



*V³: a newsletter for the space of alumni
and friends of mathematics at UW-Madison*

JULY 2018



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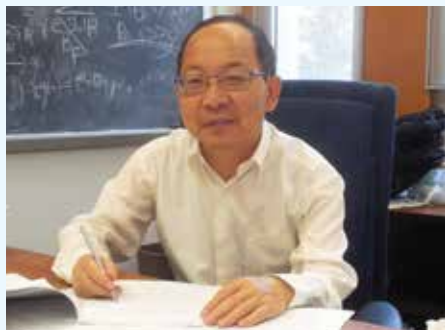
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A Word from the Chair



Welcome to the 2018 edition of the Van Vleck Vector.

It has been an exciting year in the Math Department. Gloria Mari-Beffa stepped down as chair in January to become our Associate Dean for Natural, Physical and Mathematical Sciences! Mari-Beffa has served as our very effective chair since 2014, and we are proud and excited to have her in the Dean's office.

My first semester as chair has been exciting to say the least, from many awards, to watching our junior faculty get tenure, to developing a strategic outlook for the future.

Our research faculty continues to receive numerous honors year after year, and this year is no exception. We've always had excellence in our faculty and staff and this year's awards show how bright we shine. In fact, we have more Simons awards winners than most other

universities (three!), tying Cornell and University of Michigan.

Our large lecture courses continue to evolve as we continue to explore ways to build out the active learning changes we've brought to Math 221 (Calculus 1) to our other calculus courses. Students are more engaged and learn better when they have more interaction with the professor and among themselves, having had the opportunity to preview the core content before class. The change from lecture-driven to more participatory is even seen as our TAs present in discussion; there, too, the problems are discussed in small groups, and not at a front blackboard, to make problem solving more hands-on and understandable.

This fall, we hosted a conference on redistricting that engaged with our community and explored new approaches to the old question of how to have a fair democracy. We also reached out to our young students with the expansion of the Math Circles program, spearheaded by the phenomenal work of Juliette Bruce, who won a Campus Excellence Award for her efforts. We again hosted the Mega Math Meet this past May to extend the appreciation of math throughout our state.

The Math Department has been pondering directions to pursue mathematics in the future. We were one

of twelve recipients in funding from the National Science Foundation to develop an Institute for Foundations of Data Science (IFDS). This will serve as a way to integrate math, statistics, and computer science to formulate new approaches to problems in data analysis, fitting with a broader UW-Madison agenda for data science research.

Sadly, there have been some losses in the mathematics family this year. Ed Fadell, Sufian Hussieni, and Hiroshi Gunji all retired years ago but will always be remembered for their research, their warmth, and their teaching over many years. Read more about them on page 13.

We are happy to hear from our donors of their memories of Madison, and we invite all of our alumni to return to visit. The University of Wisconsin continues to be a special place to learn and grow and appreciate all that we hold dear. We are very grateful to have such a talented group of mathematicians working together to make our mark on the UW, the state, the nation, and the world.

On, Wisconsin!

Tonghai Yang
Department Chair



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NSF Funds New Data Science Institute

UW-Madison was one of the recipients of 1.5M in funding from the The National Science Foundation (NSF) for twelve Transdisciplinary Research in Principles of Data Science (TRIPODS) projects.

This new UW project will bring together the statistics, mathematics, and theoretical computer science communities to develop the foundations of data science. One of the co-PI's is Sebastien Roch, who worked with Qin Li, Jordan Ellenberg, and Nigel Boston to help develop the proposal for the Institute for Foundations of Data Science (IFDS).

IFDS will serve as a hub for

people across campus with expertise in mathematics, statistics, and computer science to explore new approaches to the formulation and solution of problems in data analysis, as well as to epitomize the possibilities of a collaborative approach to investigating fundamental issues in data science. IFDS will integrate with the broader UW-Madison agenda for data science research, creating a new home for research of a fundamental, theoretical nature. It will play a vital role in establishing graduate degree programs in data science and in outreach to industrial partners with interests in fundamental data science research.

A Message from Dean Karl Scholz

If spring is a time of hope and growth and new beginnings, then spring came early here in L&S. In February, we celebrated the grand opening of SuccessWorks, the new career center designed just for L&S students, now occupying a sleekly-designed space on the third floor of the University Bookstore. The event brought together students, alumni, state government representatives, UW System Regents, donors, and business leaders.

After the ribbon-cutting, Chancellor Blank told a packed room:

“This space is going to transform how we prepare liberal arts students for careers, and bring us that much closer to our goal of integrating career readiness into students’ experiences while they are here on campus.”

I hope that you share my deep gratification at those words. When we launched the L&S Career Initiative in 2014, we dreamed of a place where students from any of the college’s 62 undergraduate majors—and at any point in their university experience—could come to explore and build connections



From left to right: Chief Financial Officer of American Family Insurance Dan Kelly, UW–Madison Chancellor Rebecca Blank, L&S Dean John Karl Scholz, and SuccessWorks Executive Director and Associate Dean Rebekah Pryor Paré prepare to cut the ribbon to officially open SuccessWorks, a new career exploration center for L&S students. (Photo by Sarah Morton, College of Letters & Science)

between academics, personal interests, and professional skills.

I am proud of the education we provide in L&S and of the students we have the privilege of working with. I hope you share that pride. After all, it’s your success that we are building on.

Check out SuccessWorks online at careers.ls.wisc.edu to read news

coverage of our grand opening. And next time you’re on campus, stop by for free coffee! Staff love to network with alums and talk about our successes, challenges, and dreams for our students.

On, Wisconsin!
Dean Karl Scholz

Gloria Marí-Beffa appointed L&S Associate Dean

Gloria Marí-Beffa has been appointed associate dean for the natural, physical, and mathematical sciences in the College of Letters & Science at UW–Madison.

Marí-Beffa, a professor and former chair of the Math Department, began the post on January 5, 2018, the start of the spring semester. A specialist in Poisson geometry and integrability, Marí-Beffa grew up in Málaga, Spain, and earned her PhD in mathematics in 1991 from the University of Minnesota-Twin Cities. She joined the UW–Madison Math Department in 1997 as an academic staff member, then was promoted to associate professor in 2006, and full professor in 2010. She had been the department’s chair since 2014.

In addition to her outstanding scholarship and teaching, Marí-Beffa has helped the Math Department recruit and retain more female faculty than nearly any other major research university in the country. She has served as the chair of the equity and diversity committee in the College of Letters & Science and volunteered as a coordinator of a UW mentorship program that connects high school girls with undergraduate and graduate students in math and science majors.

While we will miss her leadership and presence here in the Math Department, we applaud her accomplishment and look forward to working with her in her new role.



MAKE A GIFT

To mail a donation to support the Mathematics Department, include the designation “Mathematics Annual Fund” in the check’s memo line. The check should be made payable to the UW Foundation.

Please send it to:
UW Foundation
U.S. Bank Lockbox
P.O. Box 78807
Milwaukee, WI 53278-0807

To make a secure gift online using your credit card, please visit <http://supportuw.org/giveto/math>.

If you have any questions or would like information on other giving options, please contact Rebekah Sherman at (608) 572-2077 or rebekah.sherman@supportuw.org.

UW Connections:

We asked donors to explain their connection to UW–Madison, and what compelled them to give to the Math Department.



I went to graduate school at UW–Madison from fall of 1971 to spring of 1973. I received a Master of Arts in Mathematics. In hindsight, it was a fascinating time to be in college—when our nation was fighting an unpopular war in Vietnam. I still remember being a teaching assistant for a first-year Calculus course taught by Professor Jim

Kuelbs. I am proud of my achievement at UW and displayed my UW diploma in my office. In 2001, I was working at the World Trade Center and on 9/11 the diploma was destroyed. I was a fortunate survivor, although I lost many dear friends and colleagues. I never attempted to replace the diploma—its absence remains a reminder. For me, my UW experience is now my memories of people and events—things that a terrorist cannot destroy.

After Madison, I started a career as a consulting actuary specializing in retirement plans. I continue to be a Fellow of the Society of Actuaries. I retired from Deloitte Consulting in 2015. Deloitte encouraged my support for the university with its matching gift program and their focus on business and mathematics and related fields. Now, I spend my time traveling, volunteering for my synagogue, teaching at a local university, and even working as an actuarial specialist for an audit firm. I met my wife Joan at UW–Madison (at Witte Hall) in 1971. She received a masters degree from UW–Madison in Education. Today, we have three children (Stefanie, David & Rachel—plus their spouses Scott and Tarah) and two grandchildren (Lena and Theia). THANKS for your interest in my journey.

Ira Kastrinsky, MA 1971



As an undergraduate at the University of Kentucky, I was totally spellbound by the amazing metamathematics of Kurt Gödel and Stephen Kleene. “Only God could prove such things! And they do it with a simplicity that anyone can understand,” I excitedly told my girlfriend, future wife, in 1967. Then,

within a year, I was sitting in a seminar led by Professor Kleene, on the ninth floor of Van Vleck. He was one of the great mathematicians of the 20th century, a kind and beautiful person and eventually a friend. His beautiful work determined my career. Nearly every day, I think back to my years at Wisconsin’s spectacular university and the beautiful education it provided to me. This has been a gift that far surpasses any lottery, and I was the winner.

I am a retired Professor of Mathematics, at the University of South Florida, Tampa (USF). I served USF as Chairman of Mathematics in the 1990s. Before that, my career took me to University of Texas, San Jose State University, ATT Bell Labs, and Army Intelligence at Fort Monmouth.

At a time when death seemed near I allocated a modest \$25,000 to UW’s Department of Mathematics. Then when health returned I began paying it off \$1,000 at a time. Still, it would take millions to do justice to the gift I received at UW.

W. Richard Stark, PhD 1975

The Math Department was very welcoming to me even though, for the first thirteen years, I was on leave from it to the Math Research Center, at a time when some Math Department members were troubled by the MRC. Eventually, the department even put me up for two professorships. My recent donation, supplying part of the emeriti matching fund, was my way of saying ‘thank you’ to the department.

Carl de Boor, Professor Emeritus
Winner, National Medal of Science in
Mathematics and Computer Science



My wife Helena and I feel grateful to the Math Department for helping us, refugees, start productive lives in a new country. I arrived to study for my PhD at the Math Department in September 1968, a month after the Soviet Union invaded Czechoslovakia, the country

where I grew up. I landed in New York with \$18 in my pocket. Fortunately, Professor Kleene, who, on the basis of Professor Mostowski’s recommendation, offered me a research assistantship, wired to the airport \$100 so I could buy bus fare to Madison. He and his wife hosted me at their home and helped me find an apartment. When Kleene introduced me to the chair of the department, Professor Nohel, I was surprised that he greeted me in my native language: Czech! Because my research was in ultrafilters, Professor Keisler was my PhD advisor.

My wife Helena, a refugee after the invasion in London, was able to join me a year later and Professor Nohel engaged her as a technical typist because of her typing skills coupled with two years of mathematics at the Charles University in Prague. A year later I finished my PhD thesis and Keisler’s recommendations yielded offers of lectureships at Yale and Berkeley. After two winters in Madison, I chose Berkeley (where John Addison with PhD from Wisconsin was the chair). And my wife, because of her technical typing experience, got a similar position at the chemistry department at the university.

We had it made! Thanks to the initial supportive environment of the Math Department, within two years in a new country we were fully employed in fields which we liked. I went from Berkeley to the University of Washington then to Boeing, then to Amazon, and now I am in an active mathematical retirement.

Miro Benda, PhD 1970

Student Spotlights



Polly Yu grew up in Vancouver on the west coast of Canada. She completed her undergraduate studies at the University of British Columbia, where she spent time in both the chemistry and math departments, and where she received several NSERC research awards. Her undergrad thesis concerned computational and experimental cold chemistry, particularly trying to cool down a beam of hydrogen atoms to near standstill. After graduation, she enrolled in a math program at the University of Waterloo intending to learn more about quantum mechanics. After learning about C^* - and operator algebras at Waterloo, she came to UW–Madison to pursue her PhD. She works in applied mathematics, mathematical biology, and biochemistry under the direction of Gheorghe Craciun. She holds an NSERC postgraduate research scholarship.

Polly studies reaction networks. Molecules in an object interact chemically, cells in our body interact through biological processes, and animals in a population interact through reproduction and predation. These interactions form a large network and give rise to the dynamical systems at the heart of Polly's research. For example, given a population R of rabbits and a population F of foxes both living in the same environment, we may model their populations in a simple model where, over time, rabbits reproduce via a rule $R \rightarrow 2R$, foxes eat rabbits to survive via a rule $R + F = 2F$, and foxes die after living out their natural lifespan, indicated by the rule $F \rightarrow 0$. Thinking of a point (R, F) in the plane as a possible pair of population sizes, the rules move the integral lattice around. Adding some assumptions to the model, such as constraints on the “reaction time,” one may extract from all of this an ordinary differential equation and associated dynamical system. Part of Polly's research is devoted to steady states of these systems, i.e., are there populations that are preserved under the rules? If so, are these stable situations, i.e., do small changes in the population lead to extinction or drift back to equilibrium?

In addition to her research she has, since January 2016, served as the coordinator of Women in Mathematics at Wisconsin, which in addition to providing support for the women in the department, hosts a lecture series, does outreach to the broader mathematics community, and provides mentorship to women and girls of all ages.



Moisés Herradón Cueto was born in Madrid, Spain, the son of two doctors in chemistry who encouraged him to learn math and science from childhood. In the 5th grade, his parents suggested he participate in a local math competition, thus introducing him to a group of teachers running a program to teach “cool math” to middle schoolers. Throughout high school these types of programs and competitions crystallized his desire to be a mathematician.

Moisés majored in math at the Complutense University of Madrid, and received a fellowship from the savings bank La Caixa funding two years of graduate school in North America. The following year, he applied for graduate school while obtaining a Master's from the Autonomous University of Madrid under the direction of Andrei Jalkin. His master's thesis concerned Grothendieck's dessin d'enfants, or “children's drawings,” related to moduli of algebraic curves and Galois theory. This master's thesis became Moisés's first research paper, “An explicit quasiplatonic curve with non-abelian moduli field,” in which he constructs a regular dessin d'enfant whose field of moduli is not an abelian extension of the rationals, and which appeared in *Revista Matematica Complutense*.

Since 2014, Moisés has been a PhD student at UW–Madison, working under the direction of Dima Arinkin.

In high school we are first exposed to calculus and our first “differential operator:” the derivative of a real valued function. As we move forward in our studies, we encounter partial derivatives, then derivatives on manifolds, and as we climb higher we see differential operators showing up in many an abstract setting. In the higher levels of abstraction, one encounters the theory of D-modules, which are certain algebraic structures whose coefficients are differential operators (imagine formally manipulating derivatives without any concern for any underlying geometry). Using this theory, one may bring to bear techniques from analysis when studying algebra and algebraic geometry.

Now, often, when confronted with a real world problem, the relevant data given to us is discrete, rather than continuous, and our techniques of differential calculus are not immediately relevant. We may be interested in the behavior of change in a quantity, but differential equations are of no use due to discreteness. It is here that we turn to “difference equations,” which are more relevant to discrete change. Moisés's research is concerned with developing, in analogy with the theory of D-modules, the theory of “difference modules,” which replace the differential operators in a D-module with difference operators. Despite the fearsome reputation of these abstract subjects, Moisés is attracted to the “down to earth” nature of difference modules and their immediate connection to Geometry.

UNDERGRADUATE SPOTLIGHT.



When **Rodrigo Smith** arrived to be interviewed for this piece, he had just come from serving on a panel at an event for high school students. He is full of energy, and discusses mathematics with refreshing enthusiasm.

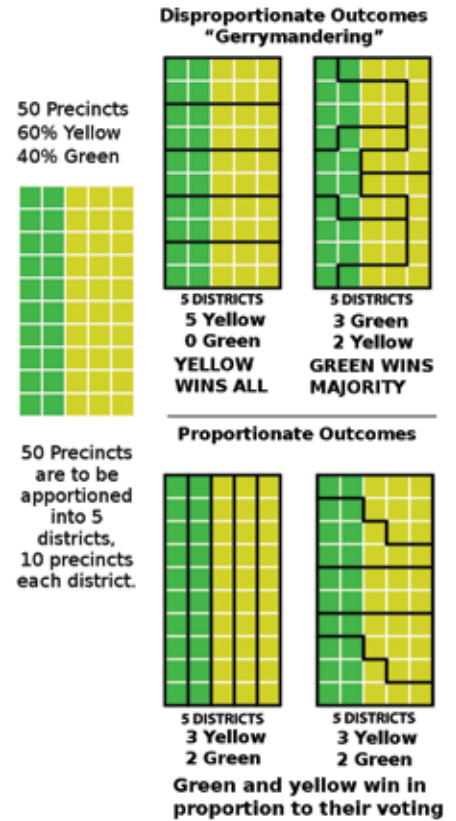
For Rodrigo, it seems that the life is often taken out of mathematics, and he firmly believes that math can be explained to the layman without all of the extensive apparatus of formal mathematics. Tutoring middle school

continued on page 13

The Mathematics of Redistricting



Gerrymandering: drawing different maps for electoral districts produces different outcomes



The snarled, jagged, seemingly random outlines of any political district are supposed to reflect a method for identifying the most reasonable division of our populations into roughly equal segments, in order to reflect sufficient and equal political representation. However, it has become a battlefield due to the political divide we find ourselves in, and a hot topic among many mathematicians who believe that there should be a way to use geometry and topology to give more fair and impartial apportionment.

In fall of 2017, the Math Department partnered with Tufts University to host a satellite conference on the Geometry of Redistricting. Running October 12–16, the first two days were open to the public, and offered speakers from many areas of expertise across campus, such as law, political science, applied population science, and of course, math. 200 people participated in these open sessions.

During this time, the current methods used to draw districting lines were discussed as well as the resulting issues when districting lines were poorly thought out or flat-out biased in their jurisdiction. Wisconsin features

prominently in these discussions due to its own court case, *Gill vs. Whitford*. The case focuses on a redrawn district map in Wisconsin in 2011, which was seen by many to be extremely partisan, and blatantly favorable to the Republican party, who was behind the adoption of it. The US Supreme Court has accepted the case and will soon weigh in on whether changes in this manner are legal. The fact that the court is so often the arbiter of such disputes underlines the need for expert witnesses on equitable methods for drawing district lines.

The last two days of the conference were more focused on training expert witnesses for legal proceedings, holding workshops for mathematics educators, and holding a districting “hackathon,” exploring how computing can aid in analyzing GIS and other quantifiable data for use in advising on districting decisions. Attendance at these focused sessions was about 90 participants, a very good turnout.

¹Tufts University runs the [Metric Geometry and Gerrymandering Group \(MGGG\)](https://sites.tufts.edu/gerrymandr/), a nonpartisan organization conducting research and outreach on the mathematics of redistricting. <https://sites.tufts.edu/gerrymandr/>



Departmental Teaching Awards

In 2017-18 the departmental teaching awards were split in three different categories. We gave separate awards for students in their early career as teachers, and mid-career awards for more advanced students. We also made an award for outstanding service.

EARLY TEACHING AWARD
Michel Alexis, Geoffrey Bentsen, Benjamin Wright

SERVICE AWARD
Juliette Bruce

MID-CAREER AWARDS
Jingrui Cheng, Thomas Edwards, Eva Elduque, Robert Laudone, Liban Mohamed, Thomas Morrell, Tung Nguyen, Jiuya Wang

L&S TEACHING FELLOWS
Christian Geske was named a 2017 Letters & Science Teaching Fellow, and Robert Laudone was named as an alternate.

CAMPUS EXCEPTIONAL SERVICE AWARD
Juliette Bruce is a fourth-year PhD student in mathematics. She has taught classes in algebra, statistics and probability, and calculus. Additionally, she has held a non-standard teaching assistant position with the Madison Math Circle, an outreach program sponsored by the Math Department, since spring 2016. Math Circle aims to present a series of mathematically based activities aimed at interested middle school and high school students, with the goal of providing a taste of exciting ideas in math and science.

"One aspect of teaching for the Madison Math Circle that I really enjoy is taking the University of Wisconsin-Madison beyond the bounds of campus, making our learning community open and inclusive to as many people as possible," Juliette said.

Daniel Erman, faculty organizer of the Math Circles program, notes "I am astounded by the quality and quantity of Bruce's service activities. Her work with the Madison Math Circle directly touches hundreds of K-12 students each year; her work on recruitment, mentoring, and professional development has affected over 100 graduate students in our department; and her work on LGBTQ+ and diversity issues has a campuswide impact. She is well deserving of this honor."

Graduate Awardees photo: Back, L-R: Thomas Morrell, Liban Mohammad, Robert Laudone, Ben Wright, Thomas Edwards. Front, L-R: Tung Nguyen, Michel Alexis, Geoffrey Bentsen, Eva El Duque, Jingrui Cheng

Graduate Student Awards 2018

Each year the department recognizes several students for especially significant contributions in research and for outstanding performance as teaching assistants.

EXCELLENCE IN RESEARCH AWARDS

Jingrui Cheng, a student of **Mikhail Feldman**, works on nonlinear partial differential equations. In his thesis he studied the semi-geostrophic (SG) system, a large-scale model of atmospheric flows. His results represent progress in several long-standing open problems in this area: he obtained the first result on the SG system with variable Coriolis parameter, which is a physically realistic case, and he defined weak solutions for the SG system with moist convection in a vertical column and proved their existence. In both cases, previous approaches cannot be applied, and Jingrui developed new techniques. He also studied a free-boundary problem for the SG system, and proved existence of Lagrangian solutions.

Ruiwen Shu, a student of **Shi Jin**, works in applied mathematics. He has made significant advances in uncertainty quantification for kinetic equations, including developing an efficient algorithm for multi-dimensional multiphase flows with random uncertainties, establishing regularity in the random space of the system, providing sparse grid methods for multidimensional random space, and obtaining the first set of regularity results for Landau damping with random inputs.

Jiuya Wang, a student of **Melanie Matchett Wood**, works in number theory. Malle's conjecture is a 16-year-old conjecture, central in arithmetic statistics, that says how many number fields there are with various Galois groups. Jiuya proved this conjecture for infinitely many new Galois groups. Before Jiuya's work, a secondary term for this counting was known for only a single Galois group, and Jiuya has proven secondary terms for infinitely many groups.

Jay Yang is a student of **Daniel Erman** whose thesis involves the use of random models in commutative algebra. He has written three papers in the area. One of these uses a model based on Erdős-Renyi random graphs to produce the first known examples of a behavior on asymptotic syzygies that was conjectured by Ein and Lazarsfeld. A second paper developed a new computational technique for computing Veronese syzygies, and used the resulting to introduce a number of striking new conjectures.

Dongxi Ye, a student of **Tonghai Yang**, works in number theory. He is a versatile researcher with 16 research papers published already, some single authored and some in collaboration. In his thesis, he worked on Borcherds products and their CM values. He then used the results to find cool formulas for $\bar{\omega}$.

JOHN NOHEL PRIZE IN APPLIED MATHEMATICS

John Nohel was a professor in the Math Department at UW-Madison from 1961 to 1991. The prize recognizes a graduate student who writes an outstanding PhD thesis in applied mathematics at UW-Madison.

Zachary Charles was a PhD student of **Nigel Boston**, working on applied algebra, machine learning, data science, optimization, and power systems. He is currently a postdoc in the UW ECE department working with **Dimitris Papailiopoulos**. His 242-page thesis found many novel ways to inject sophisticated mathematics into hot topics of engineering and computer science, such as machine learning and optimization.

ELIZABETH HIRSCHFELDER SCHOLARSHIP

Elizabeth (Stafford) Hirschfelder (1902-2002) received a PhD in mathematics at UW-Madison in 1930 and taught for almost twenty years in the Math Department. In the 1990s, she established a scholarship fund for graduate women in mathematics, chemistry, and physics. In 2017, Hirschfelder scholarships were awarded to three students in the Math Department.

Eva Elduque is advised by **Laurentiu Maxim**. She studies the topology of complex algebraic varieties by using techniques from both topology and algebraic geometry. For example, in one of her research papers she computed global topological invariants of a complex arrangement complement in terms of combinatorial data associated with the singular points, and obtained important topological applications (such as distinguishing non-homeomorphic homotopy equivalent arrangement complements). In a different direction, she gave an entirely topological proof of the signed Euler characteristic property for the intersection homology of closed subvarieties of abelian varieties.

Di Fang is advised by **Shi Jin**. She has provided the first uniform convergence proof for time-splitting spectral schemes for mixed quantum-classical system, the Ehrenfest system, and with Jian-Feng Lu, provided an efficient path integral based stochastic method for non-adiabatic quantum systems.

Jiuya Wang worked with **Melanie Matchett Wood**. A description of her research appears earlier in this story.



Math Talent Search News

Talent Search Winner Graduates after Making Big Impression



Thomas Hameister, winner of the 2014 Wisconsin Math Talent Search competition, has graduated from UW–Madison as a math major. Originally from Neenah, Wisconsin, Thomas has really been making his impact known in the Math Department.

- He received a 4.0 in all of his math courses.
- He worked as a grader for the current Math Talent Search competition.
- He was one of the rare undergraduates who was invited to give a department seminar in combinatorics, prompting Paul Terwilliger, who runs that seminar, to note, “I believe he’ll be the president of the AMS (American Mathematical Society) someday.”
- He took and placed nationally in the Putnam Exam in 2014, 2015 and 2016.
- He has worked with Prof. Gloria Mari-Beffa as an Undergraduate Research Scholar, along with two other undergraduates, studying a research question related to both Lorentzian and Galilean geometry and how the geometry of twisted polygons relates as the speed of light goes to infinity.
- He won first prize in the 2016 Undergraduate Math Competition.
- He received awards from the department for his work
2017: Violet Higgitt Frank Scholarship
2018: Dowling Scholarship

In 2014, Thomas said, “I definitely want to go as far in the field as I can, academically,” he says. At this point, he is thinking less about what he’ll do for a career than about the “amazing opportunity to study what I love.” This fall he’ll start a PhD program in mathematics at the University of Chicago, where he intends on studying number theory.

Mathematics Undergraduate Scholarship Awards

THEODORE HERFURTH SOPHOMORE SCHOLARSHIP

Patrick Dougherty

DAVID H. DURRA SCHOLARSHIP

Daniel Griffith

FLORENCE BROOKS USHER SCHOLARSHIP FUND

Catherine McSorley

GEORGE ENFIELD FRAZER JR. SCHOLARSHIP

Weihong Li

GERALD W. AND TUI G. HEDSTROM SCHOLARSHIP

Tenten He

MERLIN E. SILVERTHORN SCHOLARSHIP

Lauren Laufman

2018 TALENT SEARCH WINNER CHOSEN



The winner of the 2018 Math Talent Search is **Owen Hunt**. Owen is from Hartland, Wisconsin, and is a senior at Arrowhead High School. Owen has participated in prior Math Talent Search competitions and had already chosen to attend UW–Madison in the fall. Owen wins the Talent Search Scholarship, which is \$6,000 over four years to attend UW–Madison. We are very pleased that Owen has been awarded this prize and look forward to seeing him next year.

WHAT IS THE MATH TALENT SEARCH?

The Math Talent Search, which began in 1963, emphasizes proofs, rather than numbers. Participants receive five sets of problems via email over the course of the school year (each set has five problems). Top scorers are invited to the Honors Day ceremony held at UW–Madison’s Van Vleck Hall. Before the festivities, however, students must complete the final challenge: a proctored exam. The top scorer wins the scholarship to attend UW–Madison. Want to learn more? <https://math.wisc.edu/talent/>

Undergraduate News

Goldwater Scholars Named

One AMEP student, **Roger Waleffe**, has been named a Goldwater Scholar, and another, **Jason Mohoney**, has been named with an Honorable Mention. AMEP is an interdisciplinary bachelor of science degree program focusing on math, physics, and an area of engineering. Roger and Jason are juniors and happen to also be roommates.

Roger Waleffe, when asked about his favorite Math courses, mentioned Math 513 (Numerical Linear Algebra) and Math 514 (Numerical Analysis). “I like integrating math with computer science, and both courses were highly applicable to my research interests. For example, the variety of algorithms developed in 513 to work with matrices and systems of equations are all widely used throughout machine learning. Additionally, in my physics undergraduate research I have numerically solved differential equations and done lots of polynomial interpolation, both subjects in 514. I enjoyed both courses, and would recommend them to anyone studying the applied sciences.” Roger hopes to join a leading fusion energy



Roger Waleffe and Jason Mohoney

company and work with a team of researchers to develop new technologies for plasma reactors.

Jason Mohoney mentions that his favorite course was Math 321 (Applied Mathematical Analysis). “The coursework was interesting and challenging, which made completing the work extremely rewarding. My knowledge of vector calculus from Math 321 has been especially helpful in [studying] electricity and magnetism, and fluid dynamics courses. My strong math background is what allowed me to become an effective learner and problem solver.” Jason would like to conduct research in nuclear fusion and teach at the university level.

Goldwater Scholarships provide up to \$7,500 a year to help cover costs associated with tuition, mandatory fees, books, room, and board. Nominated students who do not receive a scholarship but who show particular promise will be recognized with an Honorable Mention. Students who receive an Honorable Mention do not receive financial support.

COMAP COMPETITION RESULTS

This year we fielded a department record of eight teams for the COMAP Mathematical Contest in Modeling. In this contest, teams of up to three undergraduate students race to interpret an open-ended real-world problem, develop a mathematical description of the system, and explore the strengths, weaknesses, and results of their model—all in less than 96 hours. Last year 8085 teams from 788 institutions in eight countries participated in the contest.

The team of **Kesong Cao**, **Shirui Chen** and **Yuhan Liu** did particularly well, earning a Meritorious ranking (top 10%) with their paper “Assessment of Renewable Energy Usage: A Combined Model of Multiple Linear Analysis and Grey Method.” **Yongnan Che** and **Hanyang Zhang** were one of three Madison-based teams that received an Honorable Mention ranking (top 40%) for their paper “What Language Will Your Descendants Speak in 50 Years?—Bayesian Game on the Interactions between Languages.”

Participation in the contest helps students appreciate the incredible complexity of real-world problems and how a tremendous amount of work goes into even finding the right mathematical question to ask. Problems are unlikely to have a unique solution, so clarity, analysis, and design are of critical importance. The faculty advisor for the contest is **Professor Saverio Spagnolie**, and the students enjoyed extra mentoring this year by research associate **Amy Cochran**.

PUTNAM EXAM RESULTS 2017-2018

The Putnam Exam, offered by the Mathematical Association of America, is the premier American math competition for undergraduate students. It is given each year on the first Saturday in December. The exam consists of 12 problems, six in the 3-hour morning session and six in the 3-hour afternoon session. Each problem is worth 10 points, so the maximum score is 120. National winners usually get around 100 points. The median score is generally around 0-2 points. This is a difficult exam with many interesting and fun problems.

The exam was taken by 4,638 students from 575 institutions in December 2017. The exam was quite tough: the median score was 1 out of 120, the top score was 89.

16 UW students took the exam. Our team placed 13th nationwide: **Sivakorn Sanguanmoo**, **Xiixin Li**, and **Daotong Ge**.

Individually, the results were just as impressive: an Honorable Mention (**Sivakorn Sanguanmoo**), 39th rank nationwide, one student in top 200 (**Daotong Ge**), and two more in top 500 (**Xiixin Li** and **Liding Yao**).

Faculty News

Congratulations to **Dima Arinkin, Jordan Ellenberg, and Sebastien Roch** in being named **Simon Fellows**. The Simons Fellows programs in both mathematics and theoretical physics provide funds to faculty for up to a semester-long research leave from classroom teaching and administrative obligations.

Appearing on the PBS program “Nova,” UW–Madison professor and math expert **Jordan Ellenberg** explained how understanding simple facts about probability can help people in their everyday lives. “Prediction by the Numbers” aired February 28, 2018.

Autumn Kent and Samuel Stechmann were appointed as **Vilas Associates** through the university’s prestigious Vilas Associates competition. The Vilas Associate appointment is awarded to faculty with new, ongoing, significant, and high-quality research. The Divisional Research Committees of the Office of the Vice Chancellor for Research and Graduate Education chooses the competitive recipients based on a detailed proposal. The appointment provides summer salary for two summers and \$12,500 in flexible research funding for two fiscal years.

Shi Jin has been chosen as an Invited Speaker at the next **International Congress of Mathematicians (ICM)**, in August 2018 in Rio de Janeiro, Brazil.

Two mathematicians have proved that two different infinities are equal in size, settling a long-standing question. Their proof rests on a surprising link between the sizes of infinities and the complexity of mathematical theories. Our own Professor Emeritus, **Jerry Keisler**, created “Keisler’s order” in 1967, which was used to make the connection.

Assistant Professor **Qin Li** has been awarded an **NSF Career Grant**. Her application on Applicable Kinetic Computation with Boundaries and Rough Media will start September 1, 2018.

Melanie Matchett Wood has been named as one of the **Top 50 Women in STEM**, as published by TheBestSchools.org. She has also been named as a **Vilas Distinguished Achievement Professor**. These professorships are awarded only to those who “possess unusual qualifications and promise, having been recognized nationally and internationally for the quality of their research.” The title may be carried for the duration of her career in Madison. This is truly an accomplishment, as Melanie was awarded the Vilas Early Career Investigator award just last year. It is a testament to Melanie’s research that she has gone from the junior to the senior award in just one year.

Andreas Seeger has been awarded a **Humboldt Research Award** by the Humboldt Foundation. The award is granted in recognition of a researcher’s entire achievements to date to academics whose fundamental discoveries, new theories, or insights have had a significant impact on their own discipline and who are expected to continue producing cutting-edge achievements in the future.

The **American Mathematical Society** has announced that **Timo Seppäläinen** was named as a Fellow in 2018. The Fellows of the American Mathematical Society program recognizes members who have made outstanding contributions to the creation, exposition, advancement, communication, and utilization of mathematics. Timo was nominated for his contributions to probability.

Congratulations to **Lu Wang** on her award of the **Vilas Faculty Early Investigator Award**. The award is meant to recognize research and teaching excellence in faculty who are relatively early in their careers.

Staff News

John Heim, IT system administrator, has been awarded the **2017 Martha Casey Award for Excellence**. This competitive campuswide award celebrates the “unsung hero” of many departments and John certainly qualifies. John has developed several applications to smooth student transitions and administrative processes since he started in 2005. This is all the more remarkable because John is blind. He uses a screen reader to help in his programming and server administration duties, and has the assistance of his faithful guide dog, McKee, in his daily life.

Gabi Meyer has been awarded a **College of Letters & Science Academic Staff Mid-Career Award**. This award, given to members of the L&S academic staff with eight or more years of service, carries a \$3,000 cash award. These awards are granted to individuals who demonstrate outstanding performance in their positions, leadership and service beyond their positions, and substantial professional competency and promise of continuing contributions. Gabi is a senior lecturer, involved in teaching courses at multiple levels, managing the Matlab drop-in tutoring program, and is an accomplished mathematical crochet artist.

Department Updates

New Faces in the Math Department



Michael Brown joined the Math Department as a Van Vleck Assistant Professor in the fall of 2017. He received his PhD at the University of Nebraska under Mark E. Walker in 2015. He is interested in K-theory, commutative algebra, and (noncommutative) algebraic geometry.



Mihaela Ifrim joined the Math Department as an Clare Luce Boothe Assistant Professor in fall of 2017. Previously, she had been a Simons Postdoctoral Fellow at UC Berkeley working with Daniel Tataru. Before coming to Berkeley, she was a graduate student at UC Davis; her PhD adviser was John K.

Hunter. Her research interests are nonlinear dispersive equations (water-wave equations and related dispersive models), fluid mechanics, elasdodynamics, harmonic analysis, and general relativity



Theresa Neisius will be handling payroll and human resources for the department. She joins us after five years at IDM Hospitality, a company that managed boutique hotels. She has four children; one just graduated from UW–Oshkosh, one will be a senior at UW–Whitewater, one is in high school, and one is in middle school. In her spare time, she is always running children to sporting events, but loves to read and work out. She lives in Middleton.



Joris Roos joined the Math Department as a Van Vleck Assistant Professor in fall of 2017. He received his PhD at the University of Bonn, Germany, under Christoph Thiele in 2017. He is interested in harmonic analysis on Euclidean spaces, particularly time-frequency analysis, singular and maximal Radon transforms, and oscillatory integrals.



Michael Wang is our new chair's assistant. Michael graduated from Madison College in 2013 with a journalism certificate. He worked at a grocery business for 11 years, working his way from clerk, to assistant manager to manager, but a neck injury led to a career change. In his spare time, he enjoys watching baseball and football. He's a fan of the Brewers, Badgers, and Packers, and has probably been to more than 100 Brewers games since 2000. He just bought a house and is enjoying turning it into a home with his girlfriend Bre.



Yingwei Wang joined the Math Department as a Van Vleck Assistant Professor in the spring of 2018. Before coming to Madison, he received his PhD from Purdue University in 2017, supervised by Jie Shen. His research interests lie broadly in the fields of numerical analysis and scientific computing in general. More specifically, his research goal is to develop efficient spectral and high-order numerical methods for partial differential equations.

Retirements

Professor Amir Assadi has retired after 32 years of service. We wish him well in this new period of his life and thank him for all his contributions to the Math Department and UW–Madison.

Jack Carson, longtime faculty associate, retired in May 2018. He served since 1998 with the Tutorial Program.

Joan Wendt, who worked as our chair's assistant from 2004-2017, retired in 2017. We greatly miss seeing her smiling face in the halls of Van Vleck Hall. In her retirement, she looked forward to getting to know her new granddaughter and tending her garden.



Hear **Elizabeth Hirschfelder** talk about teaching math at UW–Madison during the Depression and WWII.

Thanks to MINDS @ UW for making this audio available!

<https://go.wisc.edu/v2j8rf>

Alumni News Page

Erica Flapan (PhD, 1983), teaching at Pomona College, has been named as the new editor of the *Notices of the American Mathematical Society*, a three-year term beginning in 2019.

Kathryn Hess (B.Sc. 1985) was interviewed in the March 2018 issues of the *Notices of the American Mathematical Society* on her career as a mathematician. She received her PhD from MIT in 1989 under David Anick. She was named a Fellow of the American Mathematical Society in 2017, and currently is an associate professor at École Polytechnique Fédérales De Lausanne.

Theresa Hone (MA, 1973) is a consultant software engineer at Inter-American Development Bank in Washington, DC, having developed and still supporting the system for managing and disbursing development loans and grants to countries in this hemisphere.

Ben Kane (PhD, 2007, Advisor: Tonghai Yang) has won the prestigious Hong Kong Mathematic Society Young Scholar Award. He is cited for his fundamental contributions to number theory, especially on the theory of meromorphic modular forms and polar harmonic modular forms. As two of many beautiful applications of his joint work with Kathrin Bringmann, the authors proved a Ramanujan type formula for the Fourier coefficients of any meromorphic modular form of negative weight, and gave an explicit construction of meromorphic modular forms of weight 0 as sums of polar harmonic forms. Ben is at Hong Kong University. Ben was one of three young mathematicians cited, along with Eric Chung of Chinese University of Hong Kong, and Xianpeng Hu of City University of Hong Kong.

Song Sun (PhD, 2010; Advisor: Xiu-Xiong Chen) has become an associate professor at UC-Berkeley. He was awarded the Sloan Research Fellowship and was an invited speaker at ICM 2018 (Brazil).

Robert L. San Soucie (PhD, 1953; Advisor: Bruck) died March 13, 2017, just shy of his 90th birthday. He was born in Adams, Massachusetts, to Leo and Ora (Sturm) San Soucie. He is survived by his wife, Pat, sons Rick and Marc, daughter Mary Frances, a brother, William, seven grandchildren, and many nephews and nieces. Bob joined the Navy in late 1945, serving in the Pacific Ocean on the USS Kenneth Whiting, starting just a few months before the end of the war. He then participated in Operation Crossroads, where the atomic bomb went through further testing. Bob excelled in school. He graduated from the University of Massachusetts in 1949, and then, on scholarships and teaching fees, earned his doctorate in Abstract Algebra in 1953 at the University

of Wisconsin, where he met Mary Patricia Molm. He and Pat were married in September 1953 and started off to Eugene, Oregon, where Bob had a position teaching mathematics. Four years later he left the academic world and moved to Buffalo, New York, for industrial pursuits with Sylvania Corporation. After a time the family, now numbering five, moved to St. Louis, Missouri, where Bob took an executive position with Emerson Electric. His work at Emerson Electric found him traveling the globe, visiting with defense departments in countries all over the world. In the 1970's the family moved to New Jersey, where Bob worked in investment banking at Donaldson, Lufkin & Jenrette. He served on the Board of Sealed Air Corporation for decades. Later he owned his own small business. Bob and Pat moved back to Oregon from New Jersey in the late 1990's, living first in Clackamas County and later in Hillsboro, where Bob passed away. Bob was most proud of his 63-year marriage to Pat, his three kids, and his doctorate, and loved the many family members and friends he knew in his life. Bob found joy in all the people that would come and pontificate with him, about any subject. Many will remember sitting around his kitchen table, discussing and dissecting topics large and small.

Rebecca Senkowitz (MA, 2004) has received a NISOD teaching award. She is an associate professor (Mathematics Department) at the Community College of Allegheny County in Pittsburgh, PA.

Congratulations to **Balazs Strenner** (PhD 2015), winner of the **Mary Ellen Rudin Award in Topology**. Balazs is currently a Hale Visiting Assistant Professor at Georgia Tech

Li Wang (PhD, 2012; former student of Shi Jin) will join the faculty in the Department of Mathematics, University of Minnesota, after her postdoc position at UCLA and a faculty position at SUNY-Buffalo.

In Memoriam



Ed Fadell

Professor Emeritus Ed Fadell passed away on January 11, 2017, at age 91 (almost 92). After graduating from OSU with a PhD, he went to Harvard as an assistant professor for three years before coming to UW–Madison in 1955. He stayed at Madison as both a distinguished researcher in algebraic topology and an award-winning teacher until his retirement in 1994. He taught another five years before he fully retiring. He also loved music.



Hiroshi Gunji

Professor Emeritus Hiroshi Gunji passed away recently from a stroke. He had retired in 2001. He was a dedicated teacher of calculus, and not many semesters went by when he wasn't lecturing in a calculus course.

Hiroshi received his PhD from Johns Hopkins University in 1962, under the direction of Jun-ichi Igusa. His thesis was entitled “Some properties of curves of genus 2 representing singular points of variety of moduli.” He spent two years at Cornell University, then

two years at the University of Saskatchewan before coming to UW–Madison in 1966 as an assistant professor. Hiroshi did important research in number theory and had four PhD students during his tenure in Madison. He had a tremendous impact on our graduate program as chair for many years of the graduate admissions committee.

One incident which shows how much Hiroshi was admired by his students occurred in a calculus course in which he was lecturing. Hiroshi was using a microphone with a wire attached and it would often get wound up around his feet. Students took up a collection to buy a wireless microphone, distributing leaflets which contained the words “Free Professor Gunji!”

For many years Hiroshi was an amateur artist; he and Josh Chover were close friends and often painted together.

Sufian Husseini

Sufian Husseini passed away on December 30, 2017, in Salem, Oregon, after months of health struggles. He was a faculty member from 1961 until his retirement in 2001.

Sufian obtained his PhD at Princeton under Norman Steenrod and was an instructor at MIT before moving to Madison. His research was primarily in algebraic topology, on topics such as loop spaces and configuration spaces. He established a long term collaboration with Ed Fadell (also a UW–Madison colleague) and together they wrote a number of beautiful and influential papers exploring applications of algebraic topology to diverse topics in analysis, manifold theory, economics, and mathematical physics. Their joint monograph *Geometry and Topology of Configuration Spaces*, published in 2001 by Springer, is a highly regarded reference.

Sufian was a source of knowledge and inspiration for students and faculty alike and known for his astute insight in mathematics and beyond. Together with his wife Barbara he generously hosted many mathematicians and contributed in important ways to our department for forty years.



Student Spotlights

continued from page 5

students twice a week, he tries to convey underlying ideas to students, rather than formality. He views mathematics as a fundamentally human endeavor, describing it in artistic terms, as an art form in which there is an “endless amount of paint to paint with.”

Rodrigo grew up on the south side of Chicago, and came to UW–Madison as a Posse Fellow. His interest in mathematics arose from his interest in physics, and he has a strong interest in the history of mathematics and the human element in our subject. With Naser Sardari, Van Vleck Visiting Assistant Professor here at UW–Madison, Rodrigo has been investigating Ramanujan graphs constructed by Lubotzky, Phillips, and Sarnak. Specifically, they have been studying algorithms to find short paths between points in these graphs. In the fall, he will return to Chicago to pursue a masters at DePaul University, with an eye on category theory, algebra, topology, and number theory, his current principal interests.

2018 GRADUATES



PHD GRADUATES

Peng Yu

Advisor: Tonghai Yang

William Mitchell

Advisor: Saverio Spagnolie

Jongchon Kim

Advisor: Andreas Seeger

Jeffrey Poskin

Advisor: Alberto Del Pia

Yu Li

Advisor: Bing Wang

Yang Yang

Advisor: Paul Terwilliger

Zachary Charles

Advisor: Nigel Boston

Jingrui Cheng

Advisor: Mikhail Feldman

Reese Johnston

Advisor: Steffen Lemp

Jiuya Wang

Advisor: Melanie Matchett Wood

Ruiwen Shu

Advisor: Shi Jin

Bae Jun Park

Advisor: Andreas Seeger

Dongxi Ye

Advisor: Tonghai Yang

James Brunner

Advisor: Gheorghe Craciun

MA GRADUATES

Ye He

Qixian Zhao

Xinru Li

Qianhui Wan

Zinan Wang

Ruida Tang

Lin He

Weixiang Jing

Chi Zhang

Yuzhen Cao

Jiaqi Cai

Xiaofei Gao

Mao Hong

Jacob Gloe

We asked our 2018 graduating students for an update on what will be next for them.

Samuel Berman (BS, 2018) has accepted a job as a financial analyst at JLL Real Estate in Chicago.

Eric Chan (BS, 2018) hopes to find a job.

Adam Christopherson (BS, 2018) will be entering the PhD program at Ohio State.

Aidan Combs (BS, 2018) will be entering the PhD program in sociology at Duke University.

Cory Cotter (BS, 2018) will attend graduate school at the University of Chicago for astrophysics.

Benjamin Hansen (BS, 2018) is the Founder of Bump Studios.

Evan Hernandez (BS, 2018) will be working as a software engineer for Google in Boulder, CO. His product area will likely be Google Earth.

Emma Krauska (BS, 2018) will be entering the PhD program in statistics at UW–Madison.

Cole Kunsman (BS, 2018) will be working for Zendesk as a Security Compliance Analyst in San Francisco, CA.

David Neiman (BS, 2018) will be entering the PhD program in statistics at UW–Madison.

Tyler Phelps (BS, 2018) will be working as a software engineer for Capital One in Washington, DC.

Kolbe Short (BS, 2018) is currently weighing a couple of job offers from global IT consulting companies and looks forward to working in data science in the tech industry.

Grigory Terlov (BS, 2018) will be in the PhD program in mathematics at University of Illinois-Urbana-Champaign.

Michael Tipping (BS, 2018) will be entering the Urban Teachers post-baccarlate teacher certification program.

Nicholas Visser (BS, 2018) will be working as an assistant scientist at PPD in Middleton, WI.

Jing Weixiang (MA, 2018) will be in the 2018 cohort of the MFE program at the UCLA Anderson School of Management.

Li Xinru (MA, 2018) will be entering the PhD program in industrial engineering at Penn State.

Chi Zhang (MA, 2018) will be entering UCSD as a PhD student in mathematics.

Zachary Charles (PhD, 2018) will be a postdoctoral researcher at UW–Madison.

Jingrui Cheng (PhD, 2018) will be the Simons Research Assistant Professor at Stony Brook University.

Jongchon Kim (PhD, 2017), a member of the Institute of Advanced Study in Princeton, NJ, will move to the University of British Columbia for a postdoctoral position.

Bae Jun Park (PhD, 2018) will be a research fellow at the Korea Institute of Advanced Study, in Seoul, South Korea.

Ruiwen Shu (PhD, 2018) will be doing a postdoctoral fellowship at the University of Maryland at College Park.

Jiuya Wang (PhD, 2018) will be the Philips Griffiths Research Assistant Professor at Duke University.

Yang Yang (PhD, 2018) will work in Quantitative Advisory Services at Ernst & Young, NYC.

We'd like to thank our donors for their support. Their assistance helps fund the activities that continue to make our department one of the top math departments in the country.
On, Wisconsin!

Samantha E. Abrams and Brian D. Cobb	Carol A. Costanza	Joan E. Hart	Marianne E. Miller and Jonathan T. Baer	Eric Sharkey
Mohammad H. and Homa Ahmadi	Evin J. Cramer	Craig S. and Joann T. Heberer	Jack Minker	Jonathan L. and Rhonda J. Shaw
Nancy L. and Tom Alar	Carol A. Currier	Shane C. Helland	Scott A. and Carissa L. Mitchell	Rebekah J. Sherman
Walter R. Albers	Bradley C. Czech	James P. Henderson and Jennifer L. Faust	James D. and Patricia D. Moore	Dawd S. and Nejiba S. Siraj
Kelsen P. Alexander	Yihong Dai	Bruce R. Henry	Christine E. and Robert F. Mortenson	John R. and Patricia Smart
David W. Allbritton	Bernard C. Daley	Eric E. Hestekin	Joan R. and Yiannis Moschovakis	Kirby C. Smith
David F. Appleyard	Carl S. and Nancy L. Davis	William R. Hintzman	Thomas A. and Mary C. Murray	Scott P. Snyder
Lucille D. and Norman J. Arendt	Carl-Wilhelm R. De Boor	Jesse T. Holzer	Mark E. Nadel	Kathleen A. and Philip L. Sobocinski
James E. Arnold	Geng Deng	PeiQing Huang	Scott K. Nagle	Neal W. Spellmeyer
Michael G. and Pamela E. Aschbacher	Barry E. DeZonia	Shane L. Hubler and Colleen E. Hayes	Caryn L. Navy	W Richard Stark
Paul C. Aspinwall and Bonnie Bruce	Joseph Doniach	Roger C. Inhorn and Victoria Masakowski	Joseph Nguyen	Gladys C. Steinberg
Christina A. Bahl	Paul Donis and Diane E. Wickland	Grant Izmirlian	Douglas P. Niebur	Gordon R. Stephenson
Andrew D. Bailey	Anne M. Dougherty	Larry W. and Sharon E. Johnson	George M. Nielsen	Elizabeth S. and Jeffrey D. Stroomer
Daniela Banu	Gregory P. Dresden	Warren P. Johnson	Tyler E. Odders	Timothy K. and Alexandra G. Swast
Robert C. Beach	Evan E. Driscoll	Robert A. Jones	Dennis V. and Mary C. Osimitz	Joseph P. and Vernell B. Theisen
Mary E. Beaumont	Tung H. Duong	Jonathan M. Kane and Janet E. Mertz	Randolph H. Ott and Katherine Ott-Warner	Thomas J. and Donna G. Thomas
Kathleen A. Beleckis	Jeanne B. Eberhardt	Ira G. and Joan G. Kastrinsky	Jayne A. Overgard	Maynard D. and Judith A. Thompson
Miroslav and Helena Benda	Robert K. Eckl	Scott W. and Lisa L. Kelley	Diana G. Palenz	Lowell H. Tonnessen and Mary L. Eng
Tracy L. Benton and William J. Bodden	Jordan S. Ellenberg and Tanya Schlam	Jo Ann and Duane T. Kexel	Larry R. and Carolyn C. Pantzer	Anna K. Totdahl
Sheridan and John R. Bentson	Elnur Emrah	Laura J. Knoll and Rob T. Striker	Lee Parsons	Richard G. and Susan Turner
Ethan J. and Kyra E. Berkove	Gernot M. and J B Engel	Richard J. Kos	Bambridge E. Peterson	Jerald H. and Kendra K. Tutsch
Suzanne M. Bernhardt	Steven M. and Lynn B. Entine	Leroy J. and Judith A. Krajewski	Edward L. Piper	Barbara J. Underberg
James W. Bisgard and Kathryn E. Temple	Joel Epanouri	Thomas A. Kuczmarzski	Daniel J. Prevenas	Douglas H. Underwood
Peter J. Blankenheim	Roger P. and Judith A. Erickson	Ila M. Kuestner	Ronald W. and Elizabeth N. Prielipp	Elizabeth K. and Christopher S. Vaden
Mark R. Boothby	Cavan C. Fang	Travis A. Kurth	Howard W. Pullman	Lorna R. Vazquez
Keith I. and Julie M. Boyd	Robert B. Feinberg	Christopher Kuster	Peng Qi	John D. and Sandra L. Vedder
Matthew G. Boylan	Jay J. Finst	Spencer M. Lagesse	Declan P. Quinn and Kari E. Shaw	Steve P. and Kathleen E. Verrill
Louis R. Bragg	Cary B. and Katrina Forest	Alfred P. Lehnen and Gwen R. Treleven	Paul H. Rabinowitz	Brandon T. Von Feldt
Helen L. Braun and Daniel D. Maki	Lavon R. and Bruce E. Frazier	Mark L. Lewis	James T. and Judith A. Remington	Michael L. Wage and Kathy A. Vogel
Dennis W. and Lorraine C. Brewer	James W. and Pamela J. Freeman	Zonghao Li	Federico Rey	Mona C. Wasow and Richard A. Brualdi
Curt A. and Susan K. Bronkhorst	Robert A. Fruit	Hao Lin	David A. Roe	Joyce D. and David W. Webb
Fay A. and James S. Burmeister	Ann E. Frye	Robert B. and Barbara J. Lind	Cris T. and Susan Roosenraad	Linda C. Weinberger
Benjamin M. Cain	William F. and Pamela L. Gee	Alan J. Link	Kathryn R. Rudolph	Kelly L. Wieand
David A. Cancell	George I. and Roza Glauberman	James K. and Linda R. Low	John K. Rush	David C. Wilson
Patricia M. and Richard Cantwell	Richard W. Glove	Jo Ann Lutz	Serkan Sakar	Steven Wong
Alfred S. Carasso	Michael S. Goldman	Joseph Malkevitch	Charles S. and Christine L. Salisbury	Bokai Yan
Carl B. Carlson	Judith A. Goldsmith	Kay K. McAllister	Bruce D. Salzman	Charles T. and Lois S. Young
Ralph W. Carr	Donald R. Goral	Patricia A. McAuley	Brandon J. Santos	Paul M. Yu
Chia-Chin Chang and Ying-TE Liu	Andrew J. Gould	Peter A. McCoy	Richard A. Schrott	David F. Zavadsky
Cynthia E. Chin	Samuel R. Govier	Richard P. and Tamara S. McGehee	Peter D. and Julia E. Schult	Zhennan Zhou
Michael S. Christopherson and Shahrzad Bakhhtian	Marie K. and Jason Griffin	Nancy E. McKinley	Susan J. Schultheiss	Yufei Zhu
Lawrence E. and Tammy M. Colassacco	Mark E. and Suwimon Hall	Rand Methfessel	Michael J. Schwietzer	Christina D. Zwarych
Kevin J. and Judith Compton	Sarabeth A. Hall	Rochelle W. and Walter J. Meyer	Erik M. Scott	
	Kirk D. Haller	Charles J. and Kaitlyn E. Meyers	Richard B. Seguin	
	Brent E. Halsey	John R. Michel	Mark C. and Penny Sell	
	Sally M. Handy-Zarnstorff and Michael C. Zarnstorff	Carol S. and Kenton D. Miller	Timo N. Seppalainen	
	Carol J. and John Harkness			
	Matthew J. Harrington			



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Jean-Luc's taffy demonstration during the Science Day at WID

Professor Jean-Luc Thiffeault presented on the stirring and pulling of taffy as a mathematical problem, and taffy-pulling devices, during the "Mathy Taffy" demonstration at the Wisconsin Science Festival at Wisconsin Institutes of Discovery on November 5, 2017. Chef Keith Green (of Steenbock's on Orchard) made taffy for the assembled audience of all ages.