Abel Prize for John Nash *50

John Nash *50 received the 2015 Abel Prize from the Norwegian Academy of Science and Letters for his work on partial differential equations. Nash shares the $800,000 prize with Louis Nirenberg, a professor emeritus at NYU's Courant Institute of Mathematical Sciences. The prize recognized Nash and Nirenberg for "striking and seminal contributions to the theory of nonlinear partial differential equations and its applications to geometric analysis." Nash's name is attached to a range of influential work in mathematics, including the Nash-Moser inverse function theorem, the Nash-De Giorgi theorem (which stemmed from a problem Nash undertook at the suggestion of Nirenberg), and the Nash embedding theorems, which the academy described as "among the most original results in geometric analysis of the twentieth century." According to David Gabai, the Nash embedding/immersion theorems, which required unusual insight as well as tremendous technical expertise, played an important role in the development of young mathematicians who came in contact with Nash at Princeton in the 1970s.

Fields Medal for Manjul Bhargava *01

Manjul Bhargava is awarded a Fields Medal for developing powerful new methods in the geometry of numbers, which he applied to count rings of small rank and to bound the average rank of elliptic curves.

from the award citation

Manjul Bhargava *01, the Brandon Fradd, Class of 1983, Professor of Mathematics, was awarded the 2014 Fields Medal on August 13, at the opening ceremony of the 2014 International Congress of Mathematicians in Seoul, Republic of Korea by South Korean President Park Geun-hye.

For 2014, there were four Fields Medalists (Artur Avila of the CNRS in Paris, Martin Hairer of the University of Warwick in the UK, and former Princeton professor Maryam Mirzakhani of Stanford University). The prize comes with a monetary award of Canadian $15,000 as well.

Bhargava's Ph.D. thesis (written under the direction of Andrew Wiles, the James S. McDonnell Distinguished University Professor of Mathematics, Emeritus), provided a reformulation of Gauss's law for the composition of two binary quadratic forms. He showed that the orbits of the group SL(2,Z)3 on the tensor product of three copies of the standard integral

From the Chair

This has been quite a year for the Mathematics Department; however, space allows for mentioning but a few of the highlights. To start with, we are overjoyed to have Maria Chudnovsky, Fernando Marques and Assaf Naor as new members of the senior faculty. Their presence has already made a major impact on the Department.

Manjul Bhargava *01 won the Fields medal at last summer's International Congress of Mathematicians in Seoul, Korea. Manjul is not only an extraordinary mathematician but also an unusually gifted teacher and tabla player.

John Nash *50 and Louis Nirenberg from NYU are this year's Able Prize winners. While John is famous for winning the 1994 Nobel prize in Economics for his Ph. D. thesis work on non-cooperative games, this is the first major recognition for his extraordinary work on isometric embeddings and partial differential equations which most mathematicians consider incomparably deeper work. With Yasha Sinai winning the Abel prize in 2014, this marks the first time the Abel prize has gone to mathematicians at the same institution in consecutive years.

Last summer saw the passing of two long time professors, Harold Kuhn 50* and Ed Nelson. Harold and Ed were original and influential mathematicians who respectively changed the face of mathematical economics and constructive quantum field theory. A special day was held on April 22, 2015 to commemorate Ed's work.

Our finishing graduate students wrote marvelous theses and obtained excellent first positions. Of the twenty Sloan Foundation fellowships in mathematics awarded this year, eight went to former Princeton graduate students; Richard Bamler, Boris Bukh, Vivek Shende, Andrew Snowden, Jacob Tsimerman, Melanie Wood, and Hau-tieng Wu from Math and Lin Lin from PACM. In addition, assistant professors Vlad Vicol and Tasho Kaletha were also winners.

We have many excellent teachers among

Fields Medal for Manjul Bhargava (continued)

representation correspond to quadratic rings (i.e., rings of rank 2 over Z) together with three ideal classes whose product is trivial. This recovers Gauss's composition law in an original and computationally effective manner. He then studied orbits in more complicated integral representations, which correspond to cubic, quartic, and quintic rings, and counted the number of rings with bounded discriminant.

Bhargava next turned to the study of representations with a polynomial ring of invariants. The simplest such representation is given by the action of PGL(2,Z) on the space of binary quartic forms. This has two independent invariants, which are related to the moduli of elliptic curves. Together with his graduate student, Arul Shankar, Bhargava used delicate estimates on the number of integral orbits of bounded height to bound the average rank of elliptic curves. Generalizing these methods to curves of higher genus, he recently showed that most hyperelliptic curves of genus at least two have no rational points.

Bhargava's work is based both on a deep understanding of the representations of arithmetic groups and a unique blend of algebraic and analytic expertise.

Bhargava joined the Mathematics Department as a full professor in 2003. In addition to the Fields Medal, he has received numerous other awards including the 2012 Infosys Prize, the 2011 Fermat Prize (presented by the Toulouse Mathematics Institute in France) and the Packard Foundation Fellowship in Science and Engineering in 2004. He was elected to the U.S. National Academy of Sciences in 2013.

Bhargava is an outstanding teacher on both the graduate and undergraduate levels. In recent years, he developed a very popular freshman seminar called "The Mathematics of Magic Tricks and Games," which had the maximal enrollment of 15 students in Spring 2013 and Spring 2015. He also taught "The Magic of Numbers" in the Spring 2007 and Spring 2010, an undergraduate course he developed that included guest lecturers, card games, and drumming to capture the attention of the class whose enrollment neared 160 students.

As an undergraduate at Harvard, Bhargava was exposed to magic from his adviser,

Persi Diaconis, whose research incorporates decks of cards and coin-flipping with other random problems. Bhargava thought they would be a good way to introduce students to a field considered dry and daunting to many. "The Mathematics of Magic Tricks and Games" was designed to show the artistic and creative side of mathematics, which Bhargava asserted is how mathematicians approach their research. He wanted to offer this seminar to freshmen to capture their enthusiasm early in their college careers while introducing them to the 'correct' and 'fun' side of mathematics. For this initiative, Bhargava was awarded several grants from the University, including the 250th Anniversary Fund for Innovation in Undergraduate Education and a grant from the University's Council on Science and Technology.

Students appreciated his enthusiasm and outstanding commitment to his classes. His availability to the students and dedication to providing interesting topics and visiting lecturers was unsurpassed in the Department.

Sharing his love of mathematics extends beyond the university. He recently returned from a tour of India where he traveled to a large number of high schools to discuss the beauty of mathematics with students. He is also head of a committee devoted to bringing scientists from all over the world to visit schools throughout India.

Bhargava was born in Ontario, Canada but raised in New York on Long Island with frequent trips to Jaipur, India, to visit family. His interests include Sanskrit poetry and Tabla drumming. Considered a tabla expert, he has given numerous free tabla performances at student cultural programs, international fairs, and charity benefits on both the Harvard and Princeton campuses.

Amazing. Everyone was engaged and it was always so much fun. I don't know how this course could be improved. It was the best experience ever, and even swayed me to consider being a math major! I don't really know how Professor Bhargava does it, but he's able to explain with incredible clarity very complicated ideas and make them extremely interesting. He seriously deserves a medal or some honorary award for the work he's done with the class.

Excerpt from a student evaluation of a class taught by Manjul Bhargava

Department Chair's letter (continued)

our faculty and students. Peter Sarnak won the University's Phi Beta Kappa teaching award and grad student Thomas Beck won a teaching award from the Graduate School. Departmental teaching awards went to instructors Jeffrey Case and Mihai Fulger and graduate students Nathan Dowlin and Thomas Beck.

Departmental staff play the crucial behind the scenes role that enables us to focus on our research, teaching and studies. Eszter Rudy joined the Department as Grants and Business Manager, replacing Alberta Molnar who got promoted to a managerial position in the Sponsored Research office, and is off to a great start.

Our Department Manager Kathy Applegate received the Presidential Achievement Award. Kathy has done tremendous work for the Department and so we are delighted that she has been recognized at the highest university level.

Coming full circle, Scott Kenney has announced his pending retirement. To many of us Scott was the embodiment of the Math Department. During his 25 years as Department Manager, chairs came and went, but from day visitors to long-time faculty he was there as a constant, welcoming and approachable soul always ready to tackle problems from the complex to the mundane.

While members of our faculty, students and staff have received high profile recognitions for their research, teaching and service, their awards reflect but a small fraction of the tremendous productivity, energy, and enthusiasm that permeates Fine Hall.

Finally, it is my pleasure to thank Bob and Luisa Fernholz, Wei-Tong Shu and the Class of 1971 Fund for their very generous and ongoing support of the activities of our Department.

Thank you for reading this newsletter and reconnecting with the Department. I'd love to hear your thoughts and views.

David Gabai *77, *80, Chair

gabai@math.princeton.edu
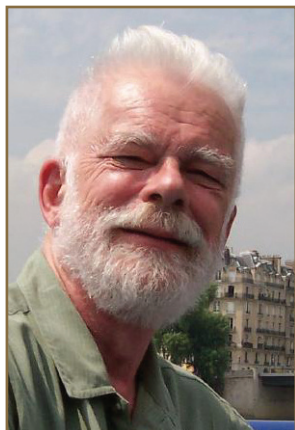
Edward Nelson

Professor Emeritus Edward Nelson, 82 died of complications from lymphoma on September 10, 2014 in Princeton, where he lived with his wife, Sarah Jones Nelson.

Nelson received his Ph.D. from the University of Chicago in 1955. He was appointed Assistant Professor at Princeton University in 1959 and was promoted to the rank of associate professor in 1962 and full professor in 1964. He became Professor Emeritus in 2013 upon his retirement. Nelson's research inspired further research and advancement in the fields of analysis, probability, and mathematical logic.

Born in Decatur, Georgia, Nelson lived in Italy as a child, under the dictatorship of Benito Mussolini. He moved to New York City before the start of World War II but later returned to Italy to attend high school. As a graduate student at the University of Chicago, he studied under Irving Segal and received his M.S. in mathematics in 1953. He came to Princeton after an appointment as an NSF Postdoctoral Fellow from 1956-1959 at the Institute for Advanced Study.

Although accomplished in many areas of mathematics, Nelson was perhaps especially well known for his successful application of probability to quantum field theory. He received the Steel Prize for Seminal Contribution to Research in 1995 from the American Mathematical Society (AMS) in recognition of this work. The AMS also recognized two of Nelson's papers (respectively published in 1966 and 1973) that "showed for the first time how to use the powerful tools of probability theory to attack the hard analytic questions of constructive quantum field theory," as stated on the award citation. The latter paper "fired one of the first shots in what became known as the Euclidean revolution," according to the AMS. Among his other honors, Nelson was elected to the American Academy of Arts and Sciences in 1975, the National Academy of Sciences in 1997, and the American Association for the Advancement of Science in 2003.

Nelson enjoyed teaching and taught very successfully on both the graduate and undergraduate levels. (He had looked forward to teaching a junior seminar called, "Radically Elementary Mathematics," in the Fall semester, 2014.)

In addition to his wife, Nelson is survived by a son and daughter, three grandchildren, and two great-grandchildren. He was predeceased by his first wife, Nancy Wong Nelson.

Harold W. Kuhn *50

Professor Emeritus of Mathematical Economics Harold W. Kuhn *50 died peacefully in his sleep on July 2, 2014 in New York City where he lived since 2005. He would have been 89 years old on July 29, 2014.

Kuhn was appointed at Princeton jointly in the Mathematics Department and the Economics Department as an Associate Professor of Mathematical Economics in 1959 and was promoted to the rank of Professor in 1963. He became a Professor of Mathematical Economics upon his retirement in 1995. Kuhn was considered a world-leader in the fields of linear and nonlinear programming, game theory, combinatorial problems, and the application of mathematical techniques.

Kuhn was born in Santa Monica, CA in 1925. He served in the United States Army from 1944 to 1946. He received his B.S. from CalTech in 1947, and his M.A. (1948) and Ph.D. (1950) from Princeton. He joined the faculty at Bryn Mawr between 1952 and 1959.

Kuhn served as President for the Society for Industrial and Applied Mathematics (SIAM) for 1953-54, Executive Secretary of the Division of Mathematics for the National Research Council from 1957-60, Member of the National Research Council from 1961-64, and Senior Consultant and Board Member for MATHEMATICA, Inc., from 1961-83. He also served as a co-Director of the NATO International Summer School in Varenna, Italy for 1967 and 1970 and as co-Director of the NATO Advanced Study Institute in Capri, Italy, for 1987.

Among his many honors were a Guggenheim Fellowship for 1982-83 and Honorary Membership in the Hungarian Operations Research Society (1992). He was a Fellow of the Econometric Society (1961) and Fellow of the American Academy of Arts and Sciences (1992). He shared the John von Neumann Theory Prize with David Gale and A.W. Tucker in 1980.

He edited the first two volumes of "Contributions to the Theory of Games" with the late Professor Albert W. Tucker of the Mathematics Department. He was a member of a prominent group of economists who introduced sophisticated mathematical tools into economic analysis and changed the field forever. He is particularly renowned for the "Kuhn-Tucker Theorem," (in collaboration with Albert W. Tucker), which is considered a major contribution to the development of nonlinear programming. He also made many important contributions to general equilibrium theory and the treatment of information in extensive form games.

Kuhn was a gifted teacher on both the undergraduate and graduate levels. During his tenure at Princeton, he also served diligently on a number of University committees that had a profound impact on the University community.

Kuhn is survived by his wife, Estelle (nee Henken), whom he married while a graduate student at Princeton in 1949, three sons, six grandsons, and a granddaughter.
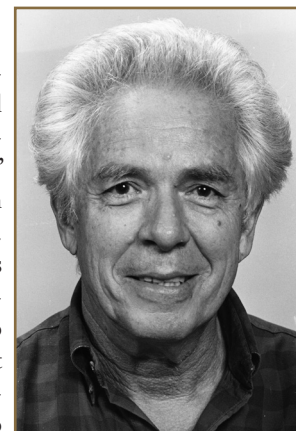
Maria Chudnovsky *03

returned to Princeton as a full professor jointly appointed in the Mathematics Department and the Program in Applied and Computational Mathematics on January 1, 2015. She comes from Columbia University, where she was appointed as Liu Family Professor of Industrial Engineering and Operations Research and Professor of Mathematics. Her field of research is in Discrete Mathematics and, specifically, in the areas of graph theory and combinatorial optimization.

Chudnovsky received her Ph.D. in Mathematics from Princeton University in 2003 working with Paul Seymour as her thesis advisor. She received a M.Sc. from Technion Israel Institute of Technology in 1999.

Her awards include the MacArthur Foundation Fellowship in 2013, and the D.R. Fulkerson Prize in 2009, which she shares with collaborators Neil Robertson, Paul Seymour, and Robin Thomas. She was also awarded a five-year Clay Mathematics Institute Research Fellowship in 2003. She was an invited speaker for the Combinatorics Section of the International Congress of Mathematics held in Seoul, South Korea in 2014. She was appointed jointly at Princeton and the Institute for Advanced Study as a Veblen Research Instructor from 2003-2005 and was promoted to assistant professor for 2005-2006.

Assaf Naor

joined our department as a full professor on September 1, 2014. Prior to coming to Princeton, he was appointed Professor of Mathematics at the Courant Institute of Mathematical Studies, New York University. His field of research includes Analysis, Probability, Quantitative geometry, and their applications to combinatorics, mathematical physics, and theoretical computer science. His work on the Lipschitz Extension Problem is an example of his very significant contributions.

Naor received his Ph.D. in Mathematics from the Hebrew University in Jerusalem in 2002, where he also received an M.Sc. in 1998. His awards include Bocher Memorial Prize in 2011, the Salem Prize in 2008, and the European Mathematical Society prize in 2008. He has been a prominent speaker at the University of Chicago (Zygmund-Calderón Lectures in 2011), International Congress of Mathematicians in Hyderabad, the Indian state of Andhra Pradesh (2010), and was the plenary speaker at the annual meeting of the Israel Mathematics Union and the Clay Research Conference, both in 2008. He also served as our Minerva Lecturer in October 2013 and gave a series of talks in our department as part of that special program.

Fernando Codá Marques

joined our department as a full professor on September 1, 2014 after being a professor at IMPA—Associacão Instituto Nacional de Matemática Pura e Aplicada in Rio de Janeiro, Brazil. His field of research is in Geometric Analysis.

Marques received his Ph.D. in Mathematics from Cornell University in 2003 studying with Jose Escobar. He was the recipient of the 2012 Academy of Sciences for the Developing World (TWAS) Prize, cited "for his contributions to the field of differential geometry, particularly for his work on variational problems in conformal geometry and applications of the theory of Ricci flow." He also was awarded the 2012 International Centre for Theoretical Physics' (ICTP) Ramanujan Prize for Young Mathematicians from Developing Countries (It is supported by the Norwegian Academy of Science and Letters through the Abel Fund, with the cooperation of the International Mathematical Union.) Fernando gave a plenary address at the International Congress of Mathematicians in Seoul Korea, in 2014.

Marques is one of the world's young leaders in geometric analysis. He has made several fundamental contributions to a broad range of problems in geometric analysis, including the very recent solution to the long-standing Wilmore conjecture (with André Neves).

NOTICE: STAFF OFFICE CHANGES
LeeAnn Coleman, our Undergraduate Administrator, has moved her office to 315, along the central third floor corridor of Fine Hall. Her office is now next to that of Graduate administrator Jill LeClair, so that students can readily receive the administrative support they need and have a ready, friendly face during difficult times.

Mykhaylo Shkolnikov

Probability theory, its applications to mathematical finance, queueing theory, and statistical physics.

Ph.D. in Mathematics, Stanford University, 2012; Diploma in Mathematics, Ludwig-Maximilians Univeristy in Munich, Germany, 2007; Vordiplom in Mathematics (passed with distinction; minor in computer science), Ludwing Maximans University in Munich, Germany, 2006.

Previous positions: Postdoc Department of Statistics, UC and MSRI, Berkeley.

Shkolnikov will be moving to ORFE next academic year. We wish him well in his new position.
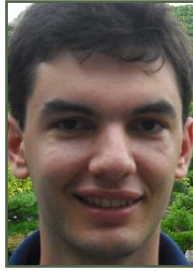
Zsolt Patakfalvi

Algebraic Geometry (with connections to Complex and Arithmetic Geometry and to Commuta- tive Algebra).

Ph.D. in Mathematics, University of Washington, Seattle, 2011; Masters in Mathematics (summa cum laude) Eötvös Lorand University, Budapest, Hungary, 2006; Masters in Computer Science, Technical University of Budapest, Budapest, Hungary, 2004.

Previous positions: Instructor, Princeton University, Department of Mathematics.

Patakfalvi also serves as our junior Director of Graduate Studies.

Fabio Pusateri

Analysis of PDEs: Dispersive and Wave Equations. Fluid Dynamics: Euler Equations and Water Waves. Harmonic Analysis and applications to PDE. Hamiltonian Dynamics and Small Divisors.

Ph.D. in Mathematics, New York University, 2011. Masters in Mathematics , University of "Roma Tre", 2006.

Previous positions: Simons Postdoctoral Fellow, Princeton University, Department of Mathematics.

Co-organizer of the Analysis Seminar and the Analysis of Fluids and related topics Seminar.

Lucas Culler

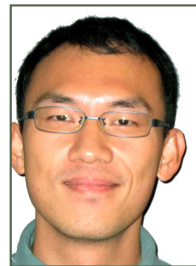Gauge theory, invariants of smooth 4-manifolds, mirror symmetry.

Ph.D. in Mathematics, MIT, 2014; B.S. in Mathematics, University of Chicago, 2009.

Michaela Ignatova

Partial Differential Equations, Mathematical Fluid Dynamics, Harmonic Analysis.

Ph.D. in Mathematics, University of Southern California, 2011; M.Sc. in Mathematics and Mathematical Physics, Sofia Uiversity "St. Kliment Ohridski" in Sofia, Bulgaria, 2006; Maitrise de Mathématiques, Université de Nates in France, 2004; B.Sc. in Mathematics, Sofia University "St. Kliment Ohridski," in Sofia, Bularia, 2004.

Previous positions: Postdoc, Stanford University; Visiting Assistant Professor, University of California, Riverside.

Daniel Ketover

Geometric Analysis, specifically Min-Max techniques and their use in producing embedded minimal surfaces in Riemann 3-manifolds.

Ph.D. in Mathematics, MIT, 2014; A.B. in Mathematics (Magna Cum Laude), Harvard College, 2007.

Chun-Hung Liu

Graph Theory, combinatorics, and algorithms.

Ph.D. in Mathematics, Georgia Institute of Technology, 2014; M.S. in Mathematics, National Taiwan University, 2009; B.S. in Mathematics (with minor in Computer Science and Information Engineering), National Taiwan, 2007.

Jonathan Kommemi

50% Instructor 50% NSF Postdoc General Relativity.

Ph.D. in Applied Mathematics and Theoretical Physics, University of Cambridge 2013; M.A.St. Part III of the Mathematical Tripos, University of Cambridge, 2009; B.A. in Mathematics (with Highest Distinction), University of California, San Diego, 2008.
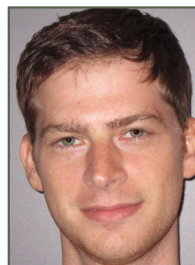
Ana Menezes

Differential Geometry.

Ph.D. in Mathematics, Assciação Instituto Nacional de Mathemática Pura e Aplicada (IMPA) 2013; M.S. in Mathematics, Universidade Federal de Alagoas (UFAL) 2009; B.S. in Mathematics, Universidade Federal de Sergipe (UFS) 2008, all in Brazil.

Manjul Bhargava *01

Foreign Fellow of the Indian National Science Academy

The election, effective from 1 January 2015, cites Bhargava's "spectacular work with his discovery of composition laws of higher degree, originally discovered by CF Gauss in the nineteenth century for quadratic forms. His work in algebraic number theory is profound and extraordinarily original. It has revolutionized the way in which number fields on elliptic curves are counted."

The Padma Bhushan award, one of the highest civilian awards in the Republic of India

Manjul Bhargava was contacted by the President of India to return to India to receive the Padma Bhushan award at Rashtrapati Bhavan (the President's House). The award, confered by the president, is offered for "distinguished service of high order" and this year's recipients include Bill and Melinda Gates as well as the famous Indian actor Amitabh Bachchan.

Emeritus Professor John H. Conway

Doctor Honoris Causa of Alexandru Ioan Cuza University, Iasi, Romania

The award was presented at a ceremony held on June 24, 2014.

The awarding of this degree and attendant conference in Iasi marked the official opening of the Grigore Moisil Institute, a joint initiative of Alexandru Ioan Cuza University of Iasi and the University of Bucharest.

Sergiu Klainerman

Simons Fellow in Mathematics

The Simons Foundation Division for Mathematics and the Physical Sciences offers the Simons Fellows Programs in both Mathematics and Theoretical Physics, providing funds to faculty for up to a semester long research leave from classroom teaching and administrative obligations.

Amit Singer

Moore Investigator in Data-Driven Discovery

The five-year awards, offered by the Gordon and Betty Moore Foundation will enable the recipients to make a profound impact on scientific research by unlocking new types of knowledge and advancing new data science methods across a wide spectrum of disciplines.

Tasho Kaletha and Vlad Vicol

Sloan Fellows in Mathematics

The Sloan Research Fellowships seek to stimulate fundamental research by early-career scientists and scholars of outstanding promise. They are awarded in recognition of distinguished performance and a unique potential to make substantial contributions to their field.

Congratulations to Fields Medal winner Maryam Mirzakhani who was on our faculty from 2004 to 2008.

Junior faculty profile

Vlad Vicol

Ph.D., University of Southern California (2010); M.A., University of Southern California (2007); B.Sc., Jacobs University Bremen, Germany (2005). L.E. Dickson Instructor at the University of Chicago (2010—2012); Assistant Professor of Mathematics, Princeton University, since September 2012.

Vicol hails from the beautiful city of Oradea, in Transylvania, Romania.

His research lies at the intersection of partial differential equations and probability theory, with an emphasis on problems arising in fluid dynamics. His work focuses on the analysis of equations describing incompressible Newtonian fluids, such as the Navier-Stokes and Euler equations. These models account for interactions between a broad range of space and time scales (in a highly nonlinear fashion) and the accuracy needed to fully resolve the underlying phenomena via numerical computations is out of reach for the foreseeable future. Two of the questions that drive Vicol's work are: Do singularities in the fluid equations exist? If they do, what do they teach us about turbulence?

The mathematical tools he uses in his research come from different areas in analysis, such as harmonic analysis, regularity theory (elliptic and parabolic), spectral theory, stochastic analysis, infinite dimensional dynamical systems, convex integration, and integro-differential equations, among others.

Both his graduate-level research and his graduate teaching were recognized with prizes: the 2009 Dennis Ray Estes Graduate Research Prize and the 2009 Theodore Edward Harris Graduate Teaching Prize, both from the University of Southern California. He was also awarded a Center for Applied Mathematical Sciences' Graduate Student Prize by USC in 2010. And, recently, he received a Sloan Research Fellowship in Mathematics for 2015.
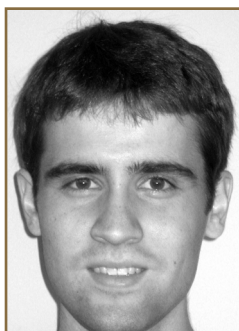
Junior Faculty Teaching

This is the second year of the *Department of Mathematics Junior Faculty Teaching Award*.

Jeffrey Case has been described by his students as helpful and caring, a superb and masterful lecturer who is able to present complex material in a way that is easy to understand. His students range from math majors to non-majors and they have found his classes to be a valuable learning experience while being highly enjoyable at the same time. He has worked as a course head as well and has proven himself to be well-organized and thoughtful, taking his duties quite seriously and serving as a valuable mentor to his teaching colleagues and to novice instructors as well.

Mihai Fulger's students have referred to him as 'a great teacher with a terrific personality' and 'the perfect preceptor.' He has been exceptionally attuned to how his students think and what they find challenging, always able to respond to their questions with both clarity and insight. Students have also described him as clear and methodical while displaying a sense of humor that always kept his classes interesting. Teaching colleagues have found him to be insightful, judicious, and generous as well. He has served well as course head, taking those duties seriously and creating supplemental handouts for an introductory course in linear algebra, which was of great use to both students and instructors alike.

Teaching awards recognize excellence in teaching at the undergraduate level. Selection for both awards was made by a committee of senior faculty members.

Graduate Teaching

This is the third year of the *Department of Mathematics Graduate Teaching Award*.

Nate Dowlin was nominated for this award because of his obvious commitment to teaching and dedication to his students. He is an innovative teacher who brings his love of mathematics to the classroom, introducing new ways to keep his students engaged. His students commented that he stimulated their curiosity and independent thinking through daily puzzles, through explanation that revealed hidden connections, and through lectures that were always both illuminating and engaging. One of his students said, "He opened every class with a math riddle, and I looked forward to it every MWF!"

Thomas Beck's student evaluations were overwhelmingly positive—with 17 out of 19 students attending his calculus class giving him the highest rating of "excellent." His quiet and serious teaching style served as an inspiration to his students. In his student nominations, one student said, "Tom was a great teacher. His teaching was clear and organized, and he always made sure we understood what was going on before moving on to the next concept. He was patient with our questions, and able to explain things in a way that made sense, which I think is very valuable for a math teacher." Another student wrote, "I could not have asked for a better teaching for my first math course at Princeton."

MINERVA PROGRAM - Year 4

Through the generosity of the **Minerva Foundation**, the Mathematics Department hosted another special lecture series during the Fall term.

Barry Mazur *59

This year's Minerva Lecture series was given by Barry Mazur of Harvard University in mid-October 2014. The topics of Professor Mazur's three lectures were: Logic, Elliptic Curves, and Diophantine stability.

Diego Cordoba *98

Our Minerva Distinguished Visitor was Diego Cordoba of the Instituto de Ciencias Matemàticas of Madrid. He spent the Fall semester at Princeton working on ongoing projects with our faculty and gave a series of talks on "interface dynamics for incompressible flows."

Cordoba remained in our department as a 'visiting research scholar' for the spring term.

Videos of the lectures are now available at   **https://www.math.princeton.edu/media/videos**

Summer Undergraduate Research Program: 2014.

Once again, the Math Department was pleased to be able to offer an eight week summer program for undergraduate math majors to conduct on-campus research and/or guided independent study. Over the past three years, the program has provided $4,000 stipends to approximately 10 math majors each year. Although rising juniors and seniors are given preference, rising sophomores are also accepted.

Undergraduate majors are encouraged to apply for this summer research opportunity. Students are asked to choose the research topic that interests them, provided they can find a faculty member who agrees to serve as the supervisor over the summer.

In addition to our own on-campus summer research program, undergraduate majors may apply for financial support to participate in an off-campus NSF-funded Research Experience for Undergraduate Program (known as an REU) at another institution. (REUs generally focus on mathematical areas that are considered somewhat outside of the mainstream with problems that require relatively little specialized knowledge.) It is felt that the experience of participating in an REU as an undergraduate student will provide that student with the opportunity to focus on a single mathematical research problem while the Princeton program introduces students to the idea of independent research while providing the student with a strong foundation of knowledge in a specific area of mathematics, which would be useful for pursuing other research topics in the future.

The following students received support from the Mathematics Department and the Jaywood Lukens '30 Scholarship Fund.

	Student	Faculty mentor	Topic of research
At Princeton	Arka Adhikari '16	Paul Yang	General Relativity and Cosmic Censorship.
	Kubrat Danailov '15	Jon Fickenscher	Properties of Symbolic Dynamical Systems and the S-adic Conjecture.
	Billy Fang '15	Jon Fickenscher	Toward the S-adic Conjecture.
	Jack Jenkins '15	Paul Yang	Summer research on the S-adic Conjecture.
	Monica Marinescu '15	Mihai Fulger	Algebraic Geometry.
	Clayton McDonald '15	Jeffrey Case	Riemannian Geometry and Applications to Topology.
	Alexander Payne '16	Paul Yang	Optimal Transportation and the Isoperimetric Inequality in the Heisenberg Group.
	Paul Rapoport '15	David Gabai	Knot theory and Homological Algebra
At the University of Minnesota	Bumsoo Kim '16	Joseph Gallian	The Cross Number of Zero-sum Free Sequences in Finite Abelian Groups
	Marya Sardarli '15	Greg Musiker, Pavlo Pylavskyy, Vic Reiner, Dennis Stanton,	Quivers of Period 2

Rising juniors and seniors were also invited to apply for funding made available by the NSF to Sucharit Sarkar, Assistant Professor of Mathematics, for a research project in low dimensional topology. Daniel Dore '16 and Yuval Wigderson '16 received $4,000 stipends and were required to be on campus for the months of July and August. They studied two modern (and fairly important) invariants of knots: Khovanov homology and knot Floer homology. Both invariants could be studied combinatorially; the former via a cube of resolutions of a knot diagram and the latter via grid presentations of knots.

Geometry and Topology Conference

The conference was in honor of the 70th birthday of **Martin Bendersky**, professor at Hunter College, CUNY, and in memory of **Sam Gitler *60**, who passed away this year. It took place at Fine Hall, and was co-sponsored by our department and the CUNY Graduate Center. It was organized by Tony Bahri from Rider who is a visiting research scholar here this term.

Martin Bendersky

Sam Gitler,

ANALYSIS, SPECTRA, AND NUMBER THEORY:
A Conference in Honor of Peter Sarnak
By Michael Rubinstein, co-organizer of the conference

The conference was held at Princeton University and the Institute for Advanced Study, December 15 - 19, 2014 on the occasion of Peter Sarnak's 61st birthday.

The conference was well attended, with around 350 participants. These included many of Sarnak's students, postdocs, co-authors, colleagues, and friends. The large turnout is a testament to the far reaching influence and importance of Sarnak's work. While L-functions and automorphic forms have played a central role in Sarnak's research, his broad view of mathematics has allowed him to bring ideas from number theory to bear on other areas, such as in his construction of Ramanujan graphs and also quantum gates. Reciprocally, he has brought insights and techniques from other areas, such as mathematical physics and random matrix theory, to shed light on number theory, for example in his statistical analysis with Rudnick and Katz on distribution of zeros of L-functions. Sarnak's knack for recognizing connections between seemingly disparate areas of mathematics, and for posing essential and fundamental questions that lie at the interface between the difficult and the impossible, has inspired colleagues and students alike and has changed the landscape of mathematics.

The talks of the conference reflected Sarnak's broad impact on mathematics. It focused on analytic number theory, with emphasis on its many relationships with analysis and spectral theory. Highlighted topics included arithmetic quantum chaos, analysis of families of L-functions, arithmetic statistics, and connections with ergodic theory. These areas have seen a flurry of activity in recent years, including: the resolution by Lindenstrauss of Rudnick and Sarnak's quantum unique ergodicity conjecture for arithmetic surfaces; spectacular breakthroughs by Bhargava and his colleagues concerning the statistics of number fields and elliptic curves; detailed models and predictions for the zero and value distribution of L-functions that were inspired via connections with random matrix theory; construction and the analysis of highly efficient expander graphs; the development of additive combinatorics based on the work of Green and Tao. The conference emphasized these developments, with many leading speakers in these areas.

SPEAKERS

Nalini Anantharaman, Orsay	Alex Eskin, Chicago	Elon Lindenstrauss, Hebrew U.
Manjul Bhargava, Princeton	Ben Green, Oxford	Alexander Lubotzky, Hebrew U.
Alice Chang, Princeton	Henryk Iwaniec, Rutgers	Philippe Michel, EPFL
J. Brian Conrey, AIM	Nicholas Katz, Princeton	Werner Muller, Bonn
Bill Duke, UCLA	Jon Keating, Bristol	Jonathan Pila. Oxford
Matthew Emerton, Chicago	Xiaoqing Li, SUNY-Buffalo	Ze'ev Rudnick, Tel Aviv
		Freydoon Shahidi, Purdue

ORGANIZERS

Percy Deift, NYU	Richard Taylor, IAS
Stephen D. Miller, Rutgers	Akshay Venkatesh, Stanford
Michael Rubinstein, Waterloo	Shouwu Zhang, Princeton
Kannan Soundararajan, Stanford	

videos of the lectures are available at:

https://www.youtube.com/user/princetonmathematics

Peter and his wonderful families

Naser Talebi Zadeh

Nasser is in his fourth year of Ph. D. studies. He grew up in Kerman, in the southeast of Iran. He completed his undergraduate degree at Sharif University, and received a Master's of Mathematics from Cambridge University.

I work in analytic number theory. Specifically, I am interested in the topics related to the limit multiplicity theorem and the applications of the Ramanujan conjecture in geometry and graph theory. As an undergraduate at Sharif and later at Cambridge university, I explored different fields of mathematics such as probability theory, differential geometry, topology and analysis. I found the questions in number theory deep and fascinating; one needs to apply techniques and ideas from other branches of mathematics to understand them.

I am very fortunate to have great parents who always encouraged me and gave me interesting books to read. I remember my mother gave me some brainteasers as a child. I realized that I was good at them! Later, in high school, I began training for and participating in math Olympiads, and I won a gold medal in the IMO.

Princeton is a heaven for mathematicians. Before coming to Princeton, I had heard great things about Professor Sarnak and Princeton. Professor Sarnak is a phenomenal advisor and he is always inspiring and full of energy. He introduced me to important problems and different projects from computer science to Iwasawa theory. Sarnak is certainly gifted in guiding students and making graduate school seem easier for his students.

I am applying for postdoctoral positions next year and I plan to pursue a carrier in academia.

I certainly grew up a lot by interacting with the diverse and highly intellectual community of Princeton university. I definitely recommend international students to check out the Davis international center program. There is always something interesting going on on campus. The best years of my life have been spent in Princeton.

Heather Macbeth

Heather is finishing her Ph.D this year. with a thesis on "Kahler-Einstein metrics, Bergman metrics, and higher alpha-invariants" supervised by Gang Tian.

Starting in September 2015 she will be a Moore Instructor at MIT.

Heather is originally from New Zealand where she completed her undergraduate studies obtaining a B.Sc. in Mathematics, with First Class Honors, from the University of Auckland.

She obtained a Master's in Mathematics ("Part III"), with Distinctio,n from Trinity College, University of Cambridge, UK.

Heather's international experience extends to many continents: she spent a semester in Peking at the Beijing International Center for Mathematical Research in 2013, and a semester at Albert-Ludwigs-Universitat Freiburg, Germany.

I fell in love with differential geometry as an undergraduate in New Zealand, when I encountered the oldest and most fundamental classification theorem in differential geometry: the classification of constant-sectional-curvature manifolds according to their universal covers. The things that delighted me about that theorem are still what appeal to me now about my field of research: the satisfaction and solidity of a good uniformization/classification theorem, and the intricate interplay of topology, analysis and algebra.

The graduate admissions open house.

blogs.princeton.edu/mathclub

The Math Club launches new journal

Principia is the new mathematics research journal for undergraduates offered by the Princeton University Mathematics Club to encourage students to learn about new mathematical research. **Principia** aims to provide young mathematicians and all those interested with a resource to exchange mathematical knowledge and ideas. The journal publishes articles and papers on current research at a level accessible to an interested undergraduate. Articles are not limited to research -- a variety of non-research pieces pertaining to mathematics are also published. **Principia** includes expository articles on interesting mathematical properties as well as some light-hearted articles.

All submitted articles will be peer-reviewed before publication. Submission period for 2nd issue is ongoing until May 31.

The Princeton University Mathematics Club is a student organization devoted to students with an interest in math and math-related activities. The club provides advising services, organizes academic and social events and facilitates the development of close connections between all members of the Princeton mathematics community.

PRINCIPIA STAFF

Faculty Advisors

Professor John Conway
Professor Manjul Bhargava

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Andy Loo '16

Business Director: David Zhao '15

Academic Director: Daniel Dore '16

Production Director: Elizabeth Yang '16

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To get an article published or to join the **Principia** team, visit the **Principia** website for more information:

pumj.org/submission

The Princeton Undergraduate Mathematics Club's new journal **Principia** is a truly wonderful initiative! Our undergraduates write so many amazing papers and articles every year, but few of us ever get to read them. **Principia**, by collecting, reviewing, editing, and publishing some of the most outstanding and accessible of these papers (in addition to recruiting other excellent articles from undergraduate students, graduate students, and faculty,) is doing a great service to the mathematical community in making these papers available for all of us to read and enjoy!

The name of the journal was also cleverly thought of by **Prof. Conway**, so that the first syllable of the journal name and the name of our university coincide. I hope and fully expect that the journal will be a great success!

Manjul Bhargava

CONGRATULATIONS

The Middleton Miller '29 Prize

Alexander Daniel Iriza '14
Jane Wang '14

The Andrew H. Brown Prize

Alexander Degener Smith '15

The Peter A. Greenberg '77 Prize

Alan Chang '14
Eric Christopher Chen '14
Kai Zong Khor '14

The Class of 1861 Prize

Bumsoo Kim '16

Isabelle Nogues, a junior math major, received a Mellon Mays Undergraduate Fellowship which aims to increase the representation of minority groups in academia.

Isabelle is the first math major to win the fellowship at Princeton. Her fellowship mentor, Christine Taylor, guides her toward activities and opportunities that strengthen her candidacy for graduate school.

Isabelle is fluent in French and Italian, and plays violin for the university orchestra. She plans to write a junior paper on number theoretic applications to cryptography with Ana Caraiani and a senior thesis on math and music with Manjul Bhargava.

CONGRATULATIONS

The 74th William Lowell Putnam Mathematical Competition

$1000 Award Rank 6–19

Bumsoo Kim
Eric D. Schneider

Honorable Mention

Andre A. Arslan
Mariya Sardarli

The 21st Women and Mathematics Program
by Christine Taylor
Intensive mentoring program for undergraduate, graduate, and postdoctoral women

Each May, about 40-60 women studying mathematics at institutions all over the US gather on the campus of the Institute for Advanced Study in Princeton for an intensive residential mentoring program. The two-week program aims to inspire talented women from undergraduate through doctoral levels to achieve their educational and career goals, as well as to address the isolation and lack of support many women face in mathematics.

Research mathematicians such as Prof. Maria Chudnovsky *03 and Wei Ho *09 are recruited to give lecture series and colloquia that focus on a particular mathematical topic each year.

This year, the **Women and Mathematics Program** participants came to Fine Hall for a full day of talks by faculty and graduate students on Monday, March 18th. Lunch and dinner in the Professors' Lounge were highlights of a busy day where participants enjoyed meeting Princeton graduate students, postdocs, and faculty members. A violin concert by Isabelle Nogues '15 took place at 5 p.m. in the Woolworth Center on campus.

Other "Princeton Day" activities have included visiting Princeton's Plasma Physics Laboratory and panel discussions on a variety of topics of interest.

Over two weeks, women mathematicians from all levels learn, work, and socialize together in a supportive environment. Mathematical bonds are often created between senior mathematicians and graduate students/postdocs. Past participants overwhelmingly report that they feel inspired and encouraged by the women they meet during the program, and that the program is a vital opportunity to reinvigorate their studies and research. Many student participants return to the program in subsequent years as teaching assistants, lecturers, and colloquium speakers.

In the last 20 years or so, around 1000 women mathematicians have visited Princeton as part of the **Women and Mathematics Program** and about 70% have remained in academia. The program alumnae who have benefitted from their experience at the **Women and Mathematics Program** will help us to continue to strengthen the program for future women mathematicians.

Monday, May 18th, in Fine Hall, a full day of talks by faculty and graduate students.

Topic: Algebraic Geometry

Sponsored by:
Institute for Advanced Study
Princeton University Math Department
NSF

Lecture topics:
Combinatorics and Graph Theory, 2013
Random Matrix Theory 2014
Aspects of Algebraic Geometry 2015

Past years' evening Women in Science seminar topics:
Work-Life Balance in a Math Career
Surviving in Graduate School'
Career Paths for Women in Maths
Becoming an Academic Mathematician
Using Language for Success which Offsets Stereotypical Behavior

Math and music: our annual recital

This year's Department Spring Recital was held on April 30 at 5:30 p.m. in Taplin Auditorium. The performers were members of the Fine Hall community. Faculty members: Florian Sprung (bandoneon), Mark McConnell (baritone); Graduate students: Yuchen Liu (classical guitar), Junho Peter Whang (piano), Nikita Lvov (piano), Ryan Peckner *15 (piano), Matthew de Courcy-Ireland (piano); Undergraduate student: Billy Fang '15 (piano). Alumni: Adrian Banner (piano), Alex Kontorovich '02 (clarinet and saxophone). Friends and family were invited to a reception afterward in the Common Room.

Thank you, Jill, for organizing it!

There is so much musical talent in this department, including PACM. We hope to hear from many of you next year! If you are interested in participating in future recitals, contact the organizer, Jill LeClair.

Women in mathematics Program. Photos by Katarzyna Mieczkowska

Scott Kenney

Scott Kenney plans to retire after 27 years with the department.

Scott joined the Math Department as the Assistant Department Manager in December1986 and assumed the position of Department Manager in July of 1987. He remained in that position for 25 years, becoming the Special Projects Manager on a half-time basis in September 2012. Scott joined the University in 1984 and worked in the Statistics Department and in the Registrar's Office before coming to the Math Department. He has a B.A. degree in English/Professional Writing from the College of New Jersey.

As our Special Projects Manager, Scott has worked on various conferences and special events. As the Department Manager for 25 years, Scott worked with a total of 10 chairs and one acting chair. He estimates that his hand was on the appointment forms of well over 200 junior and senior faculty, a high number of visitors, and many, many visa-related issues over the years. Each chair brought his or her own perspective to the task and each worked very closely with Scott as the department manager. As he looks back on those years, he remembers fondly the staff members with whom he worked, the faculty members who came into the department as relatively inexperienced postdocs and then returned years later as tenured faculty, the Fields Medals, Fermat's Last Theorem, as well as all the everyday events of a busy, world-class mathematics department.

Scott served on many University committees and was one of the early members of the Academic Managers Group (AMG) on campus, serving as chair and co-chair of the AMG and heading various AMG subcommittees. He received the 1998 AMG award for "his outstanding leadership, excellence in management, and continuing belief in the continuing education of academic managers" from his peers.

Scott and his wife, June, a retired Trenton school teacher, have three grown children, a daughter-in-law, and a 7-year-old granddaughter. They plan to relocate to the beautiful Blue Ridge Mountains of North Carolina and to continue to travel as much as possible.

Scott has worked steadily for over 40 years and is looking forward to pursuing other interests in this next phase of his life: relearning the piano, working with stained glass, and writing. He will always cherish his years in the Princeton Math Department and remember all the people with whom he was fortunate enough to come in contact during his tenure.

Kathleen Applegate

Kathleen Applegate, our Deparment Manager, was awarded the 2014-15 President's Achievement Award for her outstanding contribution to the Mathematics Department and as a citizen of the University. She joined the staff in the Department of Mathematics in September 2012.

Farewell party for Alberta Molnar who left our department to become a manager for the Sponsored Research Accounting Administration.

Eszter Rudy

Business and Grants Manager

The Mathematics Department welcomed Eszter Rudy as our new Business and Grants Manager in January, 2015. (Her predecessor, Alberta Molnar, accepted a position as the manager in the Sponsored Research Accounting Administration in the Office of the Vice-President for Finance and Treasurer in December, 2014.) Eszter comes to the Mathematics Department from the Department of Operations Research and Financial Engineering, where she had been Grants Manager since September 2012. Prior to coming to Princeton, she held positions at Temple University and in various public health arenas.

Eszter has a Master of Public Administration from Syracuse University and B.A.'s in International Studies as well as in Italian Studies from Dickinson College.

In her role as the Business and Grants Manager, she will work closely with the Chair and Department Manager monitoring departmental finances and handling all grant-related activities, working closely with Carrie Heyer, the Assistant Business and Grants Manager.

Eszter was born in Hungary and moved to the United States at the age of 12. She lives with her husband and their two young sons in Pennsylvania.

Adrian Banner *2002

Adrian Banner never left Princeton after obtaining his Ph.D. in 2002, he just moved to the other side of Nassau Street; he is now the chief executive officer and chief investment officer of INTECH, an institutional equity management firm

Adrian joined the firm in August 2002 and since then has been an integral part of the firm's Princeton-based research team.

INTECH uses a purely mathematical approach, through stochastic calculus, to the equity investment process. Its unique investment process is based on a theorem published by Dr. Robert Fernholz '62 in his 1982 paper, *Stochastic Portfolio Theory and Stock Market Equilibrium*. The goal of the investment process is to achieve long-term returns that outperform the benchmark index, while controlling relative risk and trading costs.

INTECH

Robert Fernholz, Ph.D., who founded IN-TECH Investment Management LLC in 1987, is also an alumnus of our department. He received his A.B. in Mathematics from Princeton University in 1962 (Ph.D. from Columbia University in 1967) and is currently a member of the Board of Trustees of the Institute for Advanced Study.

He pioneered mathematical investing with the publication of *Stochastic Portfolio Theory and Stock Market Equilibrium* in 1982.

INTECH takes advantage of its proximity to Princeton University by engaging in academic collaborations and conferences with MathApplied Math/ORFE as well as by hiring summer interns and graduates. Currently working at or with INTECH are: mathematicians Phillip Whitman*10 and Assistant Professor Mykhalyo Shkolnikov; physicist Vassilios Papathanakos; and, soon, applied math alumnus Onur Ozyesil.

in Adrian's own words...

In 2000, I did a summer internship at IN-TECH after completing my third year of graduate studies. I had never been interested in finance beforehand, but wanted to widen my horizons. During the internship, I discovered that INTECH puts a heavy emphasis on theory -- especially probability theory and stochastic calculus -- as well as applying the scientific method to investing. While other financial services companies often have strong ties with academia, INTECH has always had a combined focus on theoretical, academic research with the practical application of money management, which really appeals to me.

My training is in pure mathematics and, as such, it is always an interesting challenge to work out how to bridge the gaps between theory and observations.

It is also very gratifying to be able to provide an option for pension funds throughout the US and the rest of the world

to use rigorous mathematics to manage money for their constituents' retirement funds.

As a student of mathematics I learned to focus on solving difficult problems over a long period of time. From Eli Stein (my advisor), I learned how to get to the "heart of the matter" without getting distracted by less important but superficially attractive aspects of the problem.

Music is my main hobby; playing the piano is a wonderful release from stress. Also, my lifetime of performing has made me very comfortable presenting in front of crowds.

I still play on weekends at concerts. My band, the Klez Dispensers (originally a student band at Princeton) still performs a few times a year -- even at New York restaurants! My wife is a violin teacher and player by profession, and our children are showing early signs of musical aptitude too. It is fun to play together as a family!

Before entering the world of finance Banner spread his love of mathematics through his teaching at Princeton. His successful lectures are available on video and their content collected in a book praised for being "one of the clearest mathematics texts" and "an indispensable volume for any student seeking to master calculus."

The Calculus Lifesaver: All the Tools You Need to Excel at Calculus is published by the Princeton University Press.
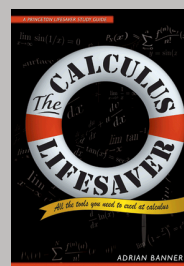
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You can download the videos from:

vimeo.com/PrincetonUniversityPress

Name	Undergrad	Advisor	Field	Thesis Title	Original Placement
An, Xinliang	Peking University	Klainerman	Analysis	Formation of trapped surfaces in general relativity	University of Toronto (1 yr.) & Rutgers University (3 yrs.);Postdoc
Lewallen, Sam	Harvard University	Szabo	Topology	Floergåsbord	Princeton University/ Department of Neuroscience/Postdoc
Miller, Alison	Harvard University	Bhargava	Number Theory	Counting simple knots via arithmetic invariants	Harvard University/NSF Postdoc/Benjamin Pierce Fellow
Pollack, Aaron	Duke University	Skinner	Number Theory	Rankin-Selberg integrals in many complex variables and Rankin-Selberg integrals associated to non- unique models	Stanford University/NSF Postdoc
Racz, Bela	Eotvos Lorand University, Hungary	Szabo	Topology	Geometry of (1,1)-knots and knot floer homology	Two Sigma Investments, NY/Researcher
Reichert, Nicolas	University of Washington	Chang	Conformal Geometry	Some results on a full nonlinear equation in Conformal Geometry	Acting Assistant Professor/ University of Washington
Seed, Cotton	MIT	Szabo	Topology	Higher differentials on Khovanov homology	Postdoctoral Associate/ MIT
Shah, Shrenik	Harvard University	Skinner	Number Theory	p-adic approaches to the Langlands program	Columbia University/NSF Postdoc
Sosoe, Philippe	McGill University	Aizenman	Math Physics	Fluctuation bounds for two disordered models	Harvard University/ Postdoc
Sun, Hongbin	Peking University	Gabai	Topology	On closed hyperbolic 3-manifolds and pseudo-Anosov maps	UC Berkeley/Morrey Assistant Professor
Tsiokos, Eleftherios	University of Athens	Skinner	Number Theory	Integrals of automorphic forms and L-functions	Tel Aviv University/Postdoc
Tu, Yu-Chao	Peking University	Kollár	Algebraic Geometry	Étale covering between resolution of isolated singularities and Gaffney-Lazarsfeld theorem for homogeneous spaces	University of Utah/Postdoc
Zhan, Bohua	MIT	Szabo	Topology	Combinatorial methods in bordered Heegaard floer homology	MIT/NSF Postdoc
Zhang, Yu	Peking University	Ionescu	Analysis	On the global solutions of quasilinear dispersive equations	UCLA/Visiting Assistant Professor
Zong, Runpu	University of Science and Tech, China	Kollár	Algebraic Geometry	Topics in birational geometry of algebraic varieties	IAS Member

PRINCETON UNIVERSITY

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news@math.princeton.edu

We are very grateful to our recent major donors:

The Fernholz Foundation for its generous funding of the Minerva Lectures and the Minerva Distinguished Visiting Professor program and its support of our graduate program.

The Class of 1971 Endowed Fund for Mathematics for discretionary support to strengthen the mission of the Department of Mathematics.

The Wei-Tong Shu *90 Fellowship Fund to provide financial assistance to Math Department graduate students.

A bequest from the Bradford H. Arnold *42 and Mary Ellen Arnold Fellowship Fund to provide financial assistance to selected graduate students studying in the mathematics department.

A bequest from Jane H. Lukens W30 to establish the Jaywood Lukens '30 Scholarship Fund for undergraduate scholarships in memory of her husband, Jaywood Lukens, "for whom mathematics was fundamental in his profession as an actuary and for whom mathematics 'was always fun.'"

The Sarnak conference (on page 9)

Bio mathematics in the time of Shakespeare

Fun facts

Mathematics was the key to the descovery of the circulation of blood. In the early 1600s Harvey, using a method introduced by Galileo, in the new physics, for the first time used mathematics in the study of the human body. Harvey calculated that the weight of the blood flowing through the heart in one hour was more than three times that of the entire body. That proved wrong the theories of the time, which assumed that blood was produced by the liver and absorbed by the body and Harvey, after various experiments came to the conclusion that the blood circulated through the veins and arteries and was pumped by the heart, a theory that was not easily accepted during his lifetime.