I am certain that story has had the same effect on many others that it had on me. It made me want to learn more.

Before I decided to be a mathematician, I wanted to be a writer. One of my first stories, written at the age of 13, was about an astronaut floating in space. He sees a small orb that he reaches out to grasp, only noticing too late the small specks of light dotting its surface, and the shape of the continents that reveal it to be earth, which he had just destroyed by handling it. At the time, I thought it was truly profound.

But in college, my authorial career plans were derailed by mathematics, with which I became enamored. It wasn’t until I was an assistant professor that I started writing again, just for fun. Then it was short stories that had nothing to do with math.

I have always been intrigued by unusual ways to present mathematics. How do you keep a mathphobe interested long enough for them to see the beauty of mathematics? So I started writing math-related pieces.

Eventually, I turned to Ina Mette, then an editor for Springer and now an editor for AMS, and asked how I would go about publishing a book of math stories. She suggested instead that I do a column in the Springer expository magazine the *Mathematical Intelligencer*. Since 2000, I have been producing four columns a year for the *Intelligencer*, and have a collection of them, called *Riot at the Calc Exam and other Mathematically Bent Stories* published by the American Mathematical Society. It's been immense fun writing those pieces.

Most of what I do is math humor writing. It serves a valuable purpose. Many people are intimidated by mathematics. The humor helps to break that barrier. I use a lot of humor in my classes for the same reason.

My co-authors Joel Hass, Abby Thompson and I, when writing the humorous supplements *How to Ace Calculus* and *How to Ace the Rest of Calculus*, came to the conclusion, when we were trying to come up with math jokes, that one in ten standard jokes can be turned into math jokes.

Here is an example. You can imagine the original:

Two mathematicians are arguing whether they will have the opportunity to teach calculus after death and they agree that whoever dies first, they will come back and tell the other. The next day, one of them is thinking about a proof, and trips down the stairs to her death. That night, she comes to her friend in a dream.

"Tell me," says the second, "do we teach calculus after death?"

"Well," says the first, "I have good news and bad news. The good news is that yes, I am teaching calculus and the students are fantastic. Smart, motivated, responsible, interested in the epsilon-delta definition of limits. It's amazing!"

"And what's the bad news?"

The friend smiles wistfully. "Your first class meets Monday."

Teaching with Mathematical Writing

There is also math fiction that has the specific goal of teaching math. At Williams College, we have a winter study period running the length of January, in which faculty can teach whatever they fancy, so long as there is some intellectual content and some reasonable expectation of work on the part of the students. I decided to teach a course on writing topological math fiction. The students and I first covered basic 2-manifold and 3-manifold topology and then the students wrote stories that took place in various 3-manifolds, the plot line of which somehow involved the geometric or topological properties of the manifold. There were some clever pieces. One I remember involved a group of math grad students living in a house in Berkeley where the shower was a projective 3-space connect sum with the various other parts of the house. Where else would such a house be but in Berkeley?

Although the course was a lot of fun, and the students did learn quite a bit of topology, I doubt "topological fiction" will appear as a heading on a shelf in the bookstore in the near future.

What about math novels? There are a variety of them out there, including *Uncle Petros and the Goldbach Conjecture*, *The Oxford Murders*, *PopCo*, *The Curious Incident of the Dog in the Night-Time*, and my own *Zombies & Calculus*, among many others. They are often more of a window into the life of mathematicians and mathematics culture than they are a presentation of mathematics, but some do get into the mathematical details.

Math fiction can help to break down the math intimidation factor. Having students perform scripts or write and perform scripts is a wonderful way to break down barriers. Of course, doing this does not replace learning math. But for the math phobic, it can have a huge positive impact. If you are interested, you can see students performing pieces at Williams here: sites.williams.edu/cadams/theater/.

Good Mathematical Writing

What makes good math writing? The same things that make good writing generally. Good ideas, and a vigorous energetic writing style. And editing, editing, editing. As many writers will tell you, the best guide is still Strunk and White's *The Elements of Style*. I also really like Stephen King's *On Writing*, with its explicit examples of how he edited his own first drafts.

When I come up with what I think is a particularly good idea for a piece, I can sometimes write the first draft in an afternoon. But then it takes me three months to clean it up, edit it and hone it into its final form. (Please no one say you wouldn't know it by reading the pieces.)

I am always looking for new ideas. Every book I read, every movie I watch, every conversation I have, I am asking myself, how could I get a math story out of this? Like the yield for math jokes from general jokes, it's probably a similar percentage of math stories that come out of this process.

The body of math fiction continues to grow. And in the process, it continues to enliven math and attract additional converts.

"What kind of math fiction are you interested in? Historical math fiction, math mysteries, topological math, analytical math, algebraic math, math romances, math fantasy, math satire, magical math realism, math horror, math graphic novels?" Someday, when I ask my question at the bookstore, that will be the response! ■

Colin Adams is the Thomas T. Read Professor of Mathematics at Williams College. He is the author/co-author of nine books, three of which are fiction, and the rest of which probably contain a little fiction, albeit unintentionally.



Talitha Washington

You won't believe these 20+ mentoring tips really work!

By a self-proclaimed group of Math Mamas, edited by Jacqueline Jensen-Vallin and Jane Long

Carrie Diaz Eaton posed the following question to a group of Mathematical Mamas: “What was the best mentoring advice you’ve gotten?” What followed was an abundance of great advice. The members of that group thought the members of the MAA might also appreciate this shared knowledge.

Carrie Diaz Eaton began the list of advice, relating that, “I started to say something about, ‘My college doesn’t require research, so...’, to a senior woman in my field, Elsa Schaefer, and she said, “Always do enough to make yourself marketable.” Really bad advice for my particular position, really great advice for my career.”

Eaton also wrote, “a speaker I heard at the Institute for Teaching and Mentoring (she was invited to particularly inspire PhD minorities) said she kept her hair short—don’t lose that time each day.” (I can see though not all people would like this advice either.) “And always choose your health before your job. Otherwise you might have a scholarly productive, but short life.”

Sharon Crook shared that she was told, “One of the best things I did was attend a few professional development seminars on asking for what you want and the science of persuasion. So helpful! Also, make yourself indispensable—find a niche.”

“I have seen this before,” says one of Diana Thomas’ mentors every time she deals with something tough. She finds this comforting and since her mentor is strong and standing tall, she finds resilience in this message.

Kuei-Nuan Lin was told, “You lose nothing by asking. The worst case is people say no.”

Christina Sormani shared advice from Mary Rudin and Cathleen Morawetz: “Have as many kids as you want, but be sure to keep up your research while you are at it. Try not to get caught in a teaching job.”

“Take time to chill before you react. Take 1–2 days to answer a difficult e-mail,” says a mentor of Marianne Korten.

Kate Kearney was told, “Don’t eat lunch in your office.” For some this ensures a break from work. For others, it is a chance to meet people outside of their department. For others, it gives a chance to connect with others in the department by eating together.

Jessica O’Shaughnessy was told, “The drinks/meals after the talks are often more important than the talks themselves.”

Talitha Washington was stressed out in class and was told, “Go take a step aerobics class.”

Jane Long received the following advice from her husband’s aunt, Sally Lloyd, a family studies professor who was also dean at Miami University: “Don’t beat yourself up for following your gut and passing on an opportunity that might be great but has bad timing. If you prove your worth, your name will come into consideration again and you can say yes when opportunity comes at the right time.”

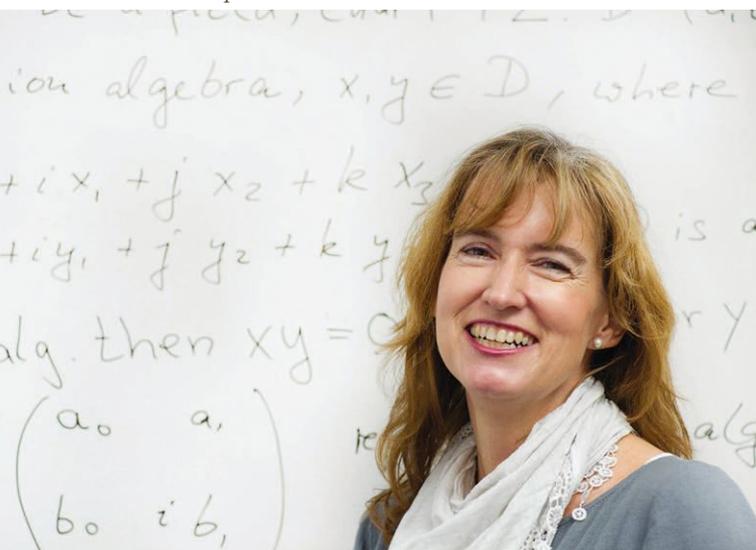
“Working out counts as time toward my job since I’m better at it when I take care of myself,” is advice that Marianne Korten has taken to heart.

Sara Del Valle was told, “Learn to say ‘no.’” Xuen Hien Nguyen added, “and your mentor can say ‘no’ for you if you can’t.”

Margaret Schroeder, regarding publications and grants, was told, “Finished is better than perfect.” And “Expect everything to be a rejection, but treat it as a rejection with feedback for resubmission (elsewhere).”

Marianne Korten offers, “When you get a paper rejected, send it to a more ambitious journal.”

Susanne Pumpluen



Emek Kose offers the following advice from Ricardo Cortez and Gloria Mari Beffa: “If you have 7 minutes to think about your research, then think about research.” She claimed this was incredible advice, since her daughter always only napped for 20–30 minutes.

Zsuzsanna Dancso offers, “You are good enough for ____.” This advice came from many people, but primarily her PhD advisor Dror Bar-Natan, who kept telling her that she was good enough for a research post-doc, and also from her post-doc mentor Anthony Licata, who kept telling her that she was good enough for the job he had hired her for, and for the next job, too.

Also along these lines, Dancso says, “I gave a talk at a conference about a result that I didn’t intend to publish because I didn’t think it was novel enough. Sergey Chmutov sat down to talk with me afterwards and told me to write it up. It was accepted at a very good journal.”

Dancso was also offered the following advice about life planning, given during graduate school by her wonderful ex-husband, Balazs Szegedy, and she claims it changed her life: “As long as you enjoy what you’re doing now, it’s a fine choice to keep doing it and to make the most of it. Even if you end up switching directions a decade down the line.”

Brandy Doleshal offers, “Always be nice to the administrative associates.”

Elsa Schaefer, when she was pregnant, was told, “This child WILL throw up all night the night before you have a big presentation to give. Never wait until the last minute to finish.”

F. Patricia Medina says, “Don’t paint yourself into a corner.” Martha Byrne encourages us to “Celebrate submissions, not acceptances.”

Kim Roth said, “Update your CV regularly. That way when you are writing grants or promotion or tenure materials, you won’t miss anything.”

Jen Bowen was asked, “What is your joy?” by Vicki Baker, management professor at Albion College.

Susanne Pumpluen was told, “Don’t take it personal.” When the group asked for clarification, she suggested using this “if someone is a jerk to you—by realizing that people are deeply flawed and so they approach things in ways that are unprofessional or inappropriate or uneducated, you feel sorry for them and have a strong (but professional) response. If you really did screw up—that just means that you need more experience and practice or a different approach, which is ok!”

Pamela E Harris offered the following story: “When I asked if she had ever dealt with the impostor syndrome and what she did to overcome it, Dr. Ana Mari Cauce (President of UW) said, ‘The impostor syndrome has never stopped, but it also has never stopped me.’”

Suzanne Dorée shared, “I started my job as non-tenure track. My aunt who was also a professor told me, ‘find something that the department believes is important but nobody



Carrie Diaz Eaton and family



Jane Long

else wants to do and do it well.' Thirty years later I am still here as a tenured full prof and chair (again). And of all the work I've done as a PhD mathematician, probably teaching developmental math and coordinating our most academically challenged students has been my proudest moment."

Manda Riehl shares the following advice from Sherrie Serros: "Leadership is a lot of listening, empathizing with the circumstances that led to a decision, and framing a discussion in terms of progress. Don't think of it as stepping on toes, sometimes you need to lift someone up to get the whole group to the next level."

Gizem Karaali offers the following advice from every older woman in her family: "This too shall pass."

Silvia Jiménez says, "Don't be scared to approach your math 'super heroes,' remember they are also people."

Last, and most definitely not least, from Beth Rushing (now President of the Appalachian College Association) to Jenny Quinn: Five things I wish I had known when I was a beginning faculty member...

1. There is a hierarchy among faculty members. Respect it.
2. You can be friendly with students, but they are not your friends.
3. Sometimes you have to say no, close the office door, and/or work at home.
4. Everyone's job is important. Be nice to the staff in your program.
5. Your job is not your life.

What's the best advice you ever got from a mentor? Send your thoughts and mentoring advice to maafocus@maa.org. Maybe your advice will be shared in a future issue of MAA FOCUS. ■

Learn more at maa.org/programs

MATHEMATICIANS NOT TO BE MISSED AT



MAA MATHFEST

August 1-4, 2018



Talitha Washington

Howard University
and National Science Foundation

MAA James R.C. Leitzel Lecture

The Relationship between Culture and
the Learning of Mathematics



Pamela Gorkin

Bucknell University

AWM-MAA Etta Zuber Falconer Lecture

Finding Ellipses



Eugenia Cheng

Art Institute of Chicago

MAA Invited Address

Inclusion-exclusion in Mathematics: Who
Stays in, Who Falls out, Why It Happens, and
What We Should Do about It



Gigliola Staffilani

Massachusetts Institute of Technology

Earle Raymond Hedrick Lecture Series

Nonlinear Dispersive Equations
and the Beautiful Mathematics
That Comes with Them



Laura Taalman

James Madison University

MAA Chan Stanek Lecture for Students

FAIL: A Mathematician's Apology



Lisette de Pillis

Harvey Mudd College

MAA Invited Address

Mathematical Medicine: Modeling
Disease and Treatment

Go to maa.org/mathfest to find more women-led talks.

Departments

PRESIDENT'S MESSAGE

Section Meeting Energy

—DEANNA HAUNSPERGER

One of the biggest pleasures of being President of the MAA is the opportunity to visit some of the MAA's 29 sections as part of the Section Visitors Program. While I haven't had the privilege of visiting all the sections yet (have you made it yet, Joe Gallian?) or even as many as Jenny Quinn likes to tease me that she's visited, I have visited 14 so far, with six of those during this academic year.

Each section has its own style, its own personality, its own traditions: while the Golden Section holds its meeting in one day with a series of plenary talks all in the same room, the Pacific Northwest Section had parallel sessions in seven different rooms. I heard great things about the "Tri-Section" meeting this year held by Indiana/Illinois/Michigan. Seaway Section is making plans for their upcoming meeting in Canada, and the Pacific Northwest is looking forward to celebrating its seventy-fifth anniversary in two years in Alaska. The Intermountain Section welcomed folks from Montana because the five-and-a-half-hour drive to Logan, Utah, was closer than their own section meeting in Seattle.

I'm always impressed when I hear stories of section members who drive five, seven, nine hours each way to attend their section meetings, and often with a van full of students to boot. There are even folks who fly to their section meetings; it's fantastic!

Students at the Wisconsin Section meeting enjoyed Face Off! and Intermountain Section students enjoyed Math Jeopardy!, both team competitions in the style of Jeopardy!



Team Gauss (with their advisor Carolyn Otto) preparing for Face Off!

Seaway had a qualifying quiz that challenged both faculty and students alike. Iowa has only fall meetings of its section because they all get together for the Iowa Collegiate Mathematics Competition in the spring. At the Golden Section, the student poster session and art exhibit are both traditions, and make for a most enjoyable break during the day. Wherever I went, students were encouraged to attend, driven great distances, welcomed, and celebrated.

Section NEXt seems to be much larger and more active in many of the sections than it was just a few years ago. Many sections have half-day workshops or mini-courses encouraging new and experienced faculty to try clickers, SAGE, group collaboration, inquiry-based learning, undergraduate research—a variety of useful tools and conversations.

The Executive Committees of the Sections work very hard maintaining the finances, planning for future years, and looking after members of their sections. All are working on increasing inclusivity of their sections: getting more grad-

With students at the Iowa Section meeting.





Audience watching Face Off! at the Wisconsin Section meeting. And the team from Carthage with their advisor Mark Snavelly.



uate students, new faculty, members of industry, and high school teachers involved. They're working on holding down the costs of meetings to keep them affordable for faculty and students both. They realize that many members of the MAA aren't able to go to national meetings, so the section is the face of the MAA, and they want those people to have the best experience possible.

I'd like to give a special shout-out to the local organizers of the meetings. You know who you are. The negotiations with the local hosting institution, the catering, the hotels, the scientific program, the student events, the registration—they all take countless hours (not that they are uncountable, just that you wouldn't want to count) to prepare and organize all so that the attendees can have a wonderful meeting and never think about any of those details. The local organizers have been thanked at every section meeting I've attended, but until you've hosted a section meeting yourself, you don't realize what a big thank-you that is.



With former Carleton Summer Math Program participants at the Seaway Section meeting.

Giving a talk at the Golden Section meeting.



Photo courtesy Jonathan E. Shapiro, Cal Poly, San Luis Obispo

A poster at the Golden Section meeting.



Photo courtesy Jonathan E. Shapiro, Cal Poly, San Luis Obispo



Nancy Neudauer with her student at the Pacific Northwest Section meeting.

Do you go to your local section meeting? You should. And you should get involved. Tell one of the officers of your section that you'd like to help out: serve on a committee, edit the newsletter, bring students, give a talk, reach out to other members of the section (local business, industry, and government people, two-year college teachers, high school teachers) and personally invite them to the section meeting, host a meeting, help mentor new faculty in your Section NExT. Your section wants you. Your section needs you. And you will get back ten-fold the energy, new ideas, and friendship that you put in.

After her talk at the Pacific Northwest Section meeting.



With students who drove to the Intermountain Section meeting from Montana.

Maybe I'm a bit of a romantic, but each time I arrived at a section meeting, it was a bit like the beginning of the movie *Love Actually* where old friends and mathematical family greeted each other with hugs and smiles; it was uplifting and invigorating – a fall section meeting is a way to start the academic year off with a pocket full of new ideas and the energy to make them happen; in the spring, a way to recharge our batteries, embrace the year as it draws to a close, and make plans for the next. I hope to see you at a section meeting near you soon! ■

Deanna Haunsperger is MAA president and professor of mathematics at Carleton College (email: dhaunspe@carleton.edu).



With local organizer Brynja Kohler at the Intermountain Section meeting.

DEAR MAA

Avoiding Implicit Bias

I was at a section meeting recently where the preliminary online program contained titles, “Dr,” for all of the male speakers, but not for the female speakers. I later found out that a couple of female mathematicians had been invited and later were not able to attend. However, all of the main plenary speakers were men. What’s up?

—Not feeling very equal

Dear Equal,

We hear you. It is important for speaker lineups to reflect the diversity of background and experience that makes our community known for its accessibility and leadership.

For local organizers who need help getting a slate of speakers that fully represents the mathematics community and our association, the MAA runs several programs that help MAA sections engage a wide range of speakers. Please learn about finding new speakers using the Section Visitors Program, Pólya Lecturers, and Editor Lectures Program on maa.org.

When scheduling conflicts and funding constraints impede inclusivity, there are additional resources to diversify your speaker lineup. The MAA Metro New York Section maintains an excellent database of diverse mathematical speakers and the MAA Twitter account interacts with a diverse group of prominent mathematicians who could serve as speakers. Some MAA Sections have used a committee to plan meetings which helps temper implicit bias. The MAA Allegheny Mountain Section, for example, has a first vice-chair and a second vice-chair. The first vice-chair makes arrangements for invited speakers and contacts the invited speakers for the spring section meeting. The second vice-chair is responsible for organizing the contributed faculty talks for the same meeting.

We commend you for bringing this issue from your MAA Section meeting to our attention because it is a welcome opportunity to examine our implicit biases and take steps to create a more inclusive, welcoming atmosphere at all MAA events. And yes, everyone who has been awarded a doctoral degree should be honored with it equally on programs.

For more guidance, MAA Section leaders and all members should reference MAA’s statement on Avoiding Implicit Bias:

The MAA gives awards to mathematicians to recognize excellence in teaching, writing, scholarship and service.

We choose speakers for national and Section meetings who are excellent expositors. We elect leaders who are knowledgeable and hard-working. Those selected are regarded as role models, so it is important that each selection process recognize a group who reflects the breadth of the Association membership and of the profession. Diversity in recognition gives visible evidence of the Association’s commitment to equity.

For the complete statement, see bit.ly/2qARzIF.



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Departments

PUZZLE PAGE

Indecipherable?

—VINCE MATSKO

“Hey, Vince, what’re you up to?”

“Just trying to put something together for the Puzzle Page in the MAA 98378525.”

“What 258371 of puzzle are you thinking about?”

“Well, an unusual 173852 of cipher.”

“What 173852?”

“The letters in certain words in the puzzle are replaced by numbers. It’s up to the solver to determine the code and decipher the message.”

“Like a cryptogram?”

“Well, not quite. Each letter may be replaced by one or two digits.”

“That’s a bit devilish....”

“I know. But this is a magazine for *mathematicians*, for crying out loud! Who teach ciphers to undergraduates—somewhere in the world—every day of every week of every month of the year.”

“Point taken.”

“But to make things a *little* different, I want two of the words to be encoded by the *same* string of digits. Doesn’t happen in the 52558828 number theory course....”

“How can that be?”

“Let’s consider a simple example. If $c = 1$, $a = 23$, $t = 45$, then “cat” would be encoded “12345.” But then so would “dog,” if $d = 12$, $o = 34$, and $g = 5$.”

“That’s truly diabolical, Vince! How will anyone ever solve it?”

“Well, the readers of the Puzzle Page are in general a pretty 253888785 bunch. But I’ll include a few easy starting points. For example, I intend to encode “*FOCUS*” and use it in an obvious way so readers will know at least one word.”

“Well, that’s helpful.”

“But there’s more... I’ll include *two* 252125 of identical ciphers, so the reader will have to figure out which two ciphers represent the *same* word, and which two represent *different* words!”

“OK, now I’m thinking diabolical again....”

“And I plan on encoding three different words which are fairly synonymous, and for which there are really only three 25388371 words which would fit in context. That’ll give the reader another entry point.”

“OK, *maybe* that’s helpful....”

“And I *also* want to go a little crazy. Include a cipher with a bunch of repeating digits, so it’s hard to split the cipher into its individual letters. Of course I run the risk of the reader thinking I’m a little 98888888825....”

“I’d say it’s more than just risky—rather a certainty.”

“And I’m even thinking of encoding two words whose numerical ciphers are palindromes!”

“You mean like ‘123’ is ‘dog’ and ‘321’ is ‘god’?”

“Yes, well, actually no.... I want to make sure that even though the ciphers are palindromes, the words actually have no letters in common!”

“Can you *do* that?”

“I think so... but to make it happen, I’ll need to 98378525 on what I’m doing. Nice chatting with you... but you are, well, a bit distracting.”

“Sorry for being such a nuisance.”

“Apology accepted! Now run along while I 93832538 my submission to the Puzzle Page. My readers await....” ■

Vince Matsko teaches at the University of San Francisco. His current passion is teaching a mathematics and digital art course. He runs the blog cre8math.com.

Mathematical Sciences Research Institute Fall Workshops, 2018 Berkeley, CA

The Mathematical Sciences Research Institute (MSRI) will hold the following workshops during the Fall of 2018. Established researchers, postdoctoral fellows and graduate students are invited to apply for funding. It is the policy of MSRI to actively seek to achieve diversity in its workshops. Thus, a strong effort is made to remove barriers that hinder equal opportunity, particularly for those groups that have been historically underrepresented in the mathematical sciences.

MSRI has a resource to assist visitors with finding childcare in Berkeley. For more information, please contact Sanjani Varkey at sanjani@msri.org.

The workshops are as follows:

August 16–17

Connections for Women: Hamiltonian Systems, from topology to applications through analysis

msri.org/workshops/859

August 20–24

Introductory Workshop: Hamiltonian systems, from topology to applications through analysis

msri.org/workshops/860

October 1–5

Hot Topics: Shape and Structure of Materials

msri.org/workshops/900

October 8–12

Hamiltonian systems, from topology to applications through analysis I

msri.org/workshops/871

November 26–30

Hamiltonian systems, from topology to applications through analysis II

msri.org/workshops/872

MSRI has been supported from its origins by the National Science Foundation, now joined by the National Security Agency, over 100 Academic Sponsor departments, by a range of private foundations, and by generous and farsighted individuals.

LETTERS TO THE EDITOR

Not your Father's Magazine

There was a commercial years ago for a General Motors car, an Oldsmobile, which said, "This is not your father's Oldsmobile. . . ." Well, MAA FOCUS is NOT your father's magazine and I say, "Thank goodness it ain't!"

It is so refreshing to see diversity, to read about "others," to not continually stare at white males, in white shirts with ties, and probably dark rimmed glasses at blackboards as the icons of our profession of teachers of mathematics in higher education as I have done in my over 50 years as MAA member. The increase in numbers of women and others in our profession is pleasant, liberating, and reassuring for a good future for all. Thank you so much for continuing and enhancing this very important education of all of us. I very much appreciate it.

I particularly liked the piece on "Whom Should We Recommend for Graduate Study?" because if we do not embrace less-than-perfect GPAs we will miss out on so many talented folks. Moreover, the nurturing that is mentioned in the piece on HBCU's speaks to the fact that we do not want to lose talented folks anymore, who, but for some quality mentoring and encouragement, will make fine contributions. Great piece! I was just speaking to a graduate of Morehouse College at a West Point function and he is considering returning to his Alma Mater following a three-year post-doc at West Point to give back, and more importantly to say, "See, you can do this too!" Thus, support through publication and sharing of good news in MAA publications is very important to complement the individual contacts as well.

Finally, I believe the overall personal approach, e.g., "Meet a Member" feature, actually touches readers and, I am sure, resonates with each reader, for these folks are like us in some way, some aspect of their professional growth, and it is always good to make such a contact. And to the point of diversity it is great when such a "member" enhances diversity and serves as support contact for a young person in need of encouragement and role model. Great job.

Brian Winkel

Director - SIMIODE - www.simiode.org
Editor Emeritus - PRIMUS
Editor Emeritus - Cryptologia
Professor Emeritus Mathematical Sciences
United States Military Academy
West Point, NY

Letters reflect writers' opinions, which do not necessarily correspond with MAA policy. Please keep letters cordial and no more than 300 words. Letters will be edited for style and length.

Clarification on Puzzle Page

I need clarification on the instructions of the puzzles on page 28 in the April/May issue of FOCUS.

Just the first, supposedly simplest, one.

"1 across"—does it span two squares, or more?

"4 down—Perfect 9th power"—does it presumably span all 5 squares? In that case it must be $3^9 = 19683$, because $2^9 = 512$, and $4^9 = 262144$.

But then we have an 3 in row 5 column 5, which contradicts the clue that the 5th row (8 across) is a perfect 8th power. No even power can end in 3.

The 3rd column, 2 down, is clued as a perfect 11th power. Now $1^{11} = 1$, 2^{11}

$= 2048$, and $3^{11} = 177147$. Which of these is 5 digits? None of them. Nor is this column consistent with the 2nd row (5 across = perfect 10th power = $3^{10} = 59049$) or the 3rd row (6 across = perfect 5th power = $6^5 = 7776$) since that gives, for 2 down, $n07nn$ (each n is an unknown digit), and I can't find any 11th power with those digits.

What am I missing?

Martin C. Tangora

Response: The length of the answers must be determined by the solver. 4-Down, for example, need not be a five-digit number.

MAA MathFest 2018 Deadlines

June 30 Advance registration deadline for MAA MathFest

July 10 Reservation discounts at the Sheraton Denver Downtown Hotel end for MAA MathFest. Rooms may fill prior to the deadline.

maa.org/mathfest

**Join us August 1–4 for
MAA MathFest in Denver!**

Departments

SECTION HAPPENINGS

Section Teaching Award Winners

Each year, every Section of the MAA is invited to select a college or university teacher to be honored with a Section Award for Distinguished College or University Teaching of Mathematics. While Sections have different ways of selecting these recipients, each of these individuals is positively affecting students at their own institutions, and frequently has reach beyond their own campus. MAA joins the individual Sections to congratulate each of the awardees recognized this year.

Allegheny Mountain

Courtney Nagle
Penn State Erie, The Behrend College

EPaDel

Maria Lorenz
Temple University

Florida

James Condor
State College of Florida

Golden Section (Alder Award)

Elizabeth Gross
San Jose State University

Golden Section (Haimo Award)

Frank Farris
Santa Clara University

Illinois

Abigail Bailey
Elgin Community College

Intermountain

Bob Palais
Utah Valley University

Metro New York

Johanna Franklin
Hofstra University

Michigan

Angela Kubena
University of Michigan

New Jersey

Robert Puhak
Rutgers University

North Central

Barry Peratt
Winona State University

Pacific Northwest

Julia Pevtsova
University of Washington

Rocky Mountain (Jones Award)

Jeanne Clelland
University of Colorado, Boulder

Rocky Mountain (Early Career)

Ian Pierce
Air Force Academy

Seaway

Carl Lutzer
Rochester Institute of Technology

Southeastern

Zachary Abernathy
Winthrop University

Southern California-Nevada

Jennifer Switkes
Cal State Polytechnic Univ-Pomona

Southwestern

Jerry Lodder
New Mexico State University

Texas

Bryant Wyatt
Tarleton State University



James Condor



Maria Lorenz



Elizabeth Gross



Frank Farris

Photo courtesy Jonathan E. Shapiro, Cal Poly, San Luis Obispo

Photo courtesy Jonathan E. Shapiro, Cal Poly, San Luis Obispo

Nominations open for MAA Awards, Prizes, and Lecturers

Mary P. Dolciani Award

for distinguished contribution to the
mathematical education of K-16 students

DUE OCTOBER 1

Henry Alder Award

for distinguished teaching by a beginning
mathematics faculty member

DUE OCTOBER 1

John and Annie Selden Prize

for research in mathematics education

DUE OCTOBER 1

Gung and Hu Award

for service to mathematics

DUE DECEMBER 1

Daniel Solow Author's Award

for authors of undergraduate
teaching materials

DUE OCTOBER 1

Haimo Award

for distinguished college or
university teaching

DUE MARCH 1

AMS-MAA-SIAM Morgan Prize

for undergraduate research

DUE JUNE 30

Send Nominations
to the MAA Secretary
secretary@maa.org

WRITING AWARDS AND LECTURERS:

Beckenbach Book Prize

Chauvenet Prize

Euler Book Prize

Hasse Prize

Robbins Prize

Hedrick Lecture

Leitzel Lecture

Pólya Lecturer

WRITING AWARDS:

Allendoerfer Award
Mathematics Magazine

Halmos-Ford Award
The American
Mathematical Monthly

Trevor Evans Award
Math Horizons Magazine

Pólya Award
College Mathematics
Journal

Meritorious
Service Award,
recommendations
from Sections
Due October 1



MAA

MATHEMATICAL ASSOCIATION OF AMERICA

Departments

MEET A MEMBER

Leon M. Hall

We have members involved in many MAA programs, SIGMAAs, and professional development opportunities. This column lets us get to know some of our members a little better.

What is your current job and how long have you been there?

My current “job” is Professor Emeritus at Missouri S&T (formerly University of Missouri Rolla). It’s a great job—I don’t have to grade papers or go to meetings, but I can still go to the office to do the things I enjoy about being a professor, including being active in MAA. I came to (then) UMR as a faculty member in 1985. I was department chair for my last 15 years before retiring in 2013.

How long have you been an MAA member, and why did you initially join?

My first faculty position was at the University of Nebraska, from 1974–1985. I joined MAA in 1983 when the Nebraska/SE South Dakota Section Meeting was coming up the next spring in Lincoln, and a couple of my friends in the department who were active in MAA convinced me to contribute a talk—I think they needed a few more to fill the program. The MAA-sponsored speaker at that section meeting was Ron Graham, definitely a heavyweight in research, and I began to realize that research and the MAA were not as separate as I thought. I really should have joined earlier, but as a young faculty member who needed to build a research record, the MAA didn’t seem as pertinent to me early in my career as the more research-oriented AMS. This perception among new faculty still exists—when I was chair, I had trouble convincing some (not all) of my young faculty members to be active in MAA, even some of those involved in Project NExT.

What has kept you an MAA member since then?

In Missouri, I began regularly attending the Missouri MAA Section Meetings, which gave me a chance to get to know, and in some cases get reacquainted with, other mathematicians throughout the state. I found a welcoming professional home in the Missouri Section, and enjoy many friendships with colleagues across the state as a result. The sections of the MAA provide a wonderful opportunity to become active in



a professional organization on a more manageable scale than that of the huge and sometimes daunting national level, and at the same time provide a way to access the national organization and maybe learn that it isn’t as daunting as one might have thought.

My activity in the Missouri Section moved past just giving talks at section meetings after I was elected Section Chair for 1991 when the meeting was held in Rolla. I learned a lot from other officers in the section during my three years as Vice-Chair, Chair, and Past-Chair. One thing I realized then, and still believe now, is that the Section Secretary (or Secretary-Treasurer as it is in Missouri) is probably the most important officer in the section. At that time, Vic Gummersheimer from Southeast Missouri State was our Secretary-Treasurer, and he impressed me with his knowledge of how the MAA and the Missouri Section worked. Vic’s successors have maintained the standard.

I got more involved in section activities when the Missouri Section began a student problem-solving contest in 1996, and the organizer, Curtis Cooper from Central Missouri State (now University of Central Missouri), asked me to be on the contest committee. Our contest, the Missouri Collegiate Mathematics Competition (MCMC), is now in its third decade, and remaining on the MCMC committee is one of the ways I remain active mathematically after retirement, even if it means grading papers once a year! Continuing to be part of the MCMC has been a very rewarding part of my MAA membership.

In 2003, I was elected Governor for the Missouri Section. This experience expanded my horizons from the section level to the national level, and I gained a lot of appreciation for the entire scope of things the MAA does. Even though it was ten years before the MAA Centennial, during my time as

Governor it was always mentioned at the Governors' Meetings that the MAA wanted a history of each section as part of the centennial activities. In my biannual Governor's Reports to the section, I kept pointing this out. Nobody volunteered. So I ended up doing it myself. It was quite helpful to have the cardboard box of materials that had been handed down from governor to governor (Vic Gummersheimer passed it on to me, in fact), and the Secretary-Treasurer let me have access to the similar box(es) associated with that office. All this material is now in the care of the Archives of American Mathematics in Austin, TX, where it can be properly cared for. I encourage other sections to do the same—those cardboard boxes contain a lot of valuable stuff and are vulnerable to all kinds of potential mishaps.

Writing the history of the Missouri Section turned out to be a bigger job than I expected, but the more I worked on it, the more interesting it became, and my main focus the first couple of years after retirement was to finish it up in time for the MAA Centennial Celebration.

Describe the MAA in four words.

Broad public mathematics advocate.

You have been involved with the American Mathematics Competitions (AMC) for much of your career. What has changed about the exams and why should they remain an MAA priority?

My first exposure to the AMC came when I was at Nebraska and thus a colleague of Walter Mientka, who was the AMC Executive Director. Then, when I started going to Missouri Section meetings, there was always a report on the high school exam from Al Tinsley, and later Shing So, the Missouri Coordinators. My first real involvement came when my son was in eighth grade and taking Algebra 1. I thought it would be good if his class participated in the AJHSME (now AMC 8), and suggested this to his teacher. I didn't want to increase his teacher's workload too much, so I volunteered to call Walter Mientka and find out details about how the class could participate. Everything went fine, the class took the AJHSME, and I figured that was that. However, soon afterward I got a call from Walter. He wanted an AJHSME coordinator for Missouri, and because I had shown interest, he thought I should do it. Walter was a great guy, and it was very hard to say no to him—I couldn't do it—and so became the Missouri AJHSME Coordinator for several years. Now, all the AMC exams are handled by the national MAA, which is probably more efficient, but people are not as involved at the section level. The Missouri Section used to give awards to the top performers in Missouri on the AMC high school exam, but we don't do that anymore, mostly because with no section coordinator there is no budget from which to get the money. I think the AMC is one of the best things the MAA

does to widely promote mathematics, and am glad to see that curriculum materials are now part of what AMC offers in addition to the exams. Incidentally, my son did not pursue a mathematics career as a result of taking the AJHSME as an eighth-grader; he is now a Costume Design Professor in the Theater Department at Coastal Carolina University, which explains the cap and green shirt in the first photo.

What would you like to see from MAA in its second century?

I would like to see more young faculty members like you [the interviewer] at colleges and universities recognize the value MAA can bring to them and their careers. Choosing a professional organization is not an either/or situation. Joining and being active in MAA doesn't mean a person can't also be active in AMS, SIAM, NCTM, ASA, or any other professional society. In fact, MAA cooperates with all these organizations. MAA does a lot of things well, which we should keep on doing, but we also should work on how to get more young folks back in the fold. How to accomplish this is, of course, the big question. "If you build it, they will come" was enough for me to come to MAA, but that doesn't seem to work as well in the twenty-first century. ■



Photo courtesy of Hang Chen, University of Central Missouri

Departments

TOOLKIT

Just-in-Time Help for Poster Sessions

—JONI BURNETTE PIRNOT AND C. ALTAY ÖZGENER

The MAA Contributed Poster Sessions (CPS) offered at MAA MathFest will be the first to offer an exciting new format. Some of the key features of this new format are that several sessions will be devoted to poster exhibits; posters will be set up in high-traffic areas; and presenters will have opportunities to discuss their work. Since the MAA will be providing corkboards or trifolds to display the posters, this presents the ideal set of circumstances to use the best technology available — \LaTeX —to create a high-quality poster that can be easily transported and/or printed on site.

So why use \LaTeX to create posters?

- The typesetting of math is superior in appearance.
- The formatting of text is easily modified for individual sections or for the entire poster.
- The author can focus on the content of the poster rather than constantly checking and revising the visual aspect.
- Content can be imported directly from research work without concern for compatibility with word processors.
- Documents—and posters—created using \LaTeX have the potential to exist forever since the program is backward compatible and is always virus free.
- The open-source nature of the program allows for continual improvement.
- A wealth of online resources are available to assist with programming.
- It's free!

In the spirit of open resources, the authors of this article are happy to share a \LaTeX template for posters. The template uses the Beamer package (ctan.org/pkg/beamerposter), which can be used to create posters ranging in sizes from A0 to A4. The **beamerposter** package is an extension of the \LaTeX **beamer** and **a0poster** classes, and it therefore has the advantages of both classes.

There are other packages to make posters such as **tikzposter** (ctan.org/pkg/tikzposter) and **baposter** (www.brian-amberg.de/uni/poster/). However, the **beamerposter** package does an exceptional job of handling color boxes in particular and alignment in general.

Some working knowledge of \LaTeX and/or **beamer** class is assumed.

The example provided here is based on the template created by Dreuw and Deselaer. (Incidentally, the poster shown in the image provides accurate details from a recent Florida Section Meeting of the MAA.) This poster template features a dark gray color scheme for content and a contrasting title and footer to highlight important information about the research/conference. Content is laid out in two columns in a portrait orientation but changing it to landscape and increasing the number of columns is quite easy. The template makes extensive use of lists for styling which promotes a clear and concise description of research. Colors can easily be edited in the style file, **beamerthemeI6pd2.sty**.

Here is how the document should look:

```
\documentclass{beamer}
\usepackage[orientation=portrait, size=a0, scale=1.4]{beamerposter}
\usepackage[absolute,overlay]{textpos}

\begin{document}
\begin{frame}[t]
  % The whole poster is enclosed in one beamer frame!
  \begin{columns}[t]
    \begin{column}{.02\textwidth}
      \end{column} % Empty spacer column
    \begin{column}{.465\textwidth} % The first column
      The first column of the poster goes here.
    \end{column} % End of the first column
    \begin{column}{.03\textwidth}
      \end{column} % Empty spacer column
    \begin{column}{.465\textwidth} % The second column
      The second column of the poster goes here.
    \end{column} % End of the second column
  \end{columns} % End of all the columns in the poster
\end{frame} % End of the enclosing frame
\end{document}
```

In this example, the **textpos** package was used in the preamble of the document as this package helps to produce a large format conference poster.

Here are some resources that can be found on the Internet:

- www.overleaf.com/gallery/tagged/poster#WrUemS7wZQI
- www.latextemplates.com/cat/conference-posters
- www.sharelatex.com/templates/presentations

Finally, the authors created a GitHub site to download all the files for the poster. The files can easily be accessed at the link: github.com/cengiz93/FOCUS.

Happy \LaTeX ing!

A sample poster can be found on the facing page. ■

Joni Burnette Pirnot and C. Altay Özgener are professors at State College of Florida, Bradenton Campus.

MAA–FTYCMA JOINT CONFERENCES

Joni Pirnot, C. Altay Özgener, Local Organization Chairs
State College of Florida, Manatee–Sarasota, Bradenton, FL

Call for Presentations

The annual joint meetings of the MAA-Florida Section and FTYCMA will be held on **February 17-18, 2017** on the campus of State College of Florida. We invite talks (either **20 minutes** or **45 minutes** in duration) and workshops or special topic sessions (**105 minutes**) from mathematicians in the State University System, the Florida Community College System, and the state's private colleges and universities. Graduate and undergraduate students are also invited to participate.

Proposals

Those who wish to be considered for the program talks or workshops should send their name, institutional affiliation, title, and an abstract of one hundred and fifty words or less to the Florida Section's Vice-President for Programs, Daniel Jelsovsky, and indicate a talk or workshop and its duration. This information should be sent via e-mail as a Word document. Deadline for submission is **December 16, 2016**.

Talks

Talks will be in **Building # 9** (close to **lot J**, and at State College of Florida's **Neel Performing Arts Center** (Building # 11), (see Campus map).

"BY THE NUMBERS"

BY THE NUMBERS is a series of short plays commissioned by the SCF theatre and math departments. Four award-winning professional theatre artists based in New York City, none of whom are mathematically talented and all of whom struggle to balance their checkbooks, allow themselves to be inspired by the names of famous theorems. Exploring the intersection between science and art by reading about math and talking to mathematicians, the playwrights' imaginations take flight, creating, for the SCF theatre students to decipher and perform, a cycle of dark, funny universes.

Acknowledgments

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Websites and Contact Information

- ▶ MAA-FL
- ▶ FTYCMA
- ▶ SCF
- ▶ Fine Arts Gallery
- ▶ Phone: **941 · 752 · 5224**
- ▶ Local Organization Chairs:
Joni Pirnot & C. Altay Özgener

Plenary speaker: Tim Chartier - VP, MAA

March Mathness

Every year, people across the United States predict who will win in the Division I NCAA Men's Basketball Tournament, often called March Madness, by filling out a tournament bracket for the postseason play. This talk discusses two popular rating methods that were used by the Bowl Championship Series, the organization that determined which college football teams were invited to which bowl games. Each rating method computes a ranking by solving a system of linear equations. We also touch on how to adapt the methods to take late season momentum into account. By the end, you'll be ready to create a mathematically-produced bracket for March Madness.



Tim Chartier

Plenary Speaker: Ken Ono - Emory University

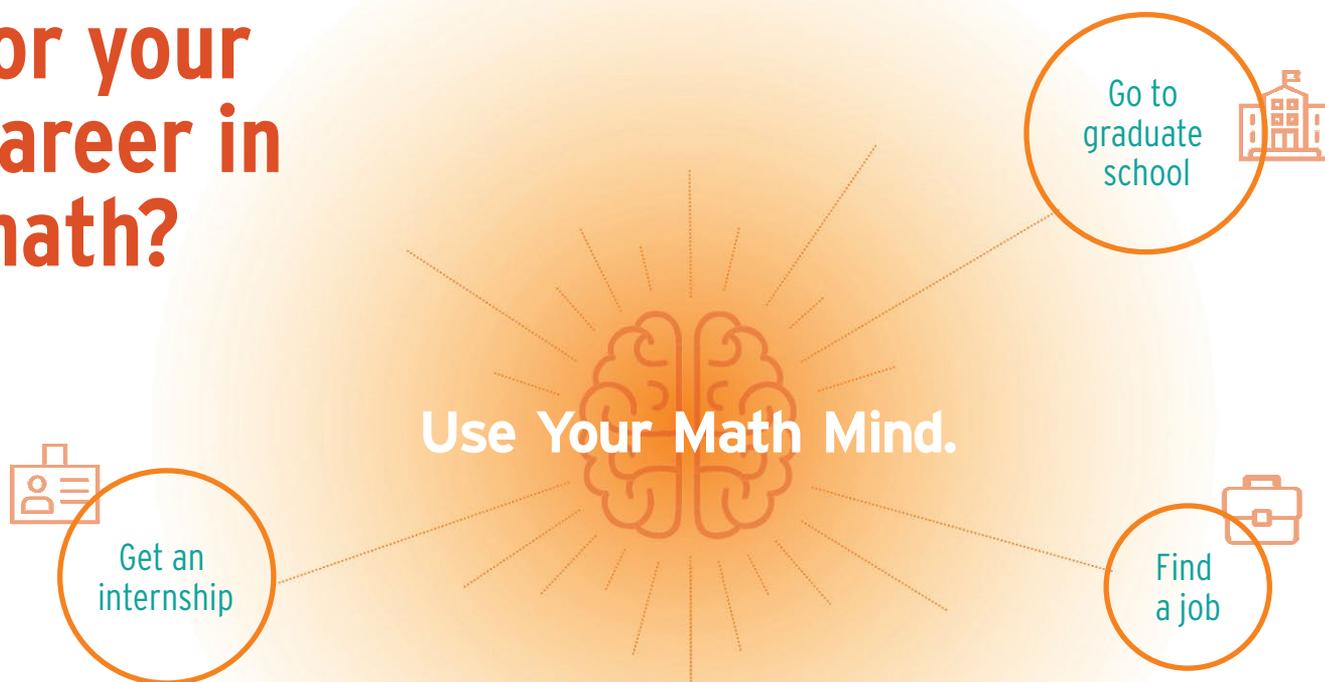
Gems of Ramanujan and their Lasting Impact on Mathematics

Ramanujan's work has a truly transformative effect on modern mathematics, and continues to do so as we understand further lines from his letters and notebooks. In this lecture, some of the studies of Ramanujan that are most accessible to the general public will be presented and how Ramanujan's findings fundamentally changed modern mathematics, and also influenced the lecturer's work, will be discussed. The speaker is an Associate Producer of the film *The Man Who Knew Infinity* (starring Dev Patel and Jeremy Irons) about Ramanujan. He will share several clips from the film in the lecture.



Ken Ono

What's next for your career in math?



Find resources on the



MAA
MATHEMATICAL ASSOCIATION OF AMERICA

CAREER ▶
RESOURCE ▶
CENTER ▶