FINE LETTERS

Department of MATHEMATICS

Fall 2025 * Issue 14

From the Chair

With another successful academic year in the books, I would like to extend my sincere congratulations to our new graduates who have earned their baccalaureate and PhD degrees this year. Reaching this immense milestone is a testament to your hard work and dedication, and I am confident that you will continue to thrive as you embark on the next exciting chapters of your academic and professional journeys.

Our department continues to grow and evolve with the exciting addition of four new assistant professors, three new instructors, and five new researchers joining us this fall. We were also fortunate to welcome Brittany King as the new Undergraduate Program Administrator. Brittany joined us shortly before the 2024–25 academic year, succeeding Michelle Matel, who retired in January after many years of invaluable service to the department.

While we have much to celebrate this year, it is with a heavy heart that I report the passing of Emeritus Professor William Browder, who passed away in February. Professor Browder earned his PhD in Mathematics here at Princeton in 1958, and returned in 1964 as a full professor of mathematics. Over the course of his distinguished career, he advised over thirty PhD students, served as President of the American Mathematical Society, and was a member of the National Academy of Sciences, the American Academy of Arts and Sciences, and the Finnish Society of Sciences and Letters. Bill retired in 2012 after nearly fifty years of dedicated service and many impressive contributions to the field of topology.

The Math Department had the privilege of hosting three Minerva Distinguished Visitors over the past year, who each delivered outstanding lecture series. In the fall, we welcomed Felix Otto, who gave a four-part minicourse titled “A critical drift-diffusion process: intermittent behavior.” In the spring, we were joined by Tom Mrowka, who presented a seven-part lecture series on “Instanton

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Photo by Will Crow

Class of 2027 Declaration Day — A Record Number of Math Majors

A discussion with Junior Math Advisor Mark McConnell

We are delighted to welcome 47 math majors from the class of ’27. That is a record for the department.

The number of math majors has been growing steadily over the last ten years. We hit a record of 39 with the class of ’23. Then COVID-19 appeared, and there were fewer math majors for several years. The pandemic lockdown was difficult for students everywhere. Learning on Zoom adds a layer of indirection. Talking about math with your friends online is not as effective as talking at the blackboard. It was harder for students to learn.

For the class of ’26, the numbers were back to 38 majors, and now there are 47 in the class of ’27.

As an advisor, I schedule a planning meeting with each incoming math major when they plan to declare in April. This year, they just kept flowing in, all of them with deep interest in mathematics and a strong sense of direction.

We are looking forward to excellent work from the math majors in ’26, ’27, and beyond.

From the Chair

Chair continued from page 1

homology for links and webs in 3-manifolds," and Gigliola Staffilani, whose six-part series covered "Periodic nonlinear Schrödinger equations and the evolution of its energy spectrum."

Once again, our faculty have demonstrated exceptional achievements in their fields, and have earned recognition through several prestigious honors and awards. Noga Alon received the Wolf Prize in Mathematics for his "profound impact on discrete mathematics and related areas," while János Kollár was awarded the János Bolyai International Mathematics Award for his invaluable impact on modern complex algebraic geometry. This year also saw the election of Peter Constantin as a Fellow of the European Academy of Sciences and Maria Chudnovsky as a Guggenheim Fellow, and Christopher Skinner was elected to the American Academy of Arts & Sciences. These honors reflect the ongoing excellence of our department.

As I look back on the past year, I am particularly impressed by the passion and determination demonstrated by our students, faculty, alumni, and staff, and warmed by the sense of community shared even beyond our Princeton circles. I look forward to seeing what we accomplish over the coming year, and am confident that the math department will continue to demonstrate a high level of intellectual curiosity and academic excellence.

Igor Rodn

Igor Rodnianski, Department Chair

Department Administration

Igor Rodnianski, Department Chair
János Kollár, Associate Chair, Director of Undergraduate Studies
Chenyang Xu, Director of Graduate Studies
Lue Pan, Assistant Director of Graduate Studies
Jennifer M. Johnson, Associate Director of Undergraduate Studies
Ana Menezes, Undergraduate Placement Officer
Alexandru Ionescu, Senior Advisor
Mark McConnell, Junior Advisor
Kathleen Applegate, Department Manager
Jill LeClair, Graduate Administrator
Brittany M. King, Undergraduate Administrator

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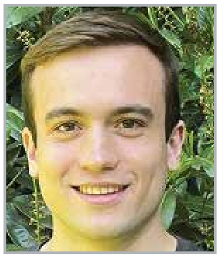
Photo by Maria Mastroianni

New Junior Faculty and Researchers

2025–2026 Faculty Appointments

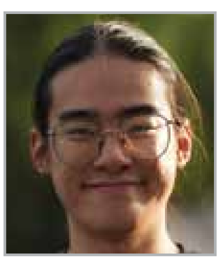


Lars Becker
Instructor
Harmonic Analysis
Ph.D. 2025, Universität Bonn

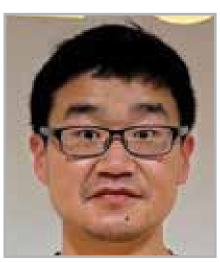
Guido Bosco
Assistant Professor
Algebraic Geometry, Number Theory
Ph.D. 2023, Sorbonne Université

Ryan Chen
Clay Fellow
Number Theory
Ph.D. 2025, Massachusetts Institute of Technology

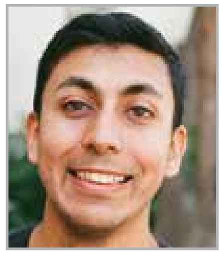
Jorge Garza-Vargas
Assistant Professor
Probability Theory & Stochastic Processes
Ph.D. 2022, University of California, Berkeley



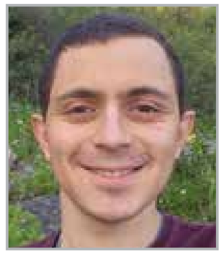
Zhongtian Hu
Postdoctoral Research Associate
Partial Differential Equations
Ph.D. 2025, Duke University



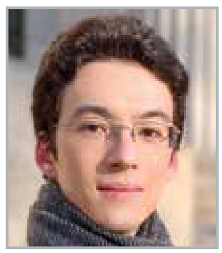
Chenzi Jin
Veblen Research Instructor
Kahler Geometry, Differential Geometry
Ph.D. 2025, University of Maryland, College Park



Rohil Prasad
Assistant Professor
Manifolds and Cell Complexes
Ph.D. 2023, Princeton University



Omri Solan
Associate Research Scholar/Bourgain Fellow
Dynamical Systems
Ph.D. 2025, Hebrew University of Jerusalem
The Bourgain Fellow is a joint position with the IAS.



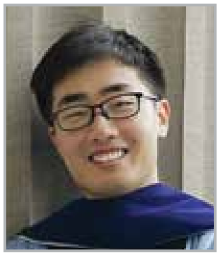
Jonathan Tidor
Assistant Professor
Combinatorics
Ph.D. 2022, Massachusetts Institute of Technology

Luya Wang
Postdoctoral Research Fellow
Low-Dimensional Topology and Symplectic Geometry
Ph.D. 2023, University of California, Berkeley

Xuan Yao
Postdoctoral Research Associate
Differential Geometry
Ph.D. 2025, Cornell University

New Junior Faculty and Researchers

2025–2026 Faculty Appointments



Baiqing Zhu

Instructor

Number Theory

Ph.D. 2025, Columbia University

PROMOTIONS

Anubhav Mukherjee

Assistant Professor

Low-dimensional Topology and Contact & Symplectic Geometry

Ph.D. 2022, Georgia Tech

Honors and Awards

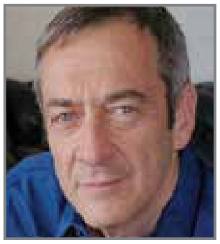
Faculty and Instructors

Ryan Chen

The Clay Mathematics Institute announced that Ryan Chen '19 has been awarded a Clay Research Fellowship. Chen received his PhD from MIT and will return to Princeton as a Clay Research Fellow. He focuses on themes surrounding the Gross–Zagier-type formula for high-dimensional Shimura varieties, where the main aim is to relate the arithmetic intersection numbers of algebraic cycles to the special values of L-functions and their derivatives.

Maria Chudnovsky

The John Simon Guggenheim Memorial Foundation announced on April 15, 2025, their appointment of the 100th class of Guggenheim Fellows. Maria Chudnovsky is among 198 distinguished individuals working across 53 disciplines chosen this year. The Fellows were chosen through a rigorous application and peer review process from nearly 3,500 applicants. The 100th class of Fellows is part of the Guggenheim Foundation's yearlong celebration marking a century of transformative impact on American intellectual and cultural life.



Peter Constantin

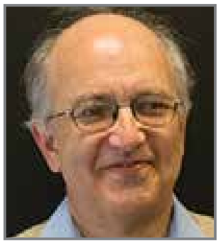
Professor Peter Constantin has been elected as a 2025 Fellow of the European Academy of Sciences, EurASc, in their Mathematics Division. The Academy rewards excellence in science and technology by electing to its Fellowship and Honorary Membership and by awarding the Academy's medals to the brightest professorial and postdoctoral science researchers who perform cutting edge research.

Ingrid Daubechies

Ingrid Daubechies, Professor Emeritus, is one of the five Princetonian recipients honored with the 2025 National Medal of Science. Established in 1959 by the U.S. Congress, the National Medal of Science is the highest recognition the nation can bestow on scientists and engineers. This presidential award is given to individuals deserving of special recognition by reason of their outstanding contributions to knowledge in the physical, biological, mathematical, engineering, or social and behavioral sciences, in service to the Nation.

Honors and Awards

Faculty and Instructors



János Kollár

Professor János Kollár received the prestigious János Bolyai International Mathematics Award by the Hungarian Academy of Sciences. This prestigious award is given every five years to the author of the most outstanding and groundbreaking mathematical monograph of breakthrough significance, presenting new results and methods of the author's own, published anywhere and in any language in the previous fifteen years, taking into account the author's previous scientific work. According to the committee responsible for the award, János Kollár's achievements have had an invaluable impact on modern complex algebraic geometry.

Melanie Matchett Wood

Melanie Matchett Wood of Harvard University, who earned her Ph.D. at Princeton in 2009, is among six current Princetonians and at least 14 researchers affiliated with the University to receive the 2024 Presidential Early Career Award for Scientists and Engineers (PECASE). President Biden presented these awards on January 14. PECASE is the highest honor given by the U.S. Government to early career science and engineering professionals.

Christopher Skinner

The 2025 American Academy of Arts & Sciences has named Christopher Skinner one of seven newly elected members honored in the Mathematical and Physical Sciences. The Academy's elected members join with other experts in cross-disciplinary efforts to produce reflective, independent, and pragmatic studies that inform public policy and advance the public good.

Photo: Sameer Khan, IAS

Anna Skorobogatova

Former graduate student Anna Skorobogatova *24, has been awarded a Clay Research Fellow. Skorobogatova, is currently an ETH-ITS Junior Fellow at ETH Zürich. She has made fundamental contributions to the regularity theory of minimal surfaces and to the structural understanding of their singularities.

Naomi Sweeting

Naomi Sweeting, Postdoctoral Fellow, along with Yvonne Alama Bronsard and Agustina Czenky, received the ninth annual Association for Women in Mathematics Dissertation prize, which was presented at the Joint Prize Session at the 2025 Joint Mathematics Meetings in Seattle, WA. The AWM Dissertation Prize, established in 2016, honors up to three outstanding Ph.D. dissertations presented by female mathematical scientists and defended during the 24 months preceding the deliberations for the award. It is intended to be based entirely on the dissertation itself, not on other work of the individual.

William Browder *58 | 1934 – 2025

Bill Browder, influential and inspiring figure in mathematics, dies at 91

By Liz Fuller-Wright, Office of Communications

William "Bill" Browder, an emeritus professor of mathematics, died in early February at the age of 91. He died at home, excited about a new math idea he'd just had, held in his wife's arms.

"Bill Browder was a kind and generous man who not only contributed greatly to the mathematics literature, but also greatly to the societal aspects of the mathematics community, as president of the American Mathematical Society and in many other ways," said Elliott Lieb, Princeton's Eugene Higgins Professor of Physics, Emeritus, and an emeritus professor of mathematical physics. "It was one of the high points of my own career to have had the opportunity to interact with him as a valued friend and coworker."

Browder was known to his colleagues as a leading topologist and one of the inventors of surgery theory, which unifies methods and techniques from several branches of topology and brings them to bear on the classification of manifolds. His colleagues described his many mathematical contributions in detail when Browder retired in 2012.

Browder first came to Princeton in 1954 as a graduate student, having recently completed his undergraduate studies at the Massachusetts Institute of Technology (MIT). Browder finished his Ph.D. at Princeton in 1958, then taught at the University of Rochester, the University of Oxford and Cornell University before returning to Princeton, where he was a member of the Institute for Advanced Study in 1963–64. In February 1964, Browder joined the Princeton University faculty as a full professor. At the time, the 30-year-old was the youngest full professor in the history of Princeton's storied mathematics department. Browder served in many roles, including department chair and director of graduate studies, over the course of his half-century Princeton career.

"Bill was an influential mathematician, a wonderful person, and a dear friend. As my Ph.D. adviser at Princeton, he introduced me to the beauty of algebraic topology," said Alejandro Adem, a 1986 Ph.D. graduate of Princeton and a professor of mathematics at the University of British Columbia. "I first met him in 1981, at a conference in Mexico. What most impressed me about him was that he was a person who was kind, approachable and most importantly had a great sense of humor. At Princeton, he was a supportive and caring adviser who never micromanaged but also never neglected his students."

Browder was born in January 1934 in New York to two lawyers, Raissa and Earl Browder. Raissa, a Jewish woman from Saint Petersburg, Russia, met American Communist Party leader Earl Browder, from Wichita, Kansas, when Earl lived in Moscow in the mid-1920s. They did not speak each other's languages, but Raissa was won over by Earl's sweetness to children, according to family stories. Raissa came to the U.S. in 1933, heavily pregnant with Bill, while Earl was on a speaking tour.

The family settled in New York, where the three Browder boys attended local public schools before leaving New York for MIT. Two of them continued on to Princeton for graduate studies.

During his 60 years in Princeton, Bill Browder advised 34 Ph.D. students and numerous undergraduates who went on to brilliant mathematical careers, including at least one recipient each of the Fields Medal, the Abel Prize, the Wolf Prize and two recipients of the National Medal of Science.

"Bill was an adviser par excellence, showing us great math with great opportunities at the cutting edge," said Dennis Sullivan, a 1966 Ph.D. graduate and 2004 National Medal of Science laureate who is now the Albert Einstein Chair at the Graduate Center of the City University of New York and a distinguished professor State University of New York-Stony Brook. "He showed us how to classify closed manifolds in terms of homotopy invariants from algebraic topology. It was amazing."

During the late 1970s, Browder served as chair of the Office of Mathematical Sciences of the National Research Council. He helped establish the David Committee, which was charged with investigating the underfunding of mathematical research in the U.S. The committee's report marked a turning point in the funding of mathematics, and it was later used as a basis for briefings for the White House and for the Pentagon.

"When I first came to Princeton as a graduate student in 1989, I was somewhat lost, not knowing which mathematical path I would take," said Peter Ozsváth, a 1994 Ph.D. graduate who is now Princeton's Sheila and David Manischewitz '59 Professor of Mathematics. "With his characteristic laid-back enthusiasm, Bill encouraged me to study the exciting new world of four-dimensional topology. It was not his area of expertise, [so] Bill encouraged me to find experts in the field to help me find a thesis problem. I had the great fortune to end up working with John Morgan at Columbia, but that belongs to another story.

"After that, my primary relationship with Bill was through music, lasting long past my graduate student days. Bill was an avid flute player, who organized amazing chamber music bashes about once a month at his house. We checked out a shelf-full of scores of music from the music library, and then he would invite over to his house all the musically inclined mathematicians, having us play, both with him and without him. I remember sessions that lasted from 1 p.m. to 1 a.m.! There was always a break for a massive feast Bill would prepare, sometimes with traditional Danish food. He was an inspiring figure, the last of the great homotopy theorists at Princeton. He will be greatly missed."

Among his many honors, Browder was a member of the American Academy of Arts and Sciences, the U.S. National Academy of Sciences, and the Finnish Academy of Science and Letters. He was editor of the Annals of Mathematics from 1969 to 1981. Browder and his older brother Felix, himself a Princeton Ph.D. graduate in 1948, were two of the inaugural fellows of the American Mathematical Society. Bill served as the AMS president from January 1989 to December 1990, with Felix following in his footsteps a decade later (1999–2000).

Browder is survived by his wife, Lisbeth Moeller; his children Risa, Dan and Emil Browder; five grandchildren, ranging in age from infancy to 35 years old; and several nieces and nephews (including his namesake Bill Browder). He was predeceased by his brothers Felix *48 and Andrew, both eminent mathematicians.

Visit our website for an obituary update on
math.princeton.edu

Undergraduate Program

Undergraduate Student Updates

Undergraduate Student Profile

Sophia Huellstrunk

Hi, my name is Sophia. When I started at Princeton, I was interested in lots of subjects, especially history and biology. However, when I initially saw proofs in my first math class (MAT 215), I realized that mathematics was much more beautiful, expansive, and powerful than I had thought based on computational high school math classes. During my whole first semester, I rewired my brain to think mathematically, and I also found myself simultaneously enjoying concepts in physics. Over my four years, I took courses in a wide variety of mathematical fields and later focused on topics like algebraic number theory, representation theory, and algebraic geometry, as well as taking many related quantum physics classes (including quantum field theory). In addition, I was lucky to work with wonderful professors and graduate students on research projects. I ended up conducting independent work every summer and academic year, and am grateful to all of my research mentors, including graduate students Eric Chen and Douglas Stryker for the directed reading program, and Professors Szabó, Kelleher, and Shapiro in junior and senior year. In particular, I greatly enjoyed working with Professor Shapiro on my senior thesis, which was in mathematical physics related to the tenfold way and Clifford algebras with applications in condensed matter physics. Continuing with my PhD in math at UPenn next year, I am especially excited to explore algebraic geometry and mathematical physics in both coursework and research.

Aside from math, I love to sing. At Princeton, I sang in Glee club, chamber choir, and consort. I also had the joy of playing queen of the night in The Magic Flute opera by Mozart and singing an hour-long senior recital! I've enjoyed meeting many people in the math community through the math department recital, teatime, as well as a math mentorship program for women+ I started this year. I also like to run and hike, and (am still learning to) cook in a Coop with my friends.

Recap: Undergraduate Studies

The academic year began with orientation workshops for the incoming first-year students. These workshops have evolved over the past years to assist students in finding the right starting point for their mathematics coursework. The incoming students select one of three workshops, depending on their likely placement. The first group is for students who consider (MAT100/103/175), the second for those with likely placement (MAT104/201/202/203/204), and the third for those with potential interest in majoring in mathematics (MAT210/214/215/216).

In April, the Department welcomed 47 new sophomore majors, the highest number in recent years. The year closed on May 26, when the seniors received their degrees and prizes.

The Math Department launched the minor in mathematics during the 2024–2025 academic year, with Mark McConnell as the Minor Program Director. There was very substantial interest, 54 students (juniors and seniors) enrolled in the first year.

The mathematics minor provides a structure that encourages students to explore mathematical ideas for their own sake in an open-minded, intellectually curious way, which is the primary goal of a liberal arts education. The program allows for students to either supplement work in their major field of concentration, or to explore new directions.

Most of the mathematics minors major in a closely related field, but there are also students from the humanities and social sciences, who enjoy learning math and would like to continue to explore more advanced ideas in mathematics.

Graduate Student Profile

Katharine Woo

My research interests lie in number theory – specifically in the distribution of prime numbers and solutions to Diophantine equations. Recently, I have been entranced by the multivariate generalization of the Bateman-Horn conjecture, which asks if a multivariate irreducible polynomial attains infinitely many prime values? If so, can we estimate the corresponding prime counting functions?

During my graduate studies, I worked on these problems about primes as well as connections between counting rational points on varieties and the theory of automorphic forms. My research and philosophy towards research have been influenced by my advisor, Peter Sarnak, in a way that likely would not have happened had I not come to Princeton. Freeman Dyson once claimed that all mathematicians are either birds or frogs – birds fly over the landscape of mathematics and can bring together a diverse set of ideas, while frogs live on this landscape and delight in truly understanding the details of their pond that may not be visible from the sky. I entered graduate school as a baby frog. I believe most people would categorize my advisor as a bird-type mathematician, and it is through his passion for a wide array of ideas that I began to truly appreciate all of the areas of mathematics and the connections between them; now I would like to think of myself as a young fledgling.

The COVID-19 pandemic greatly shaped my early graduate school experience. When I moved to Princeton in 2020, I had never lived more than an easy bike ride away from my parents before, and I was worried about finding community in the midst of a pandemic. While there were certainly unfortunate parts of starting in quarantine, I was welcomed by the number theory graduate students with weekly virtual teas and made friends with my cohort as we formed our own bubble. One of the events that I am most proud of from the last five years is working with the Graduate Student Committee to restart the department socials, first outdoors and finally back in the Professor's Lounge. These communities were important for me to lean on during the rollercoaster of research, and I learned through this experience that you can create a community in even a less-than-optimal circumstance.

Next, I will be heading home to be a postdoc at Stanford for a year before embarking on a new adventure in Switzerland to be a postdoc at ETH Zürich! My experience at Princeton was undoubtedly a wonderful one – it is truly a unique place to be a graduate student, surrounded by stimulating conversation and experts all around. I will miss all the friends I made, the irreplaceable wisdom of the faculty members, and the near bird's-eye-view from the Professor's Lounge.

A Message from the Director of Graduate Studies

Chenyang Xu

As we conclude the 2024–2025 academic year, I am pleased to reflect on the achievements and developments in our graduate program in the Department of Mathematics at Princeton University.

Now in my third year as Director of Graduate Studies, I continue to be impressed by the talent, dedication, and energy of our students. We are excited to welcome 18 new graduate students in the upcoming academic year, drawn from leading institutions around the world—including an impressive 7 from the top 10. Their excellent academic

Continued on next page

2025 Undergraduate Mathematics Prizes

The Andrew H. Brown Prize:
awarded to the outstanding juniors in mathematics

Akshat Agarwal '26
Elie Belkin '26
Kareem Jaber '26
Kaivalya Kulkarni '26

The Peter A. Greenberg '77 Prize
awarded for outstanding accomplishments in mathematics by juniors

David Fischer '26
Claire Kaneshiro '26
Julian Shah '26

The George B. Covington Prize in Mathematics
awarded for excellence in mathematics

Stephen Bartell '25

The Middleton Miller '29 Prize
awarded for the best independent work in mathematics

Michael Cheng '25
Jack Gallahan '25

The Sigma Xi Book Award for Outstanding Research
awarded for outstanding research accomplishments in mathematics

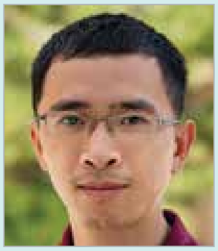
Icey Siyi Ai '25
Aaron Serianni '25

Inducted into Sigma Xi

Icey Siyi Ai '25
Stephen Bartell '25
Alexander Dreger '25
Rahma Elsheikh '25
Sophia Huellstrunk '25
Max Lind '25
Aaron Serianni '25

Alumni News

Melanie Matchett Wood, *09, has been recognized as a new alumni member of the National Academy of Sciences.



Ziquan Zhuang, *19, has been awarded the 2024 Packard Fellowship for Science and Engineering.

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backgrounds and strong intellectual promise will further enrich our community.

The selection process was rigorous, involving a three-stage evaluation: two initial review meetings conducted by a committee of eight faculty members, followed by final deliberations at a full departmental meeting.

The Graduate Student Committee has played a vital role in fostering a supportive and engaging environment. Their work in organizing seminars and hosting events, such as the Open House for prospective students, has been instrumental in maintaining the vibrancy and collegial spirit of our program.

The broader landscape of higher education in the United States continues to face substantial challenges. These circumstances have only reinforced the importance of adaptability and resilience within academic institutions. At Princeton, we remain steadfast in our commitment to supporting our graduate students through these uncertain times.

On behalf of the graduate program team, including Assistant Director Lue Pan and Graduate Program Administrator Jill LeClair, I extend my warmest congratulations to our graduating students. May the experiences and knowledge you've gained at Princeton provide a strong foundation for your future endeavors. Fine Hall will always be your academic home.

Recent Ph.D.'s

NAME	ADVISER	THESIS TITLE	ORIGINAL PLACEMENT & POSITION
Ian Fleschler	De Lellis (IAS)	Boundary regularity for area-minimiz-ing currents	Universitat Autònoma de Barcelona; Postdoctoral Researcher
Trajan Hammonds	Venkatesh	Non-Archimedean relative characters and the orbit method	Aarhus University, Denmark; Postdoctoral Researcher (2025-26); MIT; NSF Postdoctoral Research Fellow (2026)
Kexin Jin	Ionescu	Long-time dynamics of differential equations in Physics and AI	Morgan Stanley (NY); Quantitative Researcher
Isabella Khan	Ozsváth	Koszul dual bordered algebras and the wrapped Fukaya category	MIT; Simons Postdoctoral Associate
Georgios Kotsovolis	Sarnak	The bass note spectrum problem for binary and ternary forms	TBD
Noah Kravitz	Alon	Combinatorics with a view towards number theory	University of Oxford; Career Development Research Fellow; NSF MSPRF
Warren Li	Dafermos	Spacelike singularities in general relativity and the BKL proposal	Stanford University; Stanford Science Fellow
Shikhin Sethi	Ozsváth	Bordered Heegaard Floer modules for satellite operations using planar graphs	Princeton University; Lecturer
Jaydeep Singh	Rodnianski	Regimes of (in-)stability for self-similar naked singularities	Princeton University; Lecturer
Doug Stryker	Marques	Stability for area in codimension one	Stanford University; Postdoctoral Scholar; NSF MSRFP (2025–26); ETH Zurich; Hermann-Weyl Instructor (2026)
Maciej Wlodek	Pardon	Bordered Legendrian rational symplectic field theory	TBD
Katharine Woo	Sarnak	Counting rational points on low-degree del Pezzo surfaces with automorphic forms	Stanford University; NSF Postdoctoral Research Fellow (2025–26); ETH Zurich; ITS Junior Fellow (2026)

Events

2024–2025

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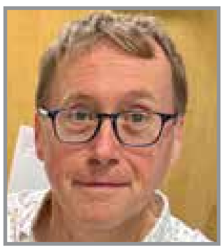
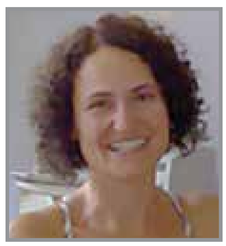
Minerva Lectures

The department hosted the Minerva Lectures series in the fall of 2024. **Dr. Alessio Figalli**, Professor at ETH Zürich and a member of the Institute of Advanced Study (IAS), delivered a series of talks on "Advances in Free Boundary Regularity in Obstacle Problems," offering an overview of classical and recent advancements in the regularity theory of obstacle problems. Since 2019, Figalli has been serving as the Director of the FIM - Institute for Mathematical Research and received several prestigious awards, including the Fields Medal in 2018 and three doctorate honoris causa.

Minerva Distinguished Visitors

During the 2024–25 academic year, the department had the privilege of hosting three Minerva Distinguished Visitors — **Felix Otto**, Max-Planck Institute for Mathematics in the Sciences, Leipzig; **Tomasz Mrowka**, Massachusetts Institute of Technology; and **Gigliola Staffilani**, Massachusetts Institute of Technology. This program allows leading mathematicians to spend several months in the department, engaging with our faculty and students. During their stay, these distinguished visitors provide talks in their respective fields.





Horizons Lectures Series

The Horizons Lectures were founded in 2021 as part of the department's Climate and Inclusion Committee. This lecture series consists of two events, a research colloquium and a seminar discussion on the societal impacts of the mathematics profession with the following goals:

- To discuss issues of access, inclusion, and success in STEM fields.
- To provide career guidance to graduate students and junior faculty.
- To recognize outstanding contributions of mathematicians from non-traditional backgrounds.

Photo by Maria Mastroianni

Speakers are invited to discuss a topic of their choice. Whether it's to share their academic journey, discuss their experiences mentoring and developing curricula that meet students' needs, or the challenges building an equitable mathematical community.

The Fall 2024 Horizons Lectures Series took place throughout the week of December 2 with Horizons Lecturer **Federico Ardila-Mantilla**, Professor at San Francisco State University and panelists **Haydee Lindo**, Associate Professor at Harvey Mudd College, and **José Mijares-Palacios**, Professor at California State University, Los Angeles. Ardila-Mantilla provided a PACM Colloquium talk on *The Combinatorics of CAT(0) Cube Complexes.* Lindo provided a talk on *Trace ideals and applications* and Mijares-Palacios on *Towards quantum Ramsey theory.* Together, they had an open discussion on their perspectives called *Becoming Minority Mathematicians: a Conversation.* All events were actively attended by students, faculty, staff, and the math community.

West Point Cadets

Photo by Ali Zaidi

On February 21, 2025, fifteen West Point Military Academy cadets and five members of their faculty visited Princeton to participate in a special program arranged by Professor Akshat Das of West Point and David Gabai of Princeton with the assistance of Peter Sarnak and Paul Yang. Three short talks were given by Sergiu Klainerman on the *Magic and power of partial differential equations*, Susanna Haziot on *Mathematical modeling: the blood flow through the human heart*, and David Gabai on *Topology*. This was followed by a wide-ranging discussion between the Cadets and the Princeton faculty members, e.g. how to prepare for a research career, how to go about finding direction and approaching research problems and how to balance research careers with life's challenges. The discussion was quite lively in part because of the vastly different ways these faculty think and their unique pathways to Princeton.

Fluids and Computer Assisted Proofs
A NSF-FRG Collaboration

The conference took place on March 14 - March 16 at Fine Hall and was part of the NSF-FRG collaboration grant "Singularities in Incompressible Flows: Computer Assisted Proofs and Physics-Informed Neural Networks." The main goal of the grant is to bring together experts in both numerical and theoretical mathematics and to design and implement methods that allow us to connect numerical simulations and computer-assisted proofs. The conference program consisted of 12 lectures given by both junior and senior researchers and a discussion moderated by the organizers on the applications of PINNs and computers assisted proofs.

Organizers: Tristan Buckmaster, NYU, Javier Gómez-Serrano, Brown, Hao Jia, U. Minnesota, Ching-Yao Lai, Stanford, and Alexandru Ionescu, Princeton.

Low-dimensional topology, dynamics, Floer homology, and higher algebra
A Simons Collaboration Satellite Conference

The conference took place on March 24–26, 2025, at McDonnell Hall and was funded by the Simons Collaboration Grant, with co-PIs including Ozsváth and Szabó, along with 11 other co-PIs worldwide. It focused on exciting new developments at the crossroads between low-dimensional topology, gauge theory, symplectic geometry, algebra, and dynamics. Over the course of three days, there were 12 speakers representing these various areas. The conference was a satellite event for a subsequent conference in New York City organized by the PIs.

Photo by Katharine Woo

The Math Department's annual soccer game on October 27, 2024 was a highly attended event, organized by Anubhav Mukherjee and Serban Cicortas.

Events

2024–2025

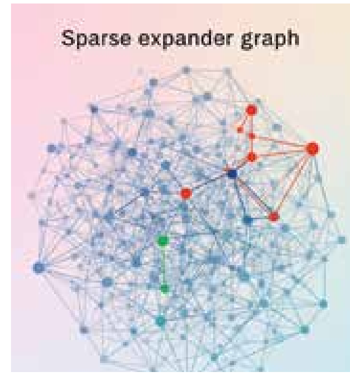
Department of Mathematics Spring Recital April 17, 2025


Photo by Jill LeClair

It was a special year end celebration that evening as our talented students, faculty, and guests showcased their skills and passion in Taplin Auditorium. We would like to thank Jill LeClair, Graduate Administrator, for the well-executed organization and remarkable attention to detail in planning the performance. The program included a variety of songs performed by undergraduates Sophia Huellstrunk, Kodai Speich, Kaivalya Kulkarni, Owen Yang, Jisang Kymm, Sarah Yuan; graduate students Anthony Coniglio, Alper Gunes, Daniel Levy, Matthew Jordan, Andy Zhang; Assistant Professor Susanna Haziot, Senior Lecturer Mark McConnell, Professor Peter Ozsváth; Director, Princeton University Concerts/Music Department Marna Seltzer; Undergraduate Program Administrator Brittany King; and special guest Eli Ozsváth.

Graph Expansion and its Applications

The conference took place on April 26–May 2, 2025, at Fine Hall which included several days of workshops. The department of mathematics hosted a weekend conference on Graph expansion and its applications and a tie-in workshop on Graph theory and beyond organized by Matija Bucic. There were over 20 talks on a wide variety of topics related to expander graphs and related topics given by the participants who ranged from world experts to graduate students and included connections and applications to theoretical computer science, geometry, additive number theory, structural graph theory and a number of other areas. During the workshop week several groups collaborated on a wide variety of open problems in the area.



Speakers:

- Noga Alon, Princeton
- Adrian Beker, U. Zagreb
- Maria Chudnovsky, Princeton
- Irit Dinur, IAS
- Nemanja Draganic, Oxford
- Zhongtian He, Princeton
- Oliver Janzer, EPFL
- Zhihan Jin, ETH Zurich
- Pravesh Kothari, Princeton
- Michael Krivelevich, Tel Aviv
- Hong Liu, IBS Korea
- Tung Nguyen, Princeton
- Jinyoung Park, NYU
- Alexey Pokrovskiy, UCL
- Thatchaphol Saranurak, U. Michigan
- Mehtaab Sawhney, Columbia
- Paul Seymour, Princeton
- Avi Wigderson, IAS
- Liana Yepremyan, Emory
- Dmitrii Zakharov, MIT
- Abhishek Methuku, UIUC
- Assaf Naor, Princeton


Photo by Andrea Kane

Women+ and Mathematics

The conference, "Convexity and Combinatorics in Algebraic Geometry," took place at Princeton University and the Institute for Advanced Study on May 18–23, 2025. The department hosted Women + and Mathematics Princeton Day on May 21 at Fine Hall. The event featured a full day of engaging lectures. Participants also enjoyed the popular

walking tour, where they explored historical sites and listened to some captivating stories, followed by a visit to the charming downtown area of Princeton.

Speakers:

Kimoi Kemboi, Princeton
Maria Chudnovsky, Princeton
June Huh, Princeton

Organizers:

Wei Ho, Princeton, IAS, Michigan
Maria Chudnovsky, Princeton
Casey Kelleher, Princeton
Ana Menezes, Princeton

Photo by Seoyeon Yang

Noetherian Ring Lecture Series

The Noetherian Ring mentoring program was a great success this year, pairing undergraduate women and non-binary math majors with graduate student mentors. A highlight this March was a Q&A panel about the math major for interested underclassmen which was highly attended. Additionally, the Noetherian Ring has continued its lecture series with the IAS, which features women and nonbinary faculty presenting their research areas in an accessible manner to both undergraduate and graduate students.

Take Your Child to Work Day

The Departments of Mathematics, Chemistry, and Astrophysical Sciences, the Program for Applied & Computational Mathematics (PACM), and the Princeton Institute for Computational Science & Engineering (PICSciE) hosted a day of exploration, hands-on activities, and mind-blowing science on April 24, 2025. It was a day filled with laughter and learning as the children asked questions and experienced their parents' workspace. Pictured is Professor Peter Ozsváth,

Photo credit to Katharine Lamos

sharing teachings the five Platonic solids (the tetrahedron, the cube, the octahedron, the dodecahedron, and the icosahedron), and went from there to properties of the Euler characteristic of the sphere.

"Elliptic Curve 'Murmurations' Found With AI Take Flight"

This article includes innovative work in murmuration patterns in modular forms by Nina Zubrilina *24. https://www.quantamagazine.org/elliptic-curve-murmurations-found-with-ai-take-flight-20240305/

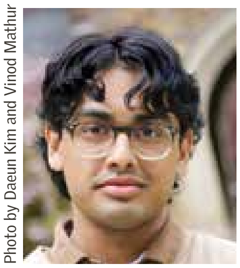


Photo by Daeun Kim and Vinod Mathur

Kaivalya Kulkarni '26 named Goldwater Scholar. The annual award recognizes "outstanding undergraduates interested in pursuing research careers in the sciences, engineering, and mathematics.

Minerva Distinguished Visitors

The Distinguished Visitor is a department appointment allowing top mathematicians to pursue and share ongoing projects with colleagues at Princeton.

Fall Semester 2025 & Spring 2026:

Robert Lipshitz, University of Oregon

Minerva Lecture Series

Fall Semester 2025:

Hong Wang, NYU Courant Institute of Mathematical Sciences and IHES
Joshua Zahl, Chern Institute of Mathematics, Nankai University

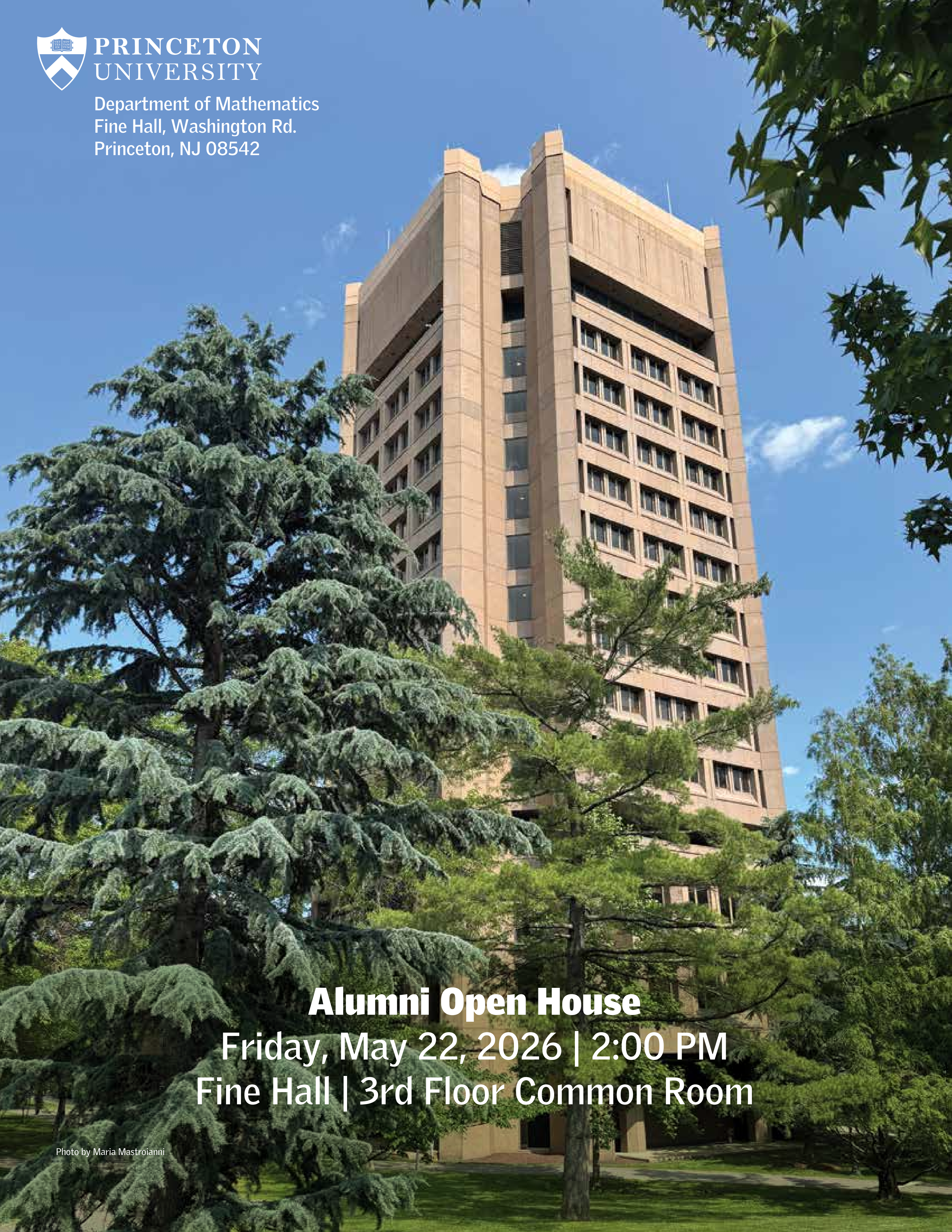
Spring Semester 2026:

Ben Green, University of Oxford

Women+ and Mathematics

— Princeton Day

Fine Hall 314 | 10:00 AM – 5:00 PM
May 20, 2026


PRINCETON
UNIVERSITY
Department of Mathematics
Fine Hall, Washington Rd.
Princeton, NJ 08542
Alumni Open House
Friday, May 22, 2026 | 2:00 PM
Fine Hall | 3rd Floor Common Room
Photo by Maria Mastroianni