



From the Chair

As we conclude another successful academic year, I extend my heartfelt congratulations to the undergraduate and graduate Class of 2024, who have completed their studies over the last few months. Your hard work and dedication have paid off, and I am confident that you will make substantial contributions to the field of mathematics in your future academic and professional endeavors.

This year, as always, we had the pleasure of welcoming an outstanding group of distinguished mathematicians to our faculty and research ranks. As we embark on the 2024-2025 academic year, we are excited to welcome four new assistant professors, five new instructors, and nine new researchers to the department. Additionally, we are pleased to introduce Erika Washburn-Kolczynski, who joined our administrative office in January as our new Department Office Support. Other changes to our administrative team include Maria Mastroianni's transition to her new role as Communications Specialist and Events Manager, and Ankit Tak taking over the role of Faculty Assistant and Seminar Coordinator. I look forward to seeing how we continue to grow as a department.

While we celebrate these new additions, it is with great sadness that I share the passing of Joseph Kohn in September at the age of 91. Professor Kohn spent nearly his entire career at Princeton beginning as a graduate student and transitioning to emeritus status in 2008. His work in mathematical analysis and his mentorship of many students have left an indelible mark on our community. Among his many accolades, he was awarded the Steele Prize in 1979, the Stefan Bergman Prize in 2004, and was elected to the American Academy of Arts and Sciences, and the National Academy of Sciences.

In the Fall of 2023, we had the honor of hosting Tarek Elgindi, Alexander Lubotzky, Felix Otto, and Pierre Raphael as Minerva Distinguished Visitors. In the Spring

Continued on next page

Math Minor Now Open for Enrollment

The program's goal is to allow students to explore contemporary mathematics, either as a topic for its own sake or to gain a deeper knowledge of a specific area most relevant to the student's work in their major field of concentration. In consultation with the Minor Program Director of the Math Department, the student should develop a plan that complements their work in their chosen field of concentration. The plan can be to gain a broad knowledge of mathematics, in which case we recommend courses in algebra, complex analysis, and real analysis. Alternatively, students with a strong interest in a more specialized area of mathematics can choose a sequence of courses in that field.

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 both a minor in math that supplements students' work in their major field of concentration and a minor in math that will enable students to explore new directions. A student who decides to minor in mathematics might want to learn more math because they have always been curious and enthusiastic math learners and want to build a deeper understanding of the mathematical ideas present throughout their work in their chosen disciplines. We also welcome students from the humanities or social sciences who have enjoyed learning math and would like to continue to explore more advanced ideas in mathematics, whether or not they are directly relevant to their major work.

The minor requires four Mathematics department courses at the 300-level or higher. By permission, one of these can be a cognate if it fits into the student's plan and is approved in advance. These courses cannot be counted toward the student's major or towards other minors.

In addition to the four Mathematics department courses, one junior seminar offered by the department is required, which can be taken either in the junior or senior year.

From the Chair

Chair continued from page 1

semester, Benson Farb delivered a compelling Minerva Lecture Series titled "Mapping Class Groups of $K3$ Surfaces from a Thurstonian Viewpoint." We also hosted numerous exciting events, including the "Monodromy and Its Applications" conference honoring Nicholas Katz's 80th birthday in December, which featured a University Public Lecture by Cynthia Dwork. In June, we celebrated Peter Sarnak's work and impact with the "Visions in Arithmetic and Beyond" conference.

Our distinguished faculty continue to garner significant accolades in the field. To highlight a few, Peter Sarnak was awarded the 2024 Shaw Prize, Ian Zemke was named a Sloan Research Fellow, Bhargav Bhatt received the 2023 Infosys Prize in Mathematical Science, and Maria Chudnovsky was named a 2024 AMS Fellow. These awards reflect the significant contributions our faculty members continue to make to the field of mathematics.

As we gear up for the start of another year, I am continually inspired by our dedicated faculty, staff, alumni, and students, whose efforts contribute immensely to our department's vibrancy and success. Your unwavering support is invaluable, and I look forward to seeing many of you at future departmental events.

Igor Rodn

Igor Rodnianski, Department Chair

Department Administration

Igor Rodnianski, Chair

János Kollár, Associate Chair

Chenyang Xu, Director of Graduate Studies

Lue Pan, Assistant Director of Graduate Studies

János Kollár, Director of Undergraduate 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

Michelle Matel, Undergraduate Administrator

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Princeton FH Plaza 5 disks

New Junior Faculty and Researchers

New Senior Faculty



Will Sawin *16

Joined the Department of Mathematics as the inaugural Luisa and Robert Fernholz '62 Professor of Mathematics on January 1, 2024. This new professorship was established by a gift from Luisa and Robert Fernholz '62. Before coming to Princeton, Sawin was appointed Associate Professor of Mathematics at Columbia University.

Sawin's research relates to the applications of étale cohomology to analytic number theory via exponential sums, the slice rank method in combinatorics, equidistribution questions in algebraic number theory, and other areas.

Sawin received his Ph.D. in Mathematics from Princeton University in 2016, where he worked under the supervision of Nicholas M. Katz.

His awards include the 2023 Sloan Research Fellowship, the 2021 SASTRA Ramanujan Prize and a three-year Clay Mathematics Institute Research Fellowship (awarded in 2018).

2024-2025 Faculty Appointments



Bjoern Bringmann

Assistant Professor

Partial Differential Equations

Ph.D. 2021, University of California, Los Angeles



Susanna V. Haziot

Assistant Professor

Nonlinear partial differential equations

Ph.D. 2021, University of Vienna

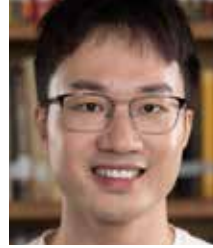


Marc Auréle Gilles

Assistant Professor

Numerical Linear Algebra

Ph.D. 2019, Cornell University



Tongmu He

Instructor

Arithmetic and Algebraic Geometry

Ph.D. 2023, Institute of Advanced Scientific Studies Université Paris-Saclay



Sepehr Hajebi

Instructor

Combinatorics and Optimization

Ph.D. 2024, University of Waterloo



Casey Kelleher

Associate Research Scholar

Geometric Analysis

Ph.D. 2017, University of California, Irvine

New Junior Faculty and Researchers

2024-2025 Faculty Appointments



Kimoi Kemboi
Instructor
Algebraic Geometry
Ph.D. 2023, Cornell University



Sung Gi Park
Veblen Research Instructor
Birational Geometry
Ph.D. 2024, Harvard University



Matt Larson
Associate Research Scholar/
Bourgain Fellow
Combinatorial Algebraic Geometry
Ph.D. 2024, Stanford University
The Bourgain Fellow is a newly created joint position with the IAS. Matt Larson has been selected as the first Bourgain Fellow.



Naomi Sweeting
Postdoctoral Research Fellow
Number Theory
Ph.D. 2024, Harvard University



Tristan Léger
Postdoctoral Research Associate
Mathematical Physics
Ph.D. 2020, Courant Institute, NYU



Sahana Vasudevan
Postdoctoral Research Associate
Metric Geometry
Ph.D. 2022, Massachusetts Institute of Technology



Ana Menezes
Research Scholar
Mathematics, Minimal Surface, Quotient Space, Isometry
Ph.D. 2013, IMPA, Rio de Janeiro/RJ Brazil



Joshua Wang
Veblen Research Instructor
Low-dimensional topology
Ph.D. 2023, Harvard University



Daniel McGinnis
Postdoctoral Research Fellow
Discrete and Convex Geometry
Ph.D. 2024, Iowa State University



Bogdan Zavyalov
Postdoctoral Research Associate
Number Theory
Ph.D. 2021, Stanford University



Stanley Palasek
Postdoctoral Research Associate
Partial Differential Equations
Ph.D. 2023, University of California, Los Angeles



PROMOTIONS

Ravi Shankar
Assistant Professor
Partial Differential Equations
Ph.D. 2021, University of Washington

Honors and Awards

Faculty and Instructors



Noga Alon

Professor Noga Alon has received the 2024 Wolf Prize in Mathematics "for pioneering contributions to mathematical cryptography, combinatorics, and the theory of computer science." He shares the prize with Adi Shamir of the Weizmann Institute of Science in Israel. The Wolf Prize citation called out Alon's "profound impact on discrete mathematics and related areas. His seminal contributions include the development of ingenious techniques in combinatorics, graph theory and theoretical computer science, and the solution of long-standing problems in these fields as well as in analytical number theory, combinatorial geometry, and information theory."



Bhargav Bhatt

Professor Bhargav Bhatt has been awarded the Infosys Prize 2023 by the Infosys Science Foundation in Bangalore, India, for "Outstanding contributions to arithmetic geometry and commutative algebra."



Maria Chudnovsky

Professor Maria Chudnovsky has been named one of forty 2024 AMS Fellows for "Outstanding contributions to the creation, exposition, advancement, communication, and utilization of mathematics."



Peter Sarnak

Professor Peter Sarnak has been awarded the 2023 Stockholm University Honorary Doctorate along with Jim Albrecht, Ian Brooks, Richard Dyer, Jan Ellenberg, Janet Gornick, Birke Häcker, Susanne Ljung, Janet M. Thornton and Susan Vroman. Sarnak also received the 2024 Shaw Prize in mathematics for his "Development of the arithmetic theory of thin groups and the affine sieve, by bringing together number theory, analysis, combinatorics, dynamics, geometry and spectral theory."



Ian Zemke

Assistant Professor Ian Zemke is one of five Princeton faculty among 126 early career scholars named Sloan Research Fellows for 2024. The Sloan Research Fellowships are awarded annually to early-career researchers whose creativity, innovation, and research accomplishments make them stand out as the next generation of leaders.

Faculty Memorial

Joseph Kohn 1932-2023

Mathematician Joseph Kohn, 'a giant' in several complex variables and generous mentor to young scholars, dies at 91

By Liz Fuller-Wright, Office of Communications



Joseph John Kohn, professor of mathematics, emeritus, a 1956 Ph.D. alumnus and a leader in the field of several complex variables, died on September 13, 2023. He was 91. Born in Prague in May 1932, Kohn emigrated to Ecuador in 1939 before moving to New York City in 1945. After graduating from Brooklyn Technical High School and the Massachusetts Institute of Technology, Kohn came to Princeton in 1954 for graduate school, then joined Princeton's faculty as an instructor for one year. He was a professor at Brandeis University for nearly a decade, then returned to Princeton as a full professor in 1968. He taught at Princeton for 40 years, with a few years away as visiting faculty around the globe. He held the Henry Burchard Fine research chair from 2002 to 2003, and he transferred to emeritus status in 2008.

"Joe was among the most friendly, popular and influential mathematicians of his generation," said John D'Angelo, a 1976 Ph.D. graduate and an emeritus math professor at the University of Illinois Urbana-Champaign. "His mathematical legacy is enormous. I talked with Joe many times in the last six months. He remained engaged with mathematics until the end."

Charles Fefferman, Princeton's Herbert E. Jones, Jr. '43 University Professor of Mathematics, worked with Kohn for decades, including collaborating on several papers.

"Joe was very influential and original," Fefferman said.

"He was very focused on a very, very fundamental problem in mathematics. He and his grad students — whom he mentored and nurtured very well — made great progress. The ideas that they came up with were used not only on that problem and related problems, but also on seemingly completely unrelated subjects."

Kohn also spoke many languages fluently, which served him well at the many institutions and conferences he visited throughout his career. He was a visiting professor at Harvard University, the University of Mexico, the University of Buenos Aires, the University of Florence, the Institut des Hautes Études Scientifiques in Paris, and the Charles University in Prague. He was also a visiting scholar at the Institute for Advanced Study four times over his career, as a postdoctoral researcher in 1957-58 and 1961-62, then during his 1976-77 and 1988-89 sabbatical years.

In addition to his accomplishments in mathematics, Kohn was a standout department chair, first at Brandeis (1963 to 1966) and then during several terms at Princeton, where he advocated most effectively for bringing in great mathematicians and receiving increased funding for the department, as well as being an advisor to colleagues and students alike. Kohn led the math department from 1973 to 1976 and from 1993 to 1996, plus he served as acting chair in spring 2002.

"He was an extremely effective chairman," said Fefferman. "Most of the senior faculty take one turn as chair, but it's rare to do more than one. I think people recognized that Joe had a very great talent for this."

It's fair to say that Princeton has the best math program in the country. Not 'one of the best,' the best. Joe brought in very, very strong people. This sounds self-serving — he brought me in — but aside from me, he did magnificent hiring. He brought in Bill Thurston, who was one of the great mathematicians of the century. He also played a role in retaining hires. He was just very good in all aspects of that."

Ngaiming Mok, who is now the Edmund and Peggy Tse Professor in Mathematics at the University of Hong Kong, was on the Princeton faculty with Kohn from 1980 to 1985.

"Besides being inspired by his tremendous leadership in the field of several complex variables, I have much benefited from Joe Kohn's openness and friendliness to junior researchers of different cultural backgrounds. This made me feel much more at



home during my years in Princeton," he said. "We have lost an elder statesman of our field and a dear friend."

Kohn's groundbreaking work dominated his field for more than half a century. He mentored 16 Ph.D. students, plus postdoctoral scholars and junior faculty members. Many recalled what a significant role he played in their lives and careers.

"He was a truly great mathematician whose contributions drastically changed the landscape of the field," said Yum-Tong Siu, a 1966 Ph.D. graduate who is now the William Elwood Byerly Professor of Mathematics at Harvard University. "In the last five decades, his work has been playing such an indispensable role in the research of a whole generation of mathematicians in his field. To younger researchers, he was most inspiring, supportive and generous. He was always the person to turn to for advice mathematically, professionally and personally. We will all sorely miss him."

"Joe Kohn was a giant in the field of analysis of several complex variables," said Andreea Nicoara, a 2002 Ph.D. student of Kohn's who is now the Accenture Associate Professor in Mathematics at the University of Dublin. "For the Princeton math department, he was a very important figure not just professionally but socially. Joe had a very sharp wit and warm personality. He always attended tea, so even graduate students working in different fields of math got to know him. He and his wife Anna Rosa entertained a lot and were very caring whenever someone needed help. My grandfather was killed while I was doing my Ph.D. at Princeton with Joe, and he and Anna Rosa helped me get through that difficult time."

She continued: "One day in my third year, I showed up at my weekly meeting with Joe and told him that I couldn't get anything done because I had sprained some fingers on my writing hand. Joe's eyes twinkled, and he said, 'You sprained your hand, not your brain, right?' I then discovered that I didn't need paper, so I did much of the work on my thesis walking along the canal. Joe worked in this way as well; he would walk around slowly for a while and then come back and scribble a few things down. Although counterintuitive, it is a better way of doing mathematics because one sees the big picture this way and does not get bogged down in details."

Gerald Folland, a 1976 Ph.D. graduate, the author of several math textbooks, and an emeritus professor at the University of Washington, said, "I owe Joe Kohn a lot. I was his first Ph.D. student at Princeton, and the research problem he proposed was a perfect fit for me. Then he took me on as a collaborator to write up his 1970-71 lectures and turn them into a book, which launched me on another important aspect of my career.

"He wasn't afraid to tackle hard mathematical problems, and he had the patience and persistence to keep working on them until he got good results. Joe's mathematical work was almost all in an area that lies at the intersection of complex analysis in several variables and partial differential equations. He was a leading world expert in that specialized area, and some of the techniques he helped develop have much broader applications."

"Meeting Joe was one of the luckiest things in my life," said Charles Epstein, a former Princeton postdoctoral researcher who is now a senior research scientist at the Flatiron Institute's Center for Computational Mathematics and the Thomas A. Scott Professor Emeritus at the University of Pennsylvania.

"When I arrived in Princeton as a postdoc, I knew nothing whatsoever about several complex variables, and was at a loss for what I should do," Epstein said. "Joe sensed that I was floundering and took it upon himself to help me to enjoy my time at Princeton and find a direction for my work. He asked me to run the departmental colloquium and often took me to lunch at the IAS or Faculty Club, during which time we discussed mathematics and a great many other things. As a consequence of Joe's kindness and the presence of a terrific group of postdocs working with Joe in several complex variables, I also ended up working in this field."

Among his many honors, Kohn won a Guggenheim Fellowship in 1976, the Leroy P. Steele Prize of the American Mathematical Society (AMS) in 1979, the Balzano Medal from the Czechoslovak Mathematics and Physics Society in 1990, and the Stefan Bergman Prize for Influential Research from the AMS in 2004. He was elected to the American Academy of Arts and Sciences in 1966 and to the National Academy of Science in 1988.

He served as editor or on the editorial boards of *Advances in Mathematics*, *the Annals of Mathematics*, *the Journal of Differential Geometry*, and *the Transactions of the American Mathematical Society*. He served as a member of the Board of Trustees of the American Mathematical Society and the Board of the Mathematical Sciences of the National Academy of Science.

He was a member of the first delegation of American scientists to visit China, in 1976, and he participated in scientific exchange programs with the USSR (1965) and Czechoslovakia (1967 and 1977). When the University of Bologna celebrated its 900th anniversary, they awarded Kohn an honorary doctorate, calling him "one of the most eminent living mathematicians."

Kohn is survived by his wife, Anna Rosa Di Capua, of

Continued on page 10

Undergraduate Program

Undergraduate Student Updates

Undergraduate Student Profile



Photo by Maya Chande

Maya Chande

Hi, I'm Maya! My mathematical interests lie in the geometry and topology of 4-manifolds. At the moment, I am particularly interested in understanding what PDE can say about the smooth topology of 4-manifolds. For instance, my senior thesis explored invariants derived from the Seiberg-Witten equations and their applications to smooth topology and symplectic geometry. Naturally, my interests and approaches to mathematics are ever evolving; Professor Chang, Professor Gabai, and Professor Szabó have been invaluable guiding lights in this development process. Despite being new to the notion of pursuing math as a career when I arrived at Princeton, the warm community of peers and professors made immersing myself in the field feel completely natural, if not inevitable.

Outside of math, I enjoy learning about art history and reading Russian literature, with a particularly strong love for Dostoevsky. I also bake and write poetry, both of which have helped forge a close friendship with failure.

Recap: Undergraduate Studies

Our academic year began with orientation workshops for incoming first-year students. These workshops have evolved over the past five years to assist students in finding the right starting point for their mathematics coursework, whether it be as a prospective math major or as someone required to take specific mathematics courses for their potential major. Speaking of mathematics majors, we had 87 majors at the end of the 2023-2024 academic year, with a strong showing of 37 new sophomore majors. Our undergraduates continue to excel, with Atharva Pathak '26 and the Princeton team (Benjamin Lemkin '26, Austen Mazonko '24, and Atharva Pathak '26) earning honorable mention in the 84th William Lowell Putnam Mathematical Competition.

A new development in the Math department comes as Princeton moves away from certificate programs and towards official minors – starting with the 2024-2025 academic year, students will be able to declare a minor in mathematics. 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 both a minor in math that supplements students' work in their major field of concentration and a minor in math that will enable students to explore new directions. A student who decides to minor in mathematics might want to learn more math because they have always been curious and enthusiastic math learners and want to build a deeper understanding of the mathematical ideas present throughout their work in their chosen disciplines. We also welcome students from the humanities or social sciences who have enjoyed learning math and would like to continue to explore more advanced ideas in mathematics, whether or not they are directly relevant to their major work. Dr. Mark McConnell will serve as the Minor Program Director.

Graduate Student Profile



Nina Zubrilina

My recent work concerns statistical properties of number theoretic objects, such as point counts of curves or coefficients of modular forms. While research in mathematics inevitably entails periods of deep frustration, I had a

fantastic time doing research at Princeton – getting a chance to do something so exciting for a living is very special! My advisor’s unwavering enthusiasm also played a big part in shaping my time here; our conversations gave me an extra boost of motivation even during the rougher parts of graduate school. This was also one of the biggest factors in my decision to come to Princeton.

A piece of advice I have found helpful during grad school is that maintaining a proper physical and mental state to do creative work is an essential part of a researcher’s job. For me, that meant having a range of hobbies outside of mathematics, keeping a balanced social circle in and out of Fine Hall, and getting out into the “real world” often (personally, I recommend road trips or the many free events on and off campus that Princeton gives us access to). It’s also good to remember that there will be periods when life will have to take priority over research – and that’s okay. For many of my friends, grad school has been a sort of transitional period from the overloaded undergraduate schedule into a more balanced and simultaneously more focused lifestyle, and it’s worth spending some time figuring it all out.

After finishing my degree, I will move to Boston for a postdoc position to continue working with some collaborators whom I met during talks and conferences I attended during grad school. Princeton will be missed!

A Message from the Director of Graduate Studies



Chenyang Xu

This is my second year as Director of Graduate Studies (DGS). Our team consists of the excellent co-DGS Lue Pan and the Graduate Program Administrator Jill LeClair (who held the job back when I was a graduate student at Princeton in 2004). Our

biweekly meetings are platforms to discuss emerging matters; moreover, Lue and I frequently interact with diverse student groups to ensure that all aspects remain on course. The assistance of the graduate student committee, with representatives from each academic level, is also invaluable. Notably, this committee plays an instrumental role in coordinating the Open House—a two-day event aimed at acquainting prospective graduate students with the multiple facets of our department.

In this academic cycle, we are excited to welcome 15 incoming students from premier institutions across the globe. They were selected through a process of three steps: a committee of professors conducts the initial two rounds of evaluation—this year comprising eight members—while the final list is assembled during a full faculty meeting.

Finally, on behalf of our team, I conclude by expressing our heartfelt congratulations to our graduating cohort of graduate students. To each of you, I convey my earnest wishes for a brilliant future, and I hope that the cherished memories forged during your time at Princeton continue to serve as a wellspring of inspiration, much as they have for many of us. Fine Hall will forever stand as your academic home.

Programs

Graduate Honors | Undergraduate Prizes | Alumni News

Ryan Unger Wins Princeton's Top Graduate Student Honor

By Liz Fuller-Wright, Office of Communications



The Jacobus Fellowship was awarded to four graduate students including Ryan Unger, a fifth-year doctoral student in mathematics. The fellowships support the students' final year of study at Princeton and are awarded to one Ph.D. student in each of the four divisions — humanities,

social sciences, natural sciences, and engineering — whose work has exhibited the highest scholarly excellence. All four fellows plan to pursue academic careers.

2024 Undergraduate Mathematics Prizes

The George B. Covington Prize in Mathematics
Zander Hill '24 and Steven Wang '24

The Middleton Miller '29 Prize
Maya Chande '24 and Matthew Kendall '24

The Peter A. Greenberg '77 Prize
Icey Ai '25 and Jack Gallahan '25

The Andrew H. Brown Prize
Stephen Bartell '25 and Michael Cheng '25

The Class of 1861 Prize
Atharva Pathak '26

The Sigma Xi Book Award for Outstanding Research
**Lenca Cuturela '24, Cutter Dawes '24
and Ethan Hall '24**

Inducted into Sigma Xi

**Sara I. Ansari '24
Dimitar Chakarov '24
Maya Chande '24
Lenca Cuturela '24
Cutter Dawes '24
Ethan Hall '24
Sunay Joshi '24
Matthew Kendall '24
Samuel Li '24
Austen Mazenko '24,
Adrian Thananopavarn '24,
Steven Wang '24
Reuel Williams '24
Nancy Xu '24**

Alumni News



Photo by Yifei Dong

Jacob Tsimerman '11 Ph.D. graduate, has been awarded the International Ostrowski Prize in Higher Mathematics 2023 in recognition of his work at the interface of transcendence theory, analytic number

theory, and arithmetic geometry including recent breakthroughs on the André-Oort and Griffiths conjectures.



Photo courtesy of Columbia university

Abigail Hickok '18 is one of the two recipients to receive the Annual Association for Women in Mathematics Dissertation Prize 2024. The AWM was founded in 1971 and has grown into the leading national society for

women in the mathematical sciences.

New alumni members of the National

Academy of Sciences

Aaron Naber, *09

Duong Phong '73, *77

Steven Srogatz, *80

Kohn Memorial continued from page 7

Quito, Ecuador; their children, Eduardo, Emma, and Alicia; daughter-in-law Lisa Stevenson; and grandchildren Benjamin and Milo. Donations in memory of Joseph J. Kohn can be made to HIAS, the National Museum of Mathematics, and the Jewish Center of Princeton.

Recent Ph.D.'s

NAME	ADVISER	THESIS TITLE	ORIGINAL PLACEMENT/POSITION
Fernando Figueroa Zamora	Kollár	Global and Local Fundamental Groups in Algebraic Geometry	Northwestern University/Boas Assistant Professor
Otte Heinävaara	Naor	Tracial joint spectral measures	Caltech/Scott Russell Johnson Post-doctoral Scholar Teaching Fellow
Thomas Massoni	Pardon/Ozsváth	Symplectic and contact aspects of foliations and Anosov flows in dimension three	MIT/C.L.E. Moore Instructor (AY2024-25) and Stanford University/Stanford Science Fellow (as of Fall 2025)
Lu Qi	Xu	Space of filtrations and singularities	Johns Hopkins University/J. J. Sylvester Assistant Professor
Marco Antonio Sangiovanni Vicentelli	Skinner	Crafting Euler Systems: Beyond the Motivic Mold	Columbia University/Ritt Assistant Professor
Érico Silva	Codá Marques	Geometric variations of an Allen-Cahn type energy	George School, Newtown, PA/ Faculty in Mathematics
Lorenzo Sarnataro	Codá Marques	Two regularity results in the theory of minimal hypersurfaces	University of Toronto/Brauer Post-doctoral Fellow
Anna Skorobogatova	De Lellis	Interior regularity for area-minimizing currents	SLMath/McDuff Postdoctoral Fellow (AY2024-25) and ETH Zurich/ITS Junior Fellow (as of Fall 2025)
Ryan Unger	Dafermos	The extremal collapse threshold and the third law of black hole thermodynamics	Stanford University/NSF Postdoctoral Fellow (AY2025-25) and UC Berkeley/Miller Fellow (as of Fall 2025)
Nina Zubrilina	Sarnak	Convergence and Correlations of Coefficients of Cusp Forms	MIT/NSF Postdoctoral Fellow (AY2024-25) and Harvard/Benjamin Peirce Fellow (as of Fall 2025)

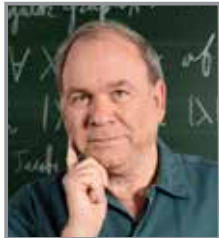
Events

2023-2024



Minerva Lectures

The department hosted the Minerva Lectures series in the spring of 2024. **Benson Farb**, Professor at the University of Chicago, delivered talks on "Mapping class groups of K3 surfaces from a Thurstonian viewpoint." In 1994, Farb received his Ph.D. from Princeton under the direction of Bill Thurston. Farb was elected to The American Academy of Arts and Sciences (2021) and jointly won the 2024 Leroy P. Steele Prize for Mathematical Exposition with Dan Margalit for their Princeton Mathematical Series book *A Primer on Mapping Class Groups*.



Minerva Distinguished Visitor

During the 2023-24 academic year, the department had the privilege of hosting four Minerva Distinguished visitors — **Tarek Elgindi**, Duke University; **Alex Lubotzky**, Weizmann Institute; **Felix Otto**, Max-Planck Institute for Mathematics in the Sciences, Leipzig; and **Pierre Raphael**, University of Cambridge. This position allows leading mathematicians to spend several months in the department interacting with our faculty and students. While here, the Minerva Distinguished Visitors provide talks in their related fields.



Women⁺ and Mathematics

The conference, "Symmetry and Arithmetic," took place at Princeton University and the Institute for Advanced Study on May 19-24, 2024. The department hosted Women⁺ and

Mathematics Princeton Day on May 22 at Fine Hall. The event showcased a comprehensive day of insightful lectures and an interactive panel discussion, "A Day in the Life." Participants enjoyed the popular walking tour filled with historical sites and captivating trivia, followed by dinner and the charm of downtown Princeton.



Photo by Maria O'Leary, IAS

SPEAKERS:

Linda Chen, Swarthmore
Maria Chudnovsky, Princeton
Sasha Fradkin,
Main Line Classical Academy
Margaret Holen,
Princeton | Relational AI |
Square | Goldman Sachs

Casey Kelleher, Princeton
Will Sawin, Princeton
Rita Teixeira da Costa, Princeton
Mingjia Zhang, Princeton

ORGANIZERS:

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



Department of Mathematics Spring Recital

April 19, 2024

Photo by Jill LeClair



Missing from the photo are M. Alper Gunes and Clancy Rowley

It was a captivating Friday evening of musical excellence as our talented students, faculty, and guests showcased their skills and passion in Taplin Auditorium. We extend our gratitude to Jill LeClair, Graduate Administrator, for the exceptional planning and organizing of the performance. The program included classical and folk songs, performed by undergraduates Jack Gallahan, Matthew Kendall, Kaivalya Kulkarni, Owen Yang; graduate students Anthony Coniglio, M. Alper Gunes, Noah Kravitz, Andy Zhang; Senior Lecturer Mark McConnell with guest Clancy Rowley; Professor Peter Ozsváth, and Eric Bahnson '23.

Group and Number Theory: Interactions

A Conference in Honor of Pham Huu Tiep



Photo by Will Crow

The conference was in honor of the 60th birthday of Pham Huu Tiep, professor at Rutgers University. It took place on October 26-30, 2023, at James S. McDonnell Hall, and was co-sponsored by our department, the University of Denver, and Rutgers University. The organizers were Bob Guralnick, USC; Nicholas Katz, Princeton; Gabriel Navarro, U. de Valencia; and Mandi A. Schaeffer Fry, U. Denver.

Noetherian Ring Lecture Series

This past year was the inaugural year of the Noetherian Ring's mentoring program, which pairs undergraduate women and nonbinary math majors with graduate student mentors. Additionally, the Noetherian Ring has continued the Noetherian Ring lecture series, which features women and nonbinary faculty at Princeton

and the IAS presenting their research areas in an accessible way to undergraduate and graduate students. Photographed below is a Noetherian Ring Teatime from Fall 2023 and a prospective math major panel for interested female and nonbinary undergraduates from Spring 2024.



Photos by Katy Woo

Monodromy and Its Applications: A Conference in Honor of Nicholas Katz



The conference was held at Princeton University, December 7-9, 2023, on the occasion of Nicholas Katz' 80th birthday.

The conference was well attended, with around 120 participants. These included many of Katz' students, postdocs, coauthors, colleagues, and friends. The significant attendance is a testament to the far-reaching influence and magnitude of Katz' work.

The talks of the conference reflected Katz' general topic of monodromy. Monodromy occurs when a mathematical object varies smoothly over a space, appearing identical at a point and each nearby point, but traveling around a loop in the space causes the object to twist around. Monodromy occurs throughout mathematics and specifically can be seen in the Möbius strip: each small piece is an ordinary piece of paper but traveling around the circle causes the paper to flip around to the opposite side. The conference provided a historical perspective, recounted current results, and look forward to future developments in monodromy.

The main theme of the conference was the key role of monodromy in all its incarnations: classical and ℓ -adic, local and global, arithmetic and geometric, applications of it in number theory and algebraic geometry, and its connections to group theory and representation theory. In recent years there have been a number of exciting developments in this area. These include the complete classification of the finite (almost quasi) simple groups that occur as monodromy groups of hypergeometric sheaves by Katz, Rojas-León

and Tiep, the proof of many cases of the Putman-Wieland conjecture by Landesmann and Litt, the calculation of Tannakian monodromy groups in new settings by many mathematicians and their applications to generalizations of Shafarevich's conjecture by Lawrence and Sawin, the proof of a relative analogue of Grothendieck's period conjecture for a family of varieties by Bakker and Tsimerman, and the proof of the unbounded denominators conjecture by Calegari, Dimitrov, and Tang. The conference emphasized these developments, with many leading speakers in these areas.

Speakers:

- Ana Caraiani, U. Bonn
- Hélène Esnault, FU Berlin
- Ofer Gabber, IHES
- Robert Guralnick, University of Southern California
- Mark Kisin, Harvard
- Emmanuel Kowalski, ETH Zürich
- Aaron Landesman, MIT
- Michael Larsen, Indiana Univ. Bloomington
- Gérard Laumon, Paris-Sud
- Wanlin Li, Washington University in St. Louis
- Lillian Pierce, Duke
- Will Sawin, Columbia
- Mark Shusterman, Weizmann Institute
- Yunqing Tang, Berkeley
- Jacob Tsimerman, Toronto

Organizers:

- Lillian Pierce, Duke
- Peter Sarnak, Princeton
- Will Sawin, Columbia
- Pham Huu Tiep, Rutgers

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math.princeton.edu

Visions in Arithmetic & Beyond

A Conference Celebrating Peter Sarnak's Work and Impact



Photos by Maria O'Leary, IAS

Princeton University and the Institute for Advanced Study jointly hosted the conference from June 3-7, 2024, on the occasion of Peter Sarnak's 70th birthday. The conference commenced with the first two days hosted at the IAS, followed by the subsequent three days at Princeton University. The talks were well received with approximately 200 attendees. The high attendance was a testament to the engaging and valuable content offered.

The main theme was to celebrate Peter Sarnak's profound influence on, and deep contributions to, many areas of mathematics related to number theory, from prime geodesics to thin groups, dynamics to zeta and L -functions, quadratic forms to questions of rigidity, and from random matrices to arithmetic statistics.

The conference featured 18 talks by leaders in their fields, as well as a panel on mentoring. The Princeton conference videos are available to watch on www.youtube.com/@princetonmathematics.

Speakers:

Manjul Bhargava,
Princeton University
Frank Calegari,
University of Chicago
Simion Filip,
University of Chicago
Larry Guth, MIT
Elon Lindenstrauss,
Hebrew University
Michael Magee,
Durham University/IAS
Melanie Matchett Wood,
Harvard University
James Maynard,
University of Oxford
Curtis McMullen,
Harvard University
Paul Nelson,
Aarhus University

Sarah Peluse,
University of Michigan
Will Sawin,
Princeton University
Daniel Spielman,
Yale University
Terence Tao, UCLA
Jacob Tsimerman,
University of Toronto
Maryna Viazovska,
École Polytechnique
Fédérale de Lausanne
Horng-Tzer Yau,
Harvard University
Tamar Ziegler,
Hebrew University

Organizers:

Alex Gamburd, The Graduate Center, CUNY
Nick Katz, Princeton University
Hee Oh, Yale University
Kannan Soundararajan, Stanford University
Akshay Venkatesh, Institute for Advanced Study

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 2024:

Felix Otto, Max Planck Institute for Mathematics

Spring Semester 2025:

Tomasz Mrowka,
Massachusetts Institute of Technology
Gigliola Staffilani,
Massachusetts Institute of Technology

Minerva Lecture Series

Fall 2024

Alessio Figalli, ETH Zürich

Women+ and Mathematics

— Princeton Day

Fine Hall 314 | 10:00 AM – 5:30PM
May 21, 2025



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Princeton, NJ 08542



Alumni Open House
Friday, May 23, 2025 | 2:00PM
Fine Hall | 3rd Floor Common Room