Autumn 2018

AIMatters

Newsletter of the American Institute of Mathematics

Announcing:

The Alexanderson Award

Featuring:

~The Winning Paper: Directed Polymers in Random Media

~A Tribute to Jerry Alexanderson

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Letter from the Director

Greetings from San Jose

We've had a very busy year at AIM! Our biggest news is that we have chosen the winners of the first Alexanderson Award. Congratulations to Alexei Borodin, Ivan Corwin, and Patrik Ferrari. They will be honored at a special ceremony at the Alexanderson Lecture, to be given by Persi Diaconis, at Santa Clara University on December 12. I hope some of you can join us there.

Our research programs—workshops and SQuaREs (small groups of four to six researchers)—continue to thrive. We ran 16 workshops and 46 SQuaREs this year and received 38 new workshop proposals and a record 79 SQuaRE proposals this year. We are very fortunate that the Simons Foundation awarded us a prestigious Institute Grant, which will support six new SQuaREs each year for the next three years. Together with our NSF funding that means that we can support about 18 new SQuaREs per year.

As we went to press, we were notified by NSF that our UTMOST project has been funded. The goal of this project is to understand how students and faculty use textbooks in undergraduate courses and to produce textbooks that are more effective in promoting student learning.

The Global Math Project operates under the auspices of AIM. Its intention is to focus the attention of the world on a single math theme each year. Global Math Week begins October 10, i.e., 10/10. Last year in its inaugural year, more than 1.5 million students around the world participated. This year the kickoff event will be hosted by AIM at Santa Clara University's beautiful Charney Hall, a part of the Law School, on October 6. The hope is that more than 10 million students around the world will participate in Exploding Dots this year!

The Julia Robinson Math Festivals continue to grow with more than 50 events in the past year.

A year ago AIM hosted, sponsored jointly with MSRI, a workshop called Careers in Academia. Attendees included postdocs who were about to go on the job market seeking tenure track positions in academic departments. Some very nice videos from that workshop may be found on the AIM website.

One of the first AIM events was a conference on the Riemann Hypothesis in Seattle in August 1996. This year AIM helped organize and fund our fourth conference on this famous conjecture, which was first formulated in 1859. It was called "Perspectives on the Riemann Hypothesis" and was held June 4–7 at Bristol University.

AIM has not recorded many lectures in the past. But we have started now making videos from the first several lectures of each workshop. In addition we have short videos interviewing workshop organizers and a few SQuaREs teams. These can all be found on the main AIM web site aimath.org and also on the Institutes' website mathinstitutes.org. We hope these will be interesting and useful resources.

As always, if you are in the Bay Area we invite you to stop in to visit. And in the meantime I hope you enjoy this special issue of AIMatters, dedicated to Jerry Alexanderson, who has been an inspiration to many of us at AIM! ■

Brian Conrey

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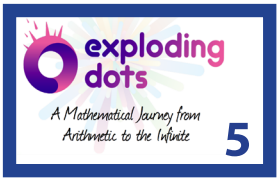
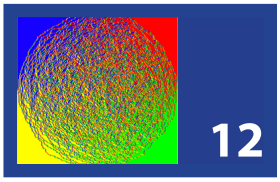




ABOUT THE COVER IMAGE

This issue is dedicated to Gerald (Jerry) Alexanderson. Jerry recently became a Professor Emeritus at Santa Clara University and now has an office full of his favorite books and papers at AIM. Sonya Kohli, AIM staff member, took the cover photo of Jerry enjoying his new office.

Perspectives on RH
Part IV of a Series

In August 1996 one of the first AIM events was a conference in Seattle with the rather lengthy title "In Celebration of the centenary of the proof of the Prime Number Theorem, A symposium on the Riemann Hypothesis." It was held right at the end of the Mathematical Association of America (MAA) MathFest; in fact the first lecture of the symposium was the last lecture of the MathFest, a public lecture by Atle Selberg on the history of the prime number theorem. It was attended by more than 500 people who gave Selberg a standing ovation at the end!

That was followed by two more conferences on the Riemann Hypothesis: in 1998 at a conference organized by Alain Connes at the Schrödinger Institute in Vienna and in 2002 at a conference organized by Peter Sarnak at the Courant Institute of New York University.

It's no wonder that in the early years of AIM, people were convinced that AIM was an institute solely devoted to solving the Riemann Hypothesis! Fast forward 20 years to the University of Bristol in June of this year for part IV of this series: "Perspectives on the Riemann Hypothesis." The conference was funded by AIM, the NSF, the Engineering and Physical Sciences Research Council, the Heilbronn Institute, University of Bristol, and the Clay Mathematics Institute. It featured 17 lectures (including talks by Enrico Bombieri (Institute for Advanced Study), Alain Connes (College de France), Terry Tau (UCLA), and Peter Sarnak (Princeton University and Institute for Advanced Study)) and an AIM-style problem session moderated by David Farmer. There were 180 participants in attendance, which coincided with the capacity of the lecture hall. An additional 50 people were on a waiting list to attend. Videos may be found on the AIM website at aimath.org.

There are extensive photos, the conference poster, the problem list, and a list of participants at https://aimath.org/rh2018/. Our hope is to have RH V in 2020 and RH VI in 2024 (provided, of course, that it's not solved by then!). ■

– Brian Conrey

Participants enjoyed themselves at University of Bristol.

New Funding at AIM

Expanding SQuaREs and Increasing Diversity

We are happy and grateful to announce that AIM received a grant from the Simons Foundation to help fund our SQuaREs program. The Simons Foundation was co-founded in New York City by Jim and Marilyn Simons to support basic research undertaken in the pursuit of understanding the phenomena of our world.

The SQuaRE program was introduced in 2007 to support collaborations of four to six researchers who meet multiple times for week-long intervals in order to make progress on hard, important, and interesting research problems. SQuaRE topics have covered a wide range of pure and applied mathematics, from modeling ocular blood flow and its role in development of glaucoma to classical problems in number theory.

This program has proved to be extremely popular and competitive, and so we have been able to support only a small fraction of the proposals submitted. In the past, many excellent projects did not receive support. The Simons Foundation grant will allow us to increase the number of SQuaREs accepted each year so that we can now support 18 new SQuaREs each year for a total of approximately 60 new and returning research groups.

In addition to the Simons Foundation grant, AIM also recently received a supplement to our core NSF grant to address the the lack of representation of Hispanic and African-Americans in the mathematical community. AIM will host planning workshops for the leaders of these communities to organize events and develop strategies to help and support change and to broaden participation. One important goal is to create networks so that students and faculty can be informed about mathematical activities, opportunities, and connections. The supplement grant is part of the new NSF INCLUDES initiative, which supports projects that can promote and effectively develop STEM talent from all sectors and groups in our society. ■

– Estelle Basor

Global Math Week

October 10, 2018

Last October, a million and a half students participated in Global Math Week. They experienced Exploding Dots, a refreshing and powerful mathematical approach to arithmetic and algebra developed by project co-founder James Tanton.

The goal of the project is to engage students and teachers around the world in thinking and talking about the same piece of mathematics during one class period to create a forum for the global celebration of creative mathematical thinking.

Now, in 2018, the Global Math Project is hoping to connect with more students and teachers across the globe. After last year's success, Exploding Dots will be back, better than ever.

On October 6, Global Math Project is having a kick-off day, with a symposium consisting of special talks and presentations at Santa Clara University followed by a reception at the Tech Museum in San Jose, CA.

The Global Math Week 2018 main activity is on October 10, with a participation goal of 10 million students worldwide. Learn how you can get involved and register to participate at https://www.globalmathproject.org. ■

– Brianna Donaldson and Sonya Kohli

Dispatches from Morgan Hill

Making it Count

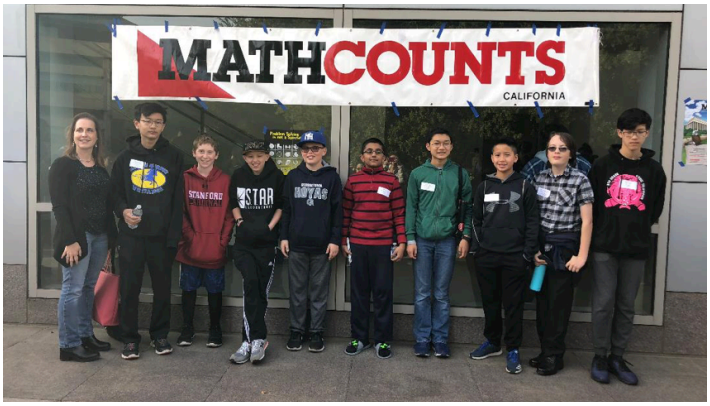
Since 2004 Morgan Hill Math has been working with students who live in or around Morgan Hill and are looking for mathematical challenges outside of the normal school curriculum. This outreach program sponsored by AIM provides math enrichment to about 300 students each year. Now we are also reaching out to local math teachers!

In October of 2017, with the help of Brian Conrey, we launched the Morgan Hill Math Teachers' Circle, part of the national Math Teachers' Circle (MTC) network. Local math teachers in any grade attended monthly meetings to explore rich math problems, rediscover the joy in learning math, and network with fellow teachers and mathematicians. Meetings were held on the last Wednesday of the month, at the Morgan Hill Community and Cultural Center. We held six meetings over the course of the school year where we explored the mathematics behind SET, Exploding Dots, prime numbers, long division, poker combinatorics, and rock/paper/scissors and voting. The Morgan Hill Math Teachers' Circle is part of the Bay Area Teachers and Mathematicians (BATMath) Network.

Of course our greatest impact is on the kids who attend our programs. Last year, our youngest students, fourth and fifth graders enrolled in our eight-week Mathletics program, enjoyed lessons that included learning to solve Sudoku, discovering pi, exploring angles, working backwards to solve problems, and comparing area versus perimeter. Students in MathCounts6 were introduced to more advanced problem solving concepts including proportions, permutations, and combinations; all skills that are necessary for successfully competing in the MATHCOUNTS competition series. Some of these students also enjoyed classic MTC sessions such as SET, Exploding Dots, Grid Power, Rational Tangles, and Derangements.

Enthusiastic students from our fourth- through eighth-grade classes were invited to participate in the Math Olympiad (grades 4-8) competition. From November to March, over 90 students were challenged to strengthen their problem solving skills in this once-a-month, five-question test. Two Morgan Hill students won the George Lenchner Medallion for achieving perfect scores in the Middle School division: Antarish Rautela and Neil Shah! Only 0.5% of the nearly 100,000 participants received this award.

The cornerstone of the Morgan Hill Math program has always been the training for and competition in MATHCOUNTS. This Competition Series has four levels of competition: school, chapter, state, and national. For the school competition, over 60 students, from nine local schools, trained with me from



Top: Morgan Hill students competing at the Northern California State Competition at Stanford.
Bottom: Competitors from the MATHCOUNTS Coyote Valley Chapter Competition.

September through December, sharpening their skills in counting, series and sequences, probability, permutations and combinations, functions, algebra, and geometry. In January, 32 students continued to train all together to prepare for the chapter competition.

Morgan Hill students are such fierce math competitors that in 2017, I was given the opportunity to create and coordinate a brand new chapter for Morgan Hill: the Coyote Valley Chapter. Eighth-grader Neil Shah only missed one question, achieving an almost perfect score of 44 out of 46. He won three First Place trophies that day: Highest Individual Score, Countdown Round Winner, and First Place in the Team Competition. For the second year in a row, the team from Martin Murphy Middle School won the Team Round, closely followed by the team from Charter School of Morgan Hill. These eight students, as well as a student from Oakwood School and another Murphy student, qualified to compete in the Northern California MATHCOUNTS State Competition at Stanford.

Our middle school Mathletes participated in several other competitions this year. All students involved in the weekly MATHCOUNTS training classes, as well as interested fifth- and sixth-graders, took the AMC8, an MAA competition for students in eighth grade and below. Many of them also challenged themselves with the AMC10 exam. By scoring in the top 2.5% in the United States and Canada on the AMC10, Neil Shah qualified to take the American Invitational Mathematics Exam (AIME), which is the first in a series of examinations that culminate with the International Mathematical Olympiad (IMO). He scored an impressive five and hopes to improve his score and qualify in years to come.

For the fourth year in a row, six of Morgan Hill Math's top middle school students competed in the on-line Purple Comet! Math Meet. This year, in the Middle School Mixed Team category, by scoring 16 out of 20, Morgan Hill Math students *tied for First place in California, Second place in the United States, and landed on the Honorable Mention list for the entire international competition!*

Ann Sobrato High School's chapter of the national math honors society, Mu Alpha Theta, thrived under new student leadership. Math Club President, Seth Dubridge, attracted many new members this year by entering Sobrato into the weekly Math Madness competition. As a joint initiative between (AMC) and AreteLabs, Math Madness is emerging as one of the premiere math competition events in the United States.

After working tirelessly as the Morgan Hill Math program director since its beginnings, Lori Mains has retired. It is with a heavy heart that we say goodbye to her. Morgan Hill Math would not be the success it is today without her leadership over the years. We wish her the very best of luck! ■

– Kelley Barnes

Top: Neil Shah with his three MATHCOUNTS Coyote Valley Chapter Competition trophies.
Bottom: Top Math Olympiad competitors, fourth through sixth grade.

Celebrating the Joy of Math

Around the World with JRMF

A Julia Robinson Mathematics Festival (JRMF) is a day-long event for students of all ages, kindergarten through high school. Inspired by the life and work of Julia Robinson, the festivals bring students and families together to explore the richness and beauty of mathematics with an emphasis on collaborative and creative problem-solving. They appeal to all sorts of personalities and are especially appropriate for those who do not enjoy the atmosphere of competitive events or the pressure of timed tests. We are making special efforts to hold festivals in inner-cities so that we can reach students in under-resourced environments. A Julia Robinson Mathematics Festival is an event for the whole community, bringing together students, teachers, parents, schools, and universities, all to celebrate the joy of mathematics.

Local hosts provide a venue for a festival, tables and chairs, and the facilitators who guide the student activities. Our national JRMF organization lends support with activities, problem sets, puzzles, and games from our databank of over 100 activities. We provide guides for the facilitators for many of the activities. We also provide a registration system for local groups, and we advise them on funding their festival, recruiting facilitators, and advertising.

The reach of JRMF Festivals is growing. During the past year JRMF and our partners have reached more than 5000 students in 16 states and five foreign countries with more than 50 festivals. At the National Math Festival in April in Washington, D.C., JRMF organized one of the most popular exhibit halls: an estimated 20,000 parents, children, and professionals attended.

A Julia Robinson Mathematics Festival is often hosted by a Math Teachers' Circle, a student math circle, or by a math club. If you are interested, please send an email query to info@jrmf.org. We would love to support your efforts. Please check out our website at www.jrmf.org. ■

– Alice Peters

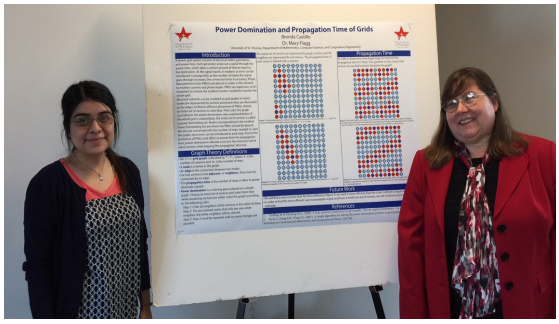
Participants enjoy solving puzzles at Julia Robinson Mathematics Festivals.

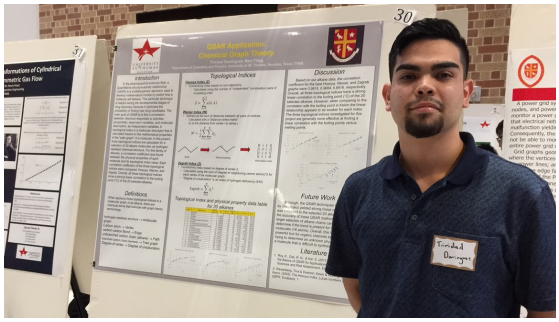
Finding a Home with REUF

Mary Flagg Welcomes Students

Mary Flagg has had an unusual scientific and personal journey with many detours. The Research Experiences for Undergraduate Faculty (REUF) program has played a critical role in allowing her to find a mathematical research area that she loves that she can share with her students.

After earning her BS in Chemical Engineering from Rice, she went to Cal Tech on an NSF graduate fellowship, where she earned her MS and saw that an engineering career was not for her. Then life happened—she got married and raised a family. Along the way she realized her true calling was mathematics and that she wanted to both teach and do research. Eventually she earned her PhD from the University of Houston with a thesis entitled, "The role of the Jacobson radical of the endomorphism ring in the Baer-Kaplansky theorem."





Top: Brenda Castillo and Mary Flagg at the April 2017 University of St. Thomas Undergraduate Research Symposium. Bottom: Trinidad Dominguez at the April 2018 UST Undergraduate Research Symposium.

She took a position as a lecturer at the University of Houston, a job without a research expectation, but she persisted in her goal to combine research and teaching and kept her eye out for opportunities to do so–especially research involving students as collaborators. As Mary says, "For me, math research is play, and I am always looking for new things to play with. ... I want to pull every student in to join the fun." In 2013 she found the opportunity she had been looking for and started as an assistant professor at the University of St. Thomas in Houston. Just recently she was promoted to associate professor with tenure.

Although Mary continued her research in abstract algebra, it is a difficult area for student research, and so she looked for and participated in workshops and short courses in other areas of mathematics. At the Joint Mathematics Meetings in January 2015, she overheard Brianna Donaldson, AIM's Director of Special Projects, describing REUF. Mary's application for the summer REUF workshop was accepted, leading her to spend a week at the Institute for Computational and Experimental Mathematics (ICERM) at Brown University in Providence. She participated in a research group led by Leslie Hogben, AIM Associate Director for Diversity, on problems about coloring games on graphs dealing with "zero forcing" and "power domination." The workshop experience was transformative for Mary. She found collaborators and a mathematical home where her students feel welcome.

Most of the faculty of that research group have continued their collaboration, with several additional meetings and two published papers. Mary has supervised research projects with 16 students, including 11 who worked on zero forcing and power domination. She has participated in a standard AIM workshop on zero forcing and organized a special session at another conference. Because of her, the capstone course at St. Thomas is no longer one in which students sit passively in lectures; now they actively participate in mathematical research and discovery. She says, "I can explain my work about zero forcing and power domination to students and faculty in other areas, and they get excited. An English professor at St. Thomas remarked in a faculty meeting about a 'cool math talk!'" ■

– Leslie Hogben

The Alexanderson Award

Recognizing Outstanding Scholarship at AIM

Gerald (Jerry) Alexanderson, Professor of Mathematics at Santa Clara University, has played a formative role at the American Institute of Mathematics since its inception in 1994. As founding chair of AIM's Board of Trustees, Jerry continues to support AIM's efforts, which have distinguished it internationally as a mathematical sciences research institute committed to productive collaboration.

To honor Jerry's contributions, AIM is pleased to announce the Alexanderson Award. This annual prize recognizes outstanding scholarly articles arising from AIM research activities that have been published within the past few years. Receiving the first award are Alexei Borodin, Ivan Corwin, and Patrik Ferrari for their article, "Free energy fluctuations for directed polymers in random media in 1+1 dimensions," Communications in Pure and Applied Mathematics, 67 (2014), 1129-1214 (MR3207195).

This year also marks Jerry's retirement from the Mathematics Department of Santa Clara University. For more than 60 years, Jerry has shared his enthusiasm for the world of mathematics: its characters, their stories, along with their achievements. Generations of students fondly recall and treasure their memories of Jerry's classes and conversations. In this issue, we provide excerpts from personal accounts of some recipients of Jerry's generous spirit.

A special celebration for the first Alexanderson Award will be held at Santa Clara University on Wednesday, December 12, 2018. The event will include a public talk by Persi Diaconis of Stanford University, followed by a reception for the award recipients. ■

Excerpts from Colleagues and Past Students

(complete letters are available at aimath.org)

I was a student at Santa Clara University from 1975 to 1978, choosing a major in mathematics towards the end of my first year. I managed to miss Jerry's legendary Honors calculus course. ... But Jerry took an interest in me anyway, simply by virtue of being part of the department. Very shortly after taking my first faculty position, I was invited to help grade the Putnam Competition, serve as a referee for Mathematics Magazine. Besides involving me in valuable activities early in my career, Jerry also graciously wrote several letters of recommendation for me. I greatly appreciated the President of the Mathematical Association of America taking the time to do that!

– Rob Beezer, University of Puget Sound

Jerry Alexanderson built the Department of Mathematics at Santa Clara University as we know it today. Sure, there was a department before his time and many have contributed to its growth, but whatever success we have had is largely due to Jerry's efforts in hiring excellent faculty and keeping us connected to the larger mathematical community. Our Chair for 35 years(!), he brought Paul Halmos onto our faculty and encouraged Paul and his wife Virginia to contribute money that now funds our Halmos Visiting Professor. It's hard to imagine a single person making a larger contribution to any department at any university!

– Frank A. Farris, Santa Clara University

... Jerry himself has contributed so much to the mathematical community through his books, articles, teaching, and service, which have been justly recognized by distinguished awards. I consider myself amazingly lucky to have the privilege of a long and entertaining correspondence from Jerry working with him on the Bulletin covers. I am delighted that AIM has established the Alexanderson Award honoring Jerry.

– Susan Friedlander, Chief Editor, American Mathematical Society Bulletin

Jerry Alexanderson
A Lifetime of Service and Inspiration

A member of the Santa Clara faculty since 1958, Jerry has served his institution and the broader mathematics community in various capacities. During this time, he was chair of the Mathematics department for 35 years and a member of the Faculty Senate Council. For 38 years, he held the endowed Valeriote Professorship of Science chair. Known as an inspiring teacher and popular author, Alexanderson has cultivated a passion for problem solving and has promoted creative mathematical thinking as longstanding Associate Director of the prestigious William Lowell Putnam Competition. He is author of nineteen books, including textbooks in abstract algebra, as well as discrete and combinatorial mathematics. Alexanderson was the first recipient of Santa Clara University's Bayma Award for Scholarship, and he received the Special Appreciation Award from the Dean of Arts and Sciences as well as the Special Recognition Award for Teaching, Research, and Service from the President of the university. In 2005, the significant impact of Jerry's extraordinary teaching success beyond his home institution was recognized with the Haimo Award from the Mathematical Association of America.

Alexanderson's influence has extended to the national level, where he has played a leading and lasting role in the Mathematical Association of America (MAA). His contributions to the MAA have spanned more than 50 committees and 24 years on the Board of Governors, encompassing secretary, vice-president, and president of the Association and editor of Mathematics Magazine.

Results of this work include the remodeling of the MAA Carriage House in Washington, D.C., into its Mathematical Sciences Conference Center. In this time, Jerry served on the Science Policy Committee of the American Mathematical Society (AMS) and was a consultant to the Editorial Board for the Bulletin of the AMS. In testament to his expansive record, Alexanderson received the MAA's most prestigious award for distinguished service to Mathematics, the Yueh-Gin Gung and Dr. Charles Y. Hu award. Noted for his stewardship and as a mentor to many in the mathematics community, Jerry was instrumental to the success of the American Institute of Mathematics as an international center for collaborative mathematical sciences research. ■

Jerry Alexanderson turned me into a mathematician. Or perhaps he was the person who recognized that I was a mathematician. When I wandered into Jerry's classroom, I was a physics major. Soon thereafter, I was a math major. It's not clear what aspect of Jerry made me see the light. Mathematics in one of his classes was fun, but it was also challenging. Indeed, I learned from Jerry that if it wasn't hard, it wasn't going to be fun. I am not the only SCU undergraduate to whom this happened. Many of my classmates seemed to have been poached from other departments. While it is clear that Jerry loves mathematics, he seems almost more fond of mathematicians, in a way that I found infectious.

- Ed Dunne, American Mathematical Society

The Winning Paper
Directed Polymers in Random Media

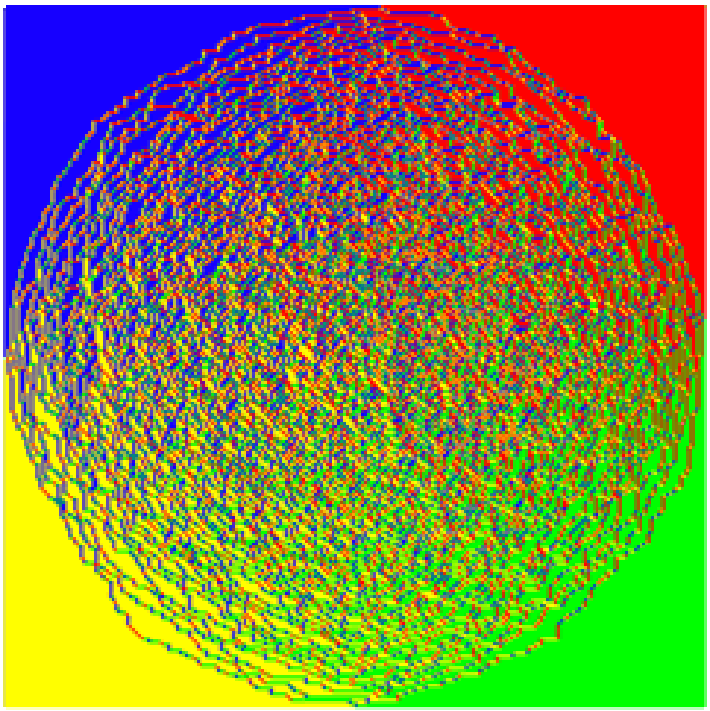
Receiving the first Alexanderson Award are Alexei Borodin, Ivan Corwin, and Patrik Ferrari for their article, "Free energy fluctuations for directed polymers in random media in 1+1 dimensions," Communications in Pure and Applied Mathematics, 67 (2014), 1129-1214. This work began during the October 2011 AIM workshop, "The Kardar-Parisi-Zhang equation and universality class."

One of the main goals in the study of probability is to understand the behavior of large, complex, random systems. At the coarsest level, this involves understanding the average or typical behavior of a system. That alone is often not enough, and it is important to quantify how systems fluctuate or differ from their average. What are the extreme behaviors and how commonly do they occur?

Examples of systems where extreme events and random fluctuations are important to understand include the weather, cancer growth, and engineering processes where an extreme event can cause a catastrophe. The award winning paper concerns the extreme behavior of certain models for polymers—long chains of molecules that occur in nearly every manufactured product. If a polymer is dissolved in a solution, it forms a twisting, turning, thread that is unlikely to stretch out like a line, and which also is unlikely to curl into a tight ball. The typical behavior lies somewhere in between, like a loosely knotted floppy mound of string. Often times, the solution in which the polymers lie may be disordered, having random impurities or temperature variations that affect the overall probability of a given configuration. Directed polymers model such systems, when there is some external force pulling the polymer in a given direction.

The winning paper addresses the effect of the disorder on the configuration and energy of such polymers. The authors discovered that the behavior of such polymers is governed by a mathematical law that has been observed in several other situations. Mathematicians use the term "universal" to describe a rule that arises from seemingly unrelated phenomena. The most famous universal law is the "bell shaped curve" that governs the distribution of the heights of people, SAT scores, and errors in scientific measurements.

The universal law arising in this work comes from the "Kardar-Parisi-Zhang equation," which models a variety of real world systems including growth processes (e.g., bacterial colony formation, cancer growth), development of cracks in materials, vortices in super-conductors, and movement of particles in random media. The statistical distributions (related to the "Tracy-Widom distributions") studied in this paper in relation to these models have implications in physics, engineering, materials science, biology, ecology, and other applied fields. These distributions should be thought of as modern day equivalents to the bell curve (or Gaussian distribution). They are ubiquitous, cropping up all over science and mathematics. *(For the full description of the winning paper, see https://aimath.org/alexanderson-award/.)* ■



Limiting fluctuations near the boundary of the random region of the tiling above satisfy the same universal law as the directed polymers.

A Tribute to Jerry
Historian, Collector, and Mathematician

From Herbert McLean Evans to Robert B. Honeyman, Harrison Horblit to Haskell Norman, there have been a number of distinguished 20th century collectors of books on the history of science, ranging across disciplines, principally focused on "epochal achievements" (to quote Evans). Collectors single mindedly devoted to rare mathematics are much scarcer: David Eugene Smith and George A. Plimpton, the great benefactors of Columbia University, notably come to mind.

Jerry Alexanderson would demur at the comparison, but like Smith, he's a teacher and historian of mathematics who ardently, if selectively, collects mathematical materials. Since the early 1960's—when mathematics was hardly the hot topic it is today—Jerry has been quietly building an enormously impressive collection, replete with names like Euler, Cauchy, Gauss, and Newton.

As the volumes stacked on the shelves of his office and home, overflowing his desk and mounting in careful piles on floor and chairs will attest, the quest for mathematical texts remains an ongoing passion, and one that Jerry readily shares, via articles illustrated with images from his collection, and with students, colleagues, friends, and librarians.

For nearly 30 years, I've been a lucky recipient of Jerry's generosity. We've met over lunch, chatted in the aisles of book fairs, compared copies, clucked about prices, crowed about acquisitions, and of course traded emails, his being invariably witty and understated. What an education it's been! And what a pleasure. Thank you, Jerry. ■

– Ellen Heffelfinger, Librarian
Fry's Electronics
American Institute of Mathematics

CALL FOR PROPOSALS

We are seeking proposals for week-long workshops for up to 28 people and SQuaRE collaborations for 4-6 researchers to take place in 2019-20 at AIM in San Jose, CA.

Proposals require:

- **a list of organizers**
- **a list of potential participants**
- **a description of goals**
- **an outline of how goals will be met**

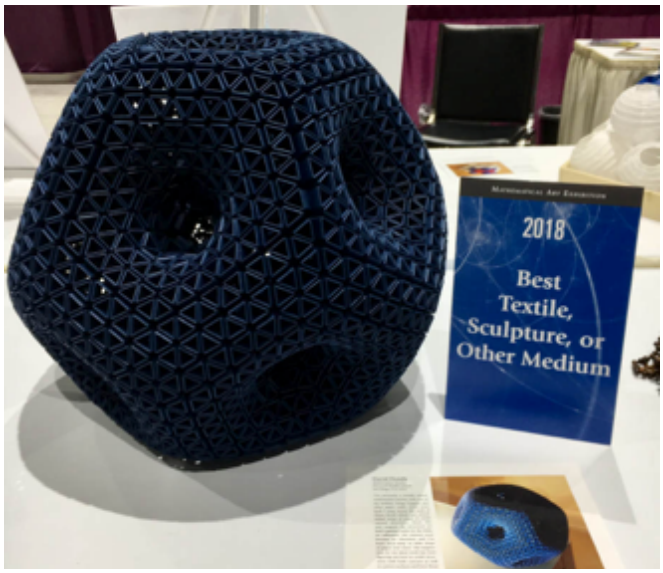
Application deadline: November 1, 2018.

For more details and online applications:
www.aimath.org/research

The Art of Folding

Snapology Origami

At the Joint Mathematics Meetings (JMM) in January 2018, middle school math teacher and San Diego Math Teachers' Circle (MTC) member, David Honda, won the Bridges Art Exhibition category for Best Textile, Sculpture, or Other Medium. Honda sat down with MTCircular (the newsletter for the MTC network) to talk about his prize-winning sculpture, "Dodecahedral 11-Hole Torus," and the challenge of creating an origami structure.



Honda's winning Snapology

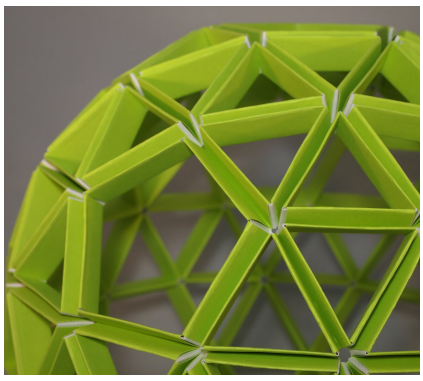
For Honda it all started with origami, which led him to snapology, a type of origami using folded strips of paper to create different shapes. He was drawn to snapology when he came upon the work of Heinz Strobl, the father of snapology. Honda began to create his own artwork using components modeled on solid polyhedra. He was led further into the exploration of the connections between mathematics and origami when Yana Mohanty, a coordinator of the San Diego MTC, commented on the topological aspects of his work.

"Most of my work starts with asking those 'what if…?' questions," says Honda. "'What if I start with creating circles? Could I then join them and make tube-like structures? What if I try to create two intersecting pieces?' After that I usually have a basic idea of what I want to attempt, but then it's a lot of prototyping." He goes on to say that often he has to rethink the construction of his pieces and then remake them because they cannot be completed as originally envisioned. Weight, size, and stiffness of the paper all need to be taken into account when creating a snapology work. Many attempts may precede the successful completion of a piece. Honda admitted that the prize-winning work from the JMM art exhibit was the fourth version of that piece.

When asked how the San Diego MTC has influenced his teaching and his artistic work, he replied, "MTC has had a major influence on my work. As a veteran middle school teacher, I get the chance to explore and revisit math that I haven't seen since my college days. MTC explorations often inspire ideas for my snapology work. Most importantly, if it weren't for the encouragement of Yana and David Patrick (also a San Diego MTC coordinator), I never would have entered the JMM art exhibit. It's because of MTC and its people that I've had the opportunity to share snapology with others."

After the January exhibit, Honda recreated an earlier piece in order to photograph it with a 360° camera. You can see this cool video on Honda's website, http://snaporigami.weebly.com. ■

– Sonya Kohli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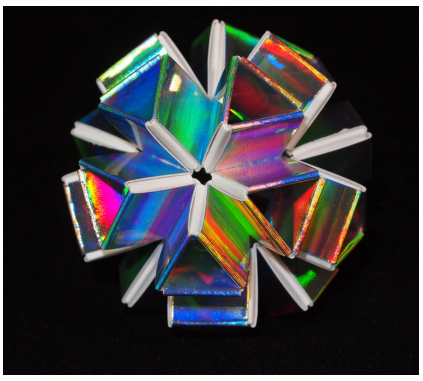
Variations on an Icosahedron

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