



College of Letters & Science
UNIVERSITY OF WISCONSIN-MADISON

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

2025



CONTENTS

- | | | | | | |
|---|--|---|-----------------------------|----|------------------------|
| 2 | WORD FROM THE CHAIR | 6 | JULIE MITCHELL IS EMERITA | 10 | GRADUATE AWARDS & NEWS |
| 3 | STEFFEN LEMPP RETIRES | 6 | GOLDWATER AWARD WINNERS | 12 | FACULTY AND STAFF NEWS |
| 4 | GEOMETRIC LANGLANDS
CONJECTURE SOLVED | 7 | ALUMNI NEWS | 14 | ALUMNI NEWS |
| 5 | NEW HONORS, NEW PEOPLE | 8 | UNDERGRADUATE AWARDS & NEWS | 15 | IN MEMORIAM |
| | | 8 | LAB CORNER | | |



Cover photo by Sara Nagreen

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A Word from the Chair

It is an understatement to say that higher education is facing some major headwinds in the United States today. By May 21 of this year, the NSF had only awarded \$32 million dollars to research in mathematics, representing a 72% drop in the 10-year average. This is the second-largest drop in funding, after physics. In the media there is a lot of noise (though perhaps not enough) about cuts to the NIH, but the most basic fundamental sciences are being affected. This comes at a time when AI is a growing share of our lives and the economy, and a tremendous amount of research is needed to ensure that these

exciting new technologies are deployed safely and equitably. Other nations are paving the way in quantum computing; we are dramatically shrinking our efforts. Cryptography requires the most sophisticated mathematical tools to guard against these future quantum computers. We are walking away.

How does this affect our department? We have been lucky to suffer few outright grant cancellations, though there have been delays and a scaling back of scope. We do not yet know what the success rate of future grant applications will be, but it is bound to be much lower. In math we are also fortunate that we can depend on teaching positions for our PhD students to support them, but fellowships and grant support allow our students a much needed opportunity to focus on their research. The whole atmosphere has had a chilling effect on any young person who dreams to study mathematics. In addition, there have been visa issues for some of our international graduate students, whose teaching and research skills are essential to the life of our department. Many will decide not to come at all.

I apologize for the unrelenting grimness of this Chair's letter, which is usually a cheerful celebration of our past year's accomplishments, but this large-scale transformation of American higher education is unprecedented. For us, it means right now a 7% budget cut, which we will satisfy through various efficiencies. In addition to affecting our core mission of education and research, the cuts will make it harder for us to invite top speakers to our seminars, or to send our graduate students to conferences to gain valuable experience and connections. Should you feel generously inclined towards your former department, we invite you to make a contribution to our Math Annual Fund, or to one of our other funds. Our current aim is to enhance our Annual Fund into an endowed fund, which requires a minimum balance. We greatly appreciate your support in that effort.

There is still much to celebrate about the past year. In the newsletter you will find a story on Prof. Dima Arinkin, who was part of a group that solved the famous Geometric Langlands conjecture.

Our Madison Experimental Math Lab(MXM) is all about small groups exploring mathematical questions. Undergraduate students take exploratory perspectives on mathematical problems, spend a semester learning from a mentor, and present their new knowledge to the department, all in the course of a single semester. This process is all about collaboration to achieve a singular goal.

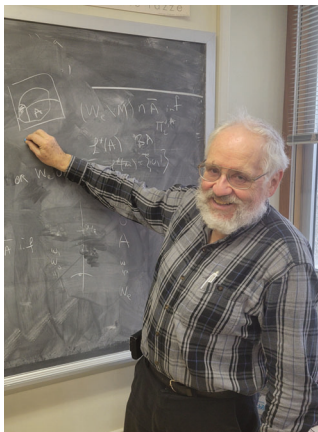
Two of our emeriti greats, Thomas Kurtz and Marty Isaacs, left us this year. Marty and Tom really knew the meaning of working to create community. Marty even has an AMS award in mathematical writing, first awarded this year, named after him. Tom continued to participate in our probability seminars well after his retirement. They will be missed greatly.

Within the pages of this newsletter, I invite you to join us in remembering your time with the Math Department, and to support us as we continue to allow students the chance to emerge as better thinkers and better mathematicians. We depend on your generosity in supporting our efforts in working with students and we depend on your support in promoting the UW's contribution to local Wisconsin communities. Together, we can achieve great things.

Yours,

Jean-Luc Thiffeault
Department Chair

Steffen Lempp Retires



Professor Steffen Lempp retired at the end of the fall semester of 2024. He had been a faculty member in the math department since 1988, totalling 36 years. He had mentored 18 graduate students, including one in Kazakhstan and one at Indiana University.

Steffen became interested in logic and found it to be one of the more accessible specializations due to it being a young field of study. Logic itself only became formally organized in the 1920s. Steffen's subspecialty was in computability theory, which examines the proofs as objects in determining if a problem can in fact be solved effectively. Kleene was one of the

first to really study computability in the 1950s.

Throughout his career, his work has brought him to many different locales, including Russia, Kazakhstan, Singapore, Heidelberg, Wellington, Vienna, Siena (Italy) and Leeds. His family often joined him in his travels.

Madison was always home though, and will continue to be so. During his retirement, Steffen is looking forward to traveling with his wife. On the plan are trips to the Galapagos Islands, Hudson Bay and Route 66. He has two of his three children nearby, and is looking forward to seeing his grandchildren more often as well, two of whom live in Oakland, CA.

When not traveling, he's also interested in translating old logic papers, which were often written in French. He recently translated a 1912 paper by Hausdorff. Of course, this will supplement regular visits to the math department, where we look forward to seeing him at our logic seminars.



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Help us build our Math Alumni Site!

When you come to Wisconsin to study math, you become part of the Wisconsin family. We'd love to hear back from you how your life is going, and what exciting things are happening!

We've built a brand new Math Alumni page to better sort and display the updates that our alumni provide, and we'd love to have your help in building it.

Your information is the most valuable part of this site. There's no account to create, just a form to tell us about your accomplishments. And then we'll take your post and make sure it is put on display to share with your fellow alumni.

Check it out: <https://mathalumni.math.wisc.edu>



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Dima Arinkin's work helps to advance what some have called the Grand Unified Theory of Mathematics

BY AARON R. CONKLIN

Dima Arinkin didn't fully realize it at the time, but even as an undergraduate student, the work he was doing was part of something much, much bigger.

Arinkin, a professor in the Department of Mathematics, has spent his career studying algebraic geometry, a discipline that uses algebraic equations to describe and reveal truths about geometric shapes. Put another way, Arinkin uses one branch of mathematics to shed light on another, creating a bridge between the two.

That approach is also the essence of something called the Langlands Program, a multi-pronged conjecture first proposed by the Canadian mathematician Robert J. Langlands in the 1960s that relates to the mathematical description of complex waves and frequencies. Exploring its impact has been the work of multiple decades for armies of modern mathematicians, united in their pursuit of what Edward Frenkel, a mathematician known for his efforts to popularize difficult concepts, called "the grand unified theory of mathematics."

"Some of the first things that I worked on were already motivated by the Langlands conjecture," says Arinkin, who came to UW-Madison 11 years ago following stints at the University of North Carolina and the California Institute of Technology. "I didn't understand the topic or the big picture then, but now I do."

A paper Arinkin co-authored in 2012 on ind-coherent sheaves — an algebraic tool for studying geometric spaces — became one of the main building blocks that allowed a different group of nine mathematicians to prove one of the trickiest parts of the Langlands Program, the Geometric Langlands Conjecture, earlier this year. Creating connections between multiple fields of mathematics was central to the proof.

"That's what makes this area so exciting for me, because it's like you start speaking one language, and then you realize what you are saying actually makes sense in a different language," Arinkin explains. "You can say something algebraic and then jump into a geometric explanation or geometric argument. That's one of the big reasons why it's so hard to talk about, because if we're going to use several languages, we need to understand them all."

He's not wrong about the Geometric Langlands Conjecture (and its significance to the field of mathematics) being difficult to describe — especially to a non-mathematician audience. Its particulars involve complex terminology like automorphic functions and eigen-sheaves.

"What made people excited about this conjecture is that it said that something

you can compute through manipulating with numbers, should match some other computation that you can do by studying symmetries of different kinds of objects," says Arinkin.

The Geometric Langlands Conjecture may have been proven, but the research surrounding the other branches of the Langlands Program is far from complete. Arinkin believes there's now work to be done looping geometric methods back to their origins in number theory, leveraging connections to different areas of mathematics and beyond, including fields such as quantum physics. The Geometric Langlands Program represents just one of the ways in which mathematicians are collaborating across disciplines.

"Now that there is all this development, now that there are all these exciting things we can prove in the geometric field, we can ask whether we can bring all this understanding back," Arinkin says. "We are trying to understand how to use something developed in one area in another area of mathematics. But as we try to answer it, we have to develop new tools."

In doing so, there's the possibility of creating even more bridges, this time between fundamental and applied mathematics. Arinkin points to number theory, a discipline that was developed multiple centuries ago with no practical application in mind. Today, the principles of number theory have become the central basis for internet encryption, an essential piece of the modern technological landscape. Arinkin's own research is often more fundamental than applied, but the tools he ends up creating through that research could have critical practical applications in the future.

"Mathematics is so abstract, it also means that it's universal," says Arinkin, pointing out that something as straightforward as practically solving equations can become useful to something like predicting epidemic distributions during an outbreak. "It's like you invent a tool that can magically drill through a thick wall of rock. I might not immediately know how to use it, but it's amazing that we have figured out how to do it."

Arinkin makes a point of coaching the PhD students he teaches to take an approach that ignores boundaries and incorporates perspectives from multiple areas of mathematics, just as he has done with his own research.

"Sometimes it's very easy to get overly focused on your own area. As students, it's the best time to expand your horizon a little bit so that you at least know what's happening with the big picture of mathematics," he says. "The boundaries between different areas of mathematics are not rigid in the abstract world, and they are not rigid in our department."

DIMA ARINKIN
PHOTO COURTESY QUANTA MAGAZINE



Brilliant new arrivals are bringing honors with them.

Our new colleague **Rajula Srivastava** (coming this Fall) has won one of the 2025 Maryam Mirzakhani New Frontiers Prizes! Rajula is also a graduate of our department, having received her PhD in 2022 with Andreas Seeger. She was awarded "For her making a progress in a challenging area at the intersection of harmonic analysis and number theory by focusing on bounding the number of lattice points one can find near a given smooth surface, with important applications to Diophantine approximation in higher dimensions."



<https://breakthroughprize.org/Laureates/3/L3981>

Timothy Cheek, who is currently studying at the University of Michigan receiving his Bachelor's and Master's concurrently, has been awarded a prestigious NSF graduate fellowship. Timothy is broadly interested in number theory and algebraic geometry, with his previous research focusing on automorphic forms and point counting on elliptic surfaces. At the University of Wisconsin, Timothy envisions focusing on arithmetic statistics, although he still wishes to further explore arithmetic geometry more generally. The NSF GRFP, awarded to those demonstrating high potential for significant research achievement, will provide him with three years of funding to dedicate significantly to his research. Congratulations, Timothy, and we look forward to seeing you in Madison in the Fall!

Geometric Langlands Conjecture Proof wins the "the Oscars of Science"

Dennis Gaitsgory of the Max Planck Institute for Mathematics (MPIM) at Bonn won what is considered "the Oscars of Science" at a recent awards ceremony held on April 7, 2025. Gaitsgory was honored "for his central role in the proof of the geometric Langlands conjecture."

Christina Aguilera and OpenAI co-founder Greg Brockman presented Dennis Gaitsgory with the Breakthrough Prize in Mathematics. Brockman lauded the mathematician who had "devoted three decades to building an extraordinary bridge between ideas." Gaitsgory stressed the social side of science, telling young people starting down the road of math, "You don't have to walk this path alone."

While Gaitsgory was honored, his work was the result of the collaborations with 10 other mathematicians, including our own **Dima Arinkin**. Read more about Dima's research and how it was used collaboratively to make this discovery on page 4.

Cecily Bartsch, currently a master's student at Loyola University Chicago, has been awarded a prestigious DoD NDSEG Fellowship supported by the Army Research Office. The DoD NDSEG Fellowship is a merit-based award that supports graduate study in STEM fields relevant to national defense. In mathematics, there are typically around six awards granted nationwide each year, and they provide full tuition and a stipend for up to three years. Cecily has focused her research and coursework on analysis, and intends to continue working in this area at UW-Madison. Congratulations, Cecily, and we look forward to seeing you in Madison in the Fall!

TARO NAKAMURA AND SETH DONOUGHE

Jenni Hart will soon start work at the Department Administrator, taking over for Heidi Udelhoven, who has moved to a new position at L&S Administration. Jenni



has won one of this year's Martha Casey Award for Dedication to Excellence. This award recognizes staff who perform their assigned jobs outstandingly and thereby make things work. They are typically not managers who supervise others; rather they are on the front lines of day-to-day work and lead from within the organization. Their dedication to the university and its mission are obvious. The term "unsung hero" is often applied to them. We are

pleased to have Jenni joining us and look forward to continued outstanding service.



PHOTO BY MARK CASTILLO

Two math majors among 2025 Goldwater Scholarship awardees

Three University of Wisconsin–Madison students have received 2025 Goldwater Scholarships, considered the country’s preeminent undergraduate scholarship in mathematics, the natural sciences and engineering.

UW–Madison’s winners are juniors Alyssa Choi and Pramana Saldin and sophomore Elliott Weix. Saldin is a math major with a certificate in computer science and Weix is double majoring in Biochemistry and Mathematics.

Pramana Saldin is a junior majoring in mathematics with a certificate in computer sciences. His current research interests are in algebra and geometry. Since freshman year, Saldin has been involved in the Madison Experimental Math Lab (MXM), where faculty, graduate students and undergraduates work together to research mathematics and develop exploratory software. He has worked on MXM projects

with Tullia Dymarz and Jordan Ellenberg on geometric group theory and machine learning for mathematics. He has also contributed to a summer research project on Teichmüller dynamics with Paul Apisa. Saldin has presented his work at the 2024 Joint Mathematics Meeting and is a co-author of a recently published paper in *Geometriae Dedicata*. Saldin plans to pursue a doctorate in mathematics. He also works at the Math Learning Center as a tutor.

Elliott Weix of Madison, Wisconsin is a sophomore majoring in biochemistry and mathematics. As a high school junior, he joined Scott Coyle’s biochemistry lab through the High School Research Internship program. Weix has continued at the lab as an undergraduate, earning co-authorship on a high-profile paper published in the journal *Cell* in 2024 as well as on two pre-printed manuscripts. Recently,

Weix’s research led to an original discovery, which he is developing into a model for studying the development of multicellular structures from a single-cell perspective. He plans to pursue a doctorate in computational biology or biochemistry and a career researching epigenetic inheritance mechanisms using mathematical tools and synthetic biology methods.



Alyssa Choi, Elliott Weix and Pramana Saldin.
Photo by Bryce Richter



Julie Mitchell has become an Emerita Professor this fall, after seven years at Oak Ridge Labs in Tennessee. She was a faculty member in our department from 2003–2019.

Julie Mitchell has become an emerita professor

While at the UW, vector calculus was her favorite service course, which covers 3D shapes, vector fields, level sets, flows and fluxes. She also enjoyed teaching Math 606, which was a specialty course specifically developed to be half an applied math course and half a molecular modeling course.

Her specialty was the use of artificial intelligence and high performance computing in modeling protein structures and their interactions. Last year’s Nobel Prize in Chemistry honored a Google researcher who used large-scale machine learning to solve a piece of the protein folding problem. Google announced its breakthrough in 2018. She worked on these types of problems as early

as 2005, yet she found it challenging to convince people of their value. According to Julie, there was a great deal of resistance to the use of AI because people felt it did not offer a mechanistic answer to their problems.

During her retirement, Julie will be doing some creative writing. She also learned how to do stained glass a couple of years back and will pursue that as another artistic hobby. She is making glass boxes, kaleidoscopes, and perhaps some Escher tilings (<https://shapelyglass.wordpress.com>).

She enjoys motorsports, as she has a fast car and drives accordingly.

Alumni News

Nicos Georgiou (PhD 2011, advisor Seppäläinen) has been appointed Professor of Probability Theory and Applications, University of Sussex, UK.

Christian Noack (PhD 2018, advisor Seppäläinen) has been appointed Lecturer of Actuarial Science at Purdue University.

Xiao Shen (PhD 2021, advisor Seppäläinen) has finished his postdoc at University of Utah and will shortly begin a tenure-track assistant professorship at North Carolina State University in Fall 2025.

Louis Fan (Van Vleck 2015–2018, mentors Roch and Seppäläinen) has moved from Indiana University, Bloomington, to an associate professorship in the School of Data Science and Society at University of North Carolina, Chapel Hill.

Catherine McSorley (B.S., 2019) started an additional role as Adjunct Faculty teaching Data Science Foundations to the M.S. Business Analytics students at the University of Redlands. She also works as a Senior Product Engineer on the Spatial Statistics team at Esri.

Chung-Han Hsieh (M.S., 2018) is currently an Associate Professor of Quantitative Finance at National Tsing Hua University, Taiwan.

Matthew Dwyer (B.S., 2023) works as an estimator for the Aerospace & Defense Industry.

John Servais (B.S., 1972) has retired after 33 years as a high school math teacher. He was his high school math

department's chairperson for several years and received the Teacher of the Year award in 2003. He and his wife married in Madison in 1972 upon their graduation and recently celebrated their 52nd year wedding anniversary. They are especially proud that our granddaughter who grew up in Minnesota was a junior at UW- Madison this school year. She is doing very well and is really enjoying her experience.

Bill Heyman (B.S., 1989) is a principal at CodeMorphic, a company that applies machine learning to software engineering.

Semra Öztürk (Ph.D., 1995, advisor Assadi) is currently an Associate Professor at Middle East Technical University, Ankara, Türkiye.

Paul Schuette (Ph.D., 1991, advisor Ney) works as the Deputy Division Director, Division of Analytics and Informatics in the Office of Biostatistics in the FDA. He also has received the FDA Commissioner's Special Citation "for outstanding performance in conducting the review of nirmatrelvir/ritonavir (Paxlovid) for treatment of mild to moderate COVID-19 in certain high risk patients." He was recently on a podcast (with Tina Wang) about "Improving Data Quality with Centralized Statistical Monitoring".

Bob Jette (B.S., 1991) is a partner at J&H Fulfillment. J&H Fulfillment recently was awarded "Fulfillment and Inventory Management Service Company of the Year" for 2024.

David LeRoy Buechler (M.S., 1968) has retired from Northrup Grumman. He has self-published a book updated on his website (<https://www.heavenlights.com>). He was principle-engineer on the GATS/GAM program to deliver tactical bombs from the B2 flying wing to navigator-defined targets, as used during the shock and awe war in Iraq. He also technically managed the Titan II missile guidance system replacement program, and MIT on Apollo.

Jordan Francis (B.S., 2019) has been appointed Policy Counsel for the Future of Privacy Forum, a nonprofit, nonpartisan think tank in Washington, D.C. This organization advances policy research on privacy

and data protection. As a member of the U.S. Legislation team, he supports research and independent analysis concerning federal, state, and local consumer privacy laws and regulations. His math background helps him understand data processing activities and advances in emerging technologies, such as artificial intelligence. He continues to publish independent research and scholarship in law reviews.

Riley Cashin (B.S., 2015) is a Customer Analytics Architect at Reveal Data. Riley works on the customer team for an AI-focused software company in the legal industry. They use various aspects of supervised and unsupervised learning to narrow down text-based analysis.

Bryce Schultz (B.S., 2020) is a Data Analyst at American Tack & Hardware. He works as a cross-functional analyst between the Sales and Supply Chain teams at his company and uses POS data to forecast future sales and manage inventory utilization. Using a self-built modeling program, his company now has a 98% forecast accuracy and a MAPE below 4%. Along with forecasting, he works closely with the management team to ensure data integrity throughout the company.



Mathematics faculty members at the University of Louisiana at Lafayette who have UW Mathematics degrees. L-R: Katie (Lokken) Boddie, BS 2009, Bruce Wade, BS 1982, MS 1984, PhD 1987 (Adviser: John Strikwerda), Jiaxin Jin, MS 2015, PhD 2021 (Advisers: Craciun & C. Kim) Photo by Dr. Mo Li, Dept of Math, University of Louisiana at Lafayette

**We'd love to
hear from you!**

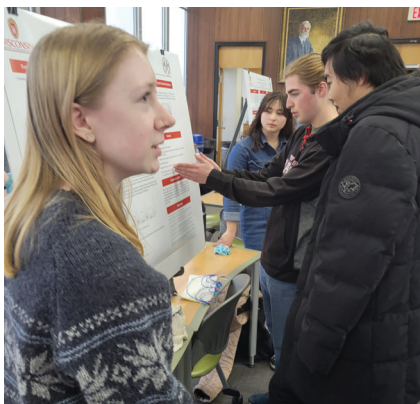
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UNDERGRADUATE AWARDS &



Studying hyperbolic geometry with a crochet hook

Hyperbolic geometry is a type of geometry in which the surface has constant negative curvature. It is occasionally seen in nature, such as in kale leaves, and is an example of when the rules made for Euclidean geometry are not followed. The MXM project was to investigate hyperbolic geometry using crochet. The team was composed of four undergraduate students (Emi Bell, Tyson Franke, Alyson Geisler, Jackson Grabowski), a graduate student mentor, Alison Byars, and a faculty mentor, Grace Work.

Not everyone was necessarily an expert in topology or crochet starting out, but the group eventually settled on roles for those not as comfortable, such as figuring out the math to crochet process, aided by textbooks. Alison Byars transferred her skills in knitting to crochet for the project. After a brief period of training, they set off to see what they could create.

Translating geometry to a physical shape using crochet involved adding extra stitches in a consistent manner to each project. Each team member took the time to create their own hyperbolic crochet, at first trying to add a stitch to every other stitch, but that resulted in an extra curly shape. In order to model rules such as the parallel postulate, angle sums and circles, the team decided to collaborate on a larger and flatter shape, which involved adding an extra stitch every 10 stitches. This created a more malleable and flatter surface that offered the ideal space to create defined hyperbolic example shapes.

Each member of the team created a small part of a circle which was then stitched together by Alyson Geisler. Once that was created, it was easy to start the process of adding the various axioms, such as lines, circles or triangles. These were simply stitched into place, but then examined from a flat perspective on the circular piece. Triangles elongated and stretched. Lines looped and turned. Circles became ovals.

There is a way to demonstrate these weird shapes in the Poincare disk model or the upper half-plane model, but there's something to demonstrating on and manipulating the actual surfaces with your hands as opposed to just visualizing it.

"The Poincare disc model in which the entire space is modeled in a disc and the upper half plane, lines look so weird in it, because they are half circles. It looks like you are making things up because things look so weird. But in a physical space, you can see why the lines are supposed to curve, which gives a reason why we came up with those models. We made it straight by folding it in half and then stitching across the half, and when we do that, it does look somewhat curved. It has been transformed into what you would see in the theoretical model," said Emi Bell, a junior majoring in Math.

The result of all of this is not only some really interesting crochet projects, but a poster session so their work



Undergraduate Awards

Augusta Schurrer Undergraduate Student Support Fund:

Annelise Alvin

Linnaeus Wayland Dowling Scholarship:

Ethan Hanold

Felice Michaels Levin

Scholarship Fund for Mathematics:

John Campell

Frank D. Cady Scholarship:

Maya Williams & Matthew Norton

R. Creighton Buck Prize Fund:

Chentian Wu

Mark H. Ingraham

Math Scholarship Fund:

Yilin Shi

Mary Ellen Rudin

Mathematics Fund:

Haotian Zou

Terry Millar Memorial Fund: -

Haran Mouli

Violet Higgitt Frank Scholarship:

Pramana Saldin

could be viewed by the entire department, and indeed, even visiting high school math students!

Emi even went on to do a Directed Reading Project (DRP) in Spring 2025 on the same topic. The DRP is a way that an undergraduate student can go deeper into a specific topic with the help of a graduate student mentor. After that (and a course in Modern Algebra), Emi admitted even greater understanding from that additional work.

NEWS

Michael Zhao wins Hilldale Scholarship



When Michael Zhao started at the UW, he knew he wanted to pursue a Ph.D. someday and recognized the value of hands-on experience. The AMEP Lab, one of only a handful of physical labs housed in math departments in the US, immediately caught his attention. (AMEP - Applied Math, Engineering, and Physics - is a degree program which is guided by numerous faculty

members in the mathematics department). Michael was particularly drawn to recent work in the lab on the behavior of bodies in supersaturated fluids like carbonated water, which was detailed in last year's article on Saverio Spagnolie's research with 'dancing raisins'. (<https://go.wisc.edu/2024vvv>)

Michael recently won a Hilldale scholarship to advance this research, by focusing on a critically important aspect of these motions: body rotation at the fluid-air interface. In the original 'dancing raisins' experiment, bodies were found to settle to the container bottom, whereupon bubbles forming upon their surfaces would lift them back upward. Body rotations at the free surface were critical to then rid them of these surface bubbles, sending them plummeting downward to begin their cycle again.

In Michael's research, he is focusing on how and why such rotations occur using tabletop experiments, numerical simulations, and reduced-order model dynamical systems. And he's exploring the role of body geometry in a more controlled setting using 3D printed spheres and cylinders with different weight distributions, which are filmed and tracked as they rotate in carbonated fluid like in the earlier experiment. The dynamics have revealed intriguing back-and-forth wobbling, and aperiodic rolling states.

Although the day to day work is to carefully explore fundamental features of a simple tabletop system, the research may eventually speak to important geophysical questions like the role of particulates in the degassing of magma, or the relevance of melting on the overturning of icebergs.

Michael is a senior now, and will graduate next year. He will present his work at this year's annual Division of Fluid Dynamics meeting of the American Physical Society (APS) in Houston this November. He plans on applying to Ph.D. programs that would allow him to continue his training in applied mathematics. He is also participating in another research program in China involving a rather different type of fluid-structure interaction: robotic fishes.

The Problem Potluck

Each year, students interested in taking the MAA Putnam Exam gather to review and prep for any problems that they might encounter during this challenge.

The first week that the Putnam Club met, they collected a set of student submitted problems and called it the Problem Potluck. As the semester progressed, the students used that as a way to structure their weekly meetings together, especially if the faculty mentors couldn't join them.

Come December, the students had a good basis in a wide variety of problems and had established a community of sharing interesting problems to work out together. Their weekly meetings continued after the December Putnam Exam and come April, they were ready to take the Undergraduate Math Exam as well. The results show for themselves.

In Putnam, our team (Haran Mouli, Jonah Guse, Lucas Allen) placed 21st nation-wide (out of 477 participating institutions) - above historical average for us, definitely better than last year.

Haran Mouli also got an individual Honorable Mention by placing in the top 100 (out of 3,988 students), while Jonah Guse and Lucas Allen got in the top 200 and top 500 respectively.

In our own UW competition, these three got the top three places as well. Two more students: Pramana Saldin and Daniel Zikel got Honorable Mention in the UW Math competition.

Congratulations all!



UW Photo Library

GRADUATE STUDENT AWARDS &



Tejasi Bhatnagar and her family during the Math Department Graduation Ceremony, May 9, 2025.
Photo by Sydney Gums

2024-2025 PhD Graduates

Jeremy Johnson (Pimentel-Alarcon)
Nathan Nicholson (Terwilliger)
Junyi Wei (Q. Li)
Tejasi Bhatnagar (Shankar)
Owen Goff (Terwilliger)
Phillip Harris (Marshall)
Jiaqi Hou (Marshall)
Andrew Krenz (Dymarz)
Daniel Levitin (Dymarz)
Ang Li (Miller)
Yuchen Li (H. Lyu)
Sean Nemetz (Poltoratski)
Ian Seong (Terwilliger)
James Tautges (Stovall)
Lizhe Wan (Ifrim)
Jacob Denson (Seeger)
Woojin Kim (H. Lyu)
Yi "Peter" Wei (Kemeny)
Yiyu Wang (B. Wang)
Shi Chen (Q. Li)
Yuxi Han (Tran)
Josiah Jacobsen-Grocott (Soskova)
John Cobb (Erman/Kemeny)
Jiwoong Jang (Tran)
Alex Mine (Arinkin)

Campus Wide Graduate Student Awards

Two of our TAs have won Campus TA awards. Both were recognized at an awards ceremony on March 11, 2025.

Rachel Hanger was chosen for the Early Excellence Award which recognizes outstanding performance by TAs with fewer than four semesters of teaching experience.

Peiyi "Penny" Chen was chosen as one of the three recipients for the Chinese Graduate Student Support Award, which is granted in recognition of PhD students making progress toward their degrees while at the same time working on campus as an accomplished Teaching Assistant.

Math Department Graduate Teaching Awards

Early Career Awards (for TA's who have shown exceptional teaching during their first 1-2 years)

Kendra Ebke, Rachel Hanger, Elizabeth "Liz" Hankins, Rachel Heikkinen

Exceptional Teaching Award (all TA's are eligible for this award)

Jacob Fiedler, Owen Goff, Alex Menzia, Jack Messina, Eiki Norizuki

Exceptional Service Award (for PhD students who have performed exceptional service related to the mission of their department and university)

Karthik Ravishankar

Capstone Award (for a graduating PhD student with an extraordinary teaching record during their time)

Ian Seong, Amelia Stokolosa

2024-2025 MA GRADUATES

Haojun Chang	Yining Yang	Zhang Jiang	Ruihua Wang
Yanbo Cheng	Shuguang Yao	Zimeng Li	Wenye Xue
Shuting Han	Zihan Zhang	Xiao Li	Ning Yi
Dylan Jamner	Yu Zhou	Zhenliang Liu	Shaoyi Zhang
Zuozheng Lyu	Yibei Gao	Zhaolun Luo	Xiyu Zhang
Tiffany Mankowski	Yaoxing Yang	Xiang Meng	Yuanji Zhong
Lei Nikou	Changzhou Chen	Jiahao Ming	Mengchuheng
Ankit Raheja	Boren Guan	Siyu Niu	Feng
Rajkamal Vasu	Wenxin Hou	Tianyu Wang	

NEWS

Where are our graduates going?

Nathan Nicholson - Quantitative Trader/Developer, Tibra Capital

Junyi Wei - Research Scientist/ Research engineer, Huawei

Andrew Krenz - Postdoctoral Fellow, Brandon University

Phillip Harris - Postdoctoral Fellow, Universität Bonn

Jiaqi Hou - Postdoctoral Fellow, Louisiana State University

Ian Seong - Visiting Assistant Professor of Mathematics, Williams College

Yiyu Wang - Postdoctoral Fellow, The Ohio State University

Yi Wei - Visiting Assistant Professorship, University of Arkansas

Tejasi Bhatnagar - NSF Postdoctoral Fellow, The Ohio State University

Ang Li - Network Protocol Researcher, Huawei

Zuozheng Lyu - University of Waterloo Ph.D. program

Tiffany Mankowski - Data Analyst

Lei Nikou - University of British Columbia - Math Ph.D.

Ankit Rahela - University of Pittsburgh Medical School

Rajkamal Vasu - Temple University Ph.D. program in Mathematics

Changzhou Chen - 37 games in Guangzhou; game designer specialized in numerical values

Boren Guan - UW-Madison Math Ph.D. program

Zhang Jiang - UW-Madison Math Ph.D. program

Ziming Li - Purdue University Industrial Engineering Ph.D. program

Zhenliang Liu - Georgia Tech Math Ph.D. program

Jiahao Ming - University of Waterloo, Actuarial Science Program

Siyu Niu - University of Iowa, Business Analytics Ph.D.

Ning Yi - University of Utah, Math Ph.D. program

Shaoyi Zhang - University of Virginia, Math Ph.D. program

Yanbo Cheng - University of Missouri, Mathematics, PhD

Dylan Jamner - UW-Madison, Math, PhD

Shuguang Yao - Texas A&M University, mathematics, PhD

Wenxin Hou - University of South Carolina, Math PhD

Jiang Zhang - UW-Madison, Math, PhD

Xiao Li - Purdue University Industrial Engineering PhD program

Meng Xiang - Shokz

Mengchuheng Feng - Tencent

Math Department Graduate Research Awards

Excellence in Mathematical Research Award: Tejasi Bhatnagar, Jacob Denson, Jiaqi Hou, Yiyu Wang

John A Nohel Prize in Mathematics Scholarship: Marios Andreou

Elizabeth Hirschfelder Fellowship: Peiyi Chen, Kaiyi Huang

Henry Schaerf Mathematics Graduate Award: Sam Craig, Martin Guerra, Gautam Neelakantan Memana

Bung-Fung Lee Torng Award (for Ph.D. students for funded support for research during the summer): Yahui Qu, Jingyi Li



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FACULTY/STAFF News & Awards

PHOTO LIBRARY

Faculty News

Joshua Mundinger, one of our Van Vleck postdocs, was awarded a National Science Foundation postdoctoral fellowship.

Mihaela Ifrim and **Hao Shen** received the prestigious Vilas Associates award. The Vilas Associates Competition recognizes new and ongoing research of the highest quality and significance.

Mikhail Feldman named Steenbock Professor of Mathematics, taking over for Jin-Yi Cai. This is a 10 year professorship.

Caglar Uyanik is the recipient of a NSF CAREER award. This money will support Caglar's research into group actions, rigidity, and dynamics in low dimensions and also provide ongoing support for the Madison Experimental Math Lab.

CAREER: The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of early-career faculty who have the potential to serve as academic role models in research and education and to lead advances in the mission of their department or organization.

Caglar also co-organized the Midwest Summer School in Geometry, Topology and Dynamics, which occurred June 2-6, 2025. A third conference, Geometry Labs United, will be held in 2026.

Betsy Stovall, **Sergey Denisov**, and **Jordan Ellenberg** were all honored by being selected as 2025 Simons Fellows.

Maurice Fabien was awarded the MGB-SIAM Early Career Fellowship. These awards are given to accomplished early career professionals who were chosen based on their achievements; active support of diversity, equity, and inclusion in their communities; and dedication to industrial and applied mathematics, computational science, and data science.

Associate Professor **Botong Wang** was awarded a fellowship at the Institute for Advanced Study (IAS) for the 2024-2025 academic year. This prestigious membership allows for focused research and the free and open exchange of ideas among an international community of scholars at one of the foremost centers for intellectual inquiry.

Through her work with the NSF, **Mihaela Ifrim** has been awarded a prestigious Presidential Early Career Award for Scientists and Engineers (PECASE).

Established by President Clinton in 1996, PECASE recognizes scientists and engineers who show exceptional potential for leadership early in their research careers. The award recognizes innovative and far-reaching developments in science and technology, expands awareness of careers in science and engineering, recognizes the scientific missions of participating agencies, enhances connections between research and impacts on society, and highlights the importance of science and technology for our nation's future.

Andreas Seeger has been named as a section lecturer in analysis during the International Congress of Mathematicians in July 2026 in Philadelphia, PA.

On July 18, 2024 at the Program in Mathematics for Young Scientists (PROMYS) math camp, **Jordan Ellenberg** gave the 2024 Arnold Ross lecture. The audience was talented teens and their undergraduate counselors. The Arnold Ross lecture was named after Arnold Ross for his many contributions to the development of mathematical talent, including outreach programs at Ohio State that survive to this day

In a vigorous hour, Ellenberg introduced the "cap set problem," a popular question in combinatorics which is related to large subsets of



integers containing no three terms in arithmetic progression, and to the card game Set.

He engaged the audience, asking

them to work together on a simpler example so they could get a feel for the problem. Most everyone called out the same answer – "4!" – to Ellenberg's delight.

Sixteen-year-old Lisa from California summed it up. "I thought the way Jordan related a simple yet well-known game of Set to a fundamental problem in number theory reflected a core value of PROMYS: Think deeply about simple things."

Not coincidentally, "To think deeply about simple things" was a motto of Arnold Ross.

Link: https://www.ams.org/news?news_id=7347

TerwilligerFest occurred in June 2025 in Slovenia

The conference will be celebrating the 70th birthday of **Paul Terwilliger**. As such, the general theme of this conference will be the mathematical topics that Paul has worked on over the years (which all have relationships to the q -Onsager algebra).

These topics include the following:

Topics in algebraic graph theory, such as distance-regular graphs, association schemes, the subconstituent algebra, and the Q -polynomial property;

Topics in linear algebra, such as Leonard pairs, tridiagonal pairs, billiard arrays, lowering-raising

triples, and a linear algebraic approach to the orthogonal polynomials of the Askey scheme.

Topics in Lie theory, such as the tetrahedron algebra and the Onsager algebra;

Topics in algebras and their representations, such as the equitable presentation of $Uq(\mathfrak{sl}_2)$, the q -tetrahedron algebra, the q -Onsager algebra in mathematical physics, and the universal Askey-Wilson algebra.

Link: <https://conferences.famnit.upr.si/event/32/>



Photo by Jiaxin Lu

Marissa Loving's Favorite Shape

Scientific American asked mathematicians to choose their favorite shapes and surfaces and tell us why they find them so exciting and intriguing.

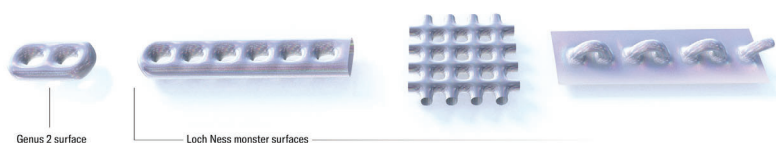
Marissa Loving was featured for her interest in the Loch Ness monster surface.



"As someone who studies surfaces for a living, I find it hard to pick a favorite. A common joke in my research area is that everyone's favorite surface is the genus 2 surface [a surface with two holes in it] because it's the lowest-genus (closed) hyperbolic surface and, as such, is often the default example drawn in lectures and talks. Although the genus 2 surface is quite special, I decided to share a little bit about a surface on the other end of the spectrum, an infinite-genus surface called the Loch Ness monster. The Loch Ness monster surface is arguably the "simplest" infinite-type

surface, yet its group of topological symmetries known as the mapping class group contains every countable group as a subgroup.

Even stronger, there exists a complete hyperbolic metric on the Loch Ness monster surface whose isometry group (the group of geometric symmetries) is G if and only if G is a countable group. So even though the Loch Ness monster surface may appear quite simple in the wild world of infinite-type surfaces, it captures some pretty neat phenomena. These cool facts were proved by Tarik Aougab of Haverford College, Priyam Patel of the University of Utah and Nicholas G. Vlamis of Queens College in New York City in a 2021 paper entitled "Isometry Groups of Infinite-Genus Hyperbolic Surfaces." – Marissa Kawehi Loving, University of Wisconsin–Madison



Affiliate Prof. Steve Wright to be plenary speaker at ICM 2026



Steve Wright, a Math affiliate and Chair of the Computer Sciences Department, will give a plenary talk at the International Congress of Mathematicians in Philadelphia in July 2026. Steve works in the area of optimization and data science.

Link: https://wrightstephen.github.io/sw_proj/



Hao Shen has won a Rollo Davidson Prize for his deep contributions to the theory of stochastic partial differential equations and the furthering of our understanding of the stochastic Yang-Mills dynamics.

This prize is awarded annually to young probabilists.

In Memoriam

Tom Kurtz



Thomas G. Kurtz passed away on Saturday, April 19, 2025. He will be deeply missed by the probability and statistics community and all who knew him.

Tom was born on July 14, 1941, in Kansas City, Missouri. He graduated from La Plata High School in La Plata, Missouri, in 1959. He earned his B.A. degree in Mathematics from the University of Missouri in 1963. He then pursued his Ph.D. in Mathematics at Stanford University, which he completed in 1967 under the supervision of James McGregor (Convergence of Operator Semigroups with Applications to Markov Processes).

In 1967, Tom joined the Department of Mathematics at the University of Wisconsin–Madison, where he remained for his entire career. He became a Professor of Mathematics in 1975 and received a joint appointment in the Statistics department in 1985. He served as the Mathematics Department Chair from 1985 to 1988 and as the Director of the Center for Mathematical Sciences from 1990 to 1996. In 1996, he was awarded the WARF–University Houses Professorship, which he chose to identify as the Paul Lévy Professorship to honor one of the founders of modern probability theory. Tom retired from active teaching in 2008 but continued to work as an emeritus professor.

Tom's research focused on the convergence, approximation, and representation of several

important classes of Markov processes. His findings have had a significant impact on various scientific disciplines, including systems biology, population genetics, telecommunications networks, and mathematical finance. Over his career, he published over 100 peer-reviewed articles (with three of them appearing in 2024!) and authored four books. His book titled Markov processes (joint with his former graduate student, Stewart Ethier) is one of the foundational works on the subject. Tom supervised 29 Ph.D. students and organized a Summer Internship Program in Probability in Madison for nearly a decade, significantly impacting a large number of probabilists.

Tom was a Fellow of the Institute of Mathematical Statistics, the American Academy of Arts and Sciences, and the American Mathematical Society. He served as the President of the Institute of Mathematical Statistics (2005–2006) and as the Editor of the Annals of Probability (2000–2002). He held several visiting positions around the world, including at Imperial College London, Goethe University Frankfurt, and the Isaac Newton Institute for Mathematical Sciences. He was also a trustee of the Mathematical Biosciences Institute in Columbus, Ohio.

Tom Kurtz was known for his dedication to his profession and his students. He was always generous with his time and expertise, he was an incredible resource for all things related to probability, and will be greatly missed.

Link: <https://go.wisc.edu/kurtzobit>

Jaap Korevaar

Jacob (Jaap) Korevaar has died, aged 102, in the Netherlands. He was a faculty member in our department from 1953 to 1964. He served as Chairman of the Program in Applied Mathematics and Engineering Physics from 1956–61 and Associate (and/or Acting) Chairman, Dept of Mathematics, 1962–64. He had 17 Ph.D. students. Korevaar's research broadly fell into the areas of complex analysis and approximation theory.

He was awarded several honors, including being made a Fellow of the American Mathematical Society in 2012, Lester R. Ford Prize (1987) and Chauvenet Prize (1989) from MAA, a Fellow of the American Association for the Advancement of Science (AAAS) in 1960, and held several roles in the Royal Netherlands' ACADEMY OF ARTS and Sciences (KNAW) concluding with a chairmanship of the mathematical section from 1994 to 1996.

Gen Novara

Gen Novara, former Department



Administrator of the Math Department (1977 to 2004), died recently. She is remembered as a kind and valued member of the department by many faculty, staff and students over the years.

Nigel Boston

The Notices of the American Mathematical Society published an appreciation of Nigel Boston's life and work in its June/July 2025 issue, <https://go.wisc.edu/boston-ams-notice>.

I. Martin Isaacs



On Monday, February 17, 2025, the UW math department lost an outstanding researcher and an award-winning teacher. Professor Emeritus I. Martin Isaacs succumbed to kidney failure. He was 84 years old and had been

living in Berkeley, California since his retirement.

Marty Isaacs was born on April 14, 1940 and brought up in the Bronx, New York. He attended the Bronx High School of Science where he was a member of the school math team. He learned calculus from the chairman of the math department who moonlighted in the evenings, teaching at the Polytechnic Institute of Brooklyn, a technical college now part of NYU. He convinced Marty to go there and so he did. In his senior year at Poly, Marty was on the school's winning Putnam team and he became a Putnam Fellow, placing in the top tier of individual winners. This got him admitted to Harvard graduate school with appropriate scholarships.

Marty was a graduate student at Harvard University from 1960 to 1964 where he studied with the famous Professor Richard Brauer who later received a National Medal of Science. His thesis concerned linear groups and a problem of Blichfeld. He received his PhD in June of 1964. That summer he planned to celebrate by sightseeing and driving throughout Europe. Unfortunately, he was in a serious automobile accident in France which left him disabled and disfigured. He spent several months in what is now called Hospital Cochin (the hospital where Galois died) before being returned to the United States. He then spent well over a year in the burn unit of Columbia Presbyterian Hospital in New

York City. A lesser person might have let this accident dampen his future. But Marty left the hospital, got on with his life, and never looked back.

Marty's first academic position was as an instructor for three years at the University of Chicago. He came to UW-Madison in 1969 as an Associate Professor in the math department with tenure and was awarded a Sloan Fellowship in 1971. That same year, he was promoted to Full Professor, at the age of 31. He remained in the UW math department until he retired in 2011.

Marty's main research interest was in finite group theory, although he worked in many other aspects of algebra. He was surely the world's leading expert on the character theory of finite groups. Among other things, he is known for the Glauberman-Isaacs character correspondence and his solution to the famous groups of central-type conjecture.

Furthermore, Marty began the study of character degrees and he made the first major advances on what is known as the Isaacs-Seitz conjecture. He and Persi Diaconis began supercharacter theory and his π -theory generalized the Brauer character theory on solvable groups. In addition, he has substantial theorems on M-groups and his results on the characters and conjugacy classes of upper triangular matrices initiated the more general study of groups associated with algebras.

In his later years, Marty returned to studying the McKay conjecture. Early on, in 1973, he made the first major advances towards proving it. In his more recent work with Gabriel Navarro, the conjecture was reformulated to better understand it. Then with Navarro and Gunter Malle, the problem was reduced to the case of simple groups, which was later handled by Cabanes, Spath and others. Thus, the McKay conjecture was finally proved.

During his career, Marty wrote over 200

research papers, and he was a member of the inaugural class of Fellows of the American Mathematical Society. In June 2009, a conference on character theory was held in his honor in Valencia, Spain.

In addition, Marty had always been passionate about teaching and exposition. He was quite possibly the best teacher in UW's math department, and he received numerous teaching awards. Indeed, he received the UW-Madison Distinguished Teaching Award in 1985, the Tau Beta Pi Teaching Award in 1988, the Benjamin Smith Reynolds Award for Teaching Engineering Students in 1989, the Wisconsin Section MAA Teaching Award in 1993 and the MAA Polya Lectureship in 2003–2005. Over the years, Marty mentored 29 PhD students, and wrote books on character theory, character theory of solvable groups, finite group theory, first year graduate algebra, and even one on geometry for college students. He recently endowed the "I. Martin Isaacs Prize for Excellence in Mathematical Writing" administered by the American Mathematical Society.

For 31 years, he oversaw the Mathematics Talent Search which offered challenging math problems to middle and high school students throughout the state and indeed the world. It is the department's leading and most well-known outreach program.

Marty is survived by his long-time companion Deborah Finch, his sister Rosalie Isaacs, his brother-in-law Alan Bross, his god-child Barbara Passman Brownsword, the rest of the Passman family, namely Marj, Don and Jon, and numerous friends and admirers in the mathematical community including Persi Diaconis, George Glauberman, Robert Guralnick, Mark Lewis, Gabriel Navarro, and of course his PhD students.

–Written by Don Passman



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The AMS Student Chapter Seminar (aka Donut Seminar) is an informal, graduate student seminar on a wide range of mathematical topics. The goal of the seminar is to promote community building and give graduate students an opportunity to communicate fun, accessible math to their peers in a stress-free (but not sugar-free) environment. This topic was "The Fold and Cut Theorem". Photo by Ethan Schondorf