Endowed faculty positions enrich department culture

The Department of Mathematics is pleased to announce that a new endowed faculty position and two new visiting professorships have been established thanks to generous gifts from alumni and friends.

The Robert and Ann Canary Professorship in Mathematics has been established by Ken Fine and Rebecca Canary to honor Ann, Rebecca's mother, and in memory of Robert, her father. Ken Fine was born in Detroit, Michigan. He earned his BS (1963), MS (1965) and PhD (1967) degrees in mathematics at Illinois. Fine began his career in the computer industry, ultimately specializing in semiconductors. He retired in 1994 as a Vice President of Intel Corporation but came out of retirement in 1995 to be President/CEO of Vivid Semiconductor Corporation, from which he permanently retired in 1997. Ken served on the department’s Mathematics Development Advisory Board from 2010-2012, and on the department’s Strategic Planning Committee in 2013.

Rebecca Canary was born on Long Island, New York, and is a graduate of the University of California, Davis. The majority of her professional career was in technical recruiting at Intel Corporation, where she and Ken met. They married in 1990 and now live on a ranch in rural Texas. In addition to being part-time ranch hands, Rebecca is an artist, and Ken is a woodworker.

The endowment provides substantial funding to support the activities of the outstanding mathematician who will hold the Canary Professorship. This faculty search, which began this fall, is an exciting opportunity to attract a world-class senior mathematician to join our department.

Ken Fine and Rebecca Canary have also established an endowment to support semester-long visits of distinguished mathematicians to our department. These mathematicians will be known as the Waldemar J. Tjitzinsky Visiting Professor in Mathematics in honor of Professor Waldemar Tjitzinsky.

U of I moves forward with Altgeld Hall renovation

This fall, there were significant developments in the plans to renovate Altgeld Hall and replace Illini Hall with a state-of-the-art classroom and research facility that will have momentous implications for the departments of Mathematics and Statistics as well as the entire campus.

Campus is going to raze and replace Illini Hall. Details remain to be worked out, but a new data science center is part of the $500 million state capital funding initiative for the Discovery Partners Institute and Illinois Innovation Network (IIN). The data science center will be housed in a new building on the site of Illini Hall, and the new building will also be used by the departments of Mathematics and Statistics. The Altgeld Hall renovation, meanwhile, will receive funding from campus in addition to donations and other sources, some of which have already been secured.

We are extremely excited by this news. Altgeld Hall and Illini Hall have become too obsolete for the departments of Mathematics and Statistics. The renovation of historic Altgeld Hall, built in 1897, along with a new 60,000- to 80,000-square-foot building, will provide these units with
Dear friends,

Momentous changes are in the works at Illinois! I’m excited to extend my interim appointment to a longer term as Department Chair at this critically important moment in our department’s history.

A major news item this fall was the University’s announcement that Illini Hall will be replaced with a new, state-of-the-art educational and research center devoted to data science, mathematics and statistics. The project will receive funding from the State of Illinois through the Discovery Partners Institute and the Illinois Innovation Network. As such, it will position the new building as a central contributor to campus-wide initiatives focused on the interdisciplinary role of data science. At the same time, the renovation of Altgeld Hall will receive funding from campus, from a generous commitment by Illinois students through the Academic Facilities Maintenance Fund Assessment, and from private donations.

This news is extremely welcome. Our faculty contribute to modern data science in a myriad of ways; I encourage you to peruse the following pages to see numerous examples of these contributions. Renovated and rebuilt facilities are an important component of our department’s strategic plan. They will enable us to teach and collaborate in new ways. We are grateful to the campus administration and to Illinois students for their commitments to this project.

Newly endowed faculty positions will enrich the department’s research atmosphere and provide new opportunities for collaboration. Professor Kevin McGerty of the Mathematical Institute of the University of Oxford will join our department during Spring 2019 as a Fisher Visiting Professor of Mathematics. Other endowments, provided by alumnus Dr. Kenneth Fine and Rebecca Canary, will fund additional distinguished visiting professorships in future years as well as the newly endowed Canary Professorship in Mathematics. We are currently searching for a new faculty hire to fill this distinguished position.

Be sure to check out the inspiring student and alumni profiles throughout this issue of Math Times. Our student chapter of the Association for Women in Mathematics (AWM) was honored with the 2018 AWM Student Chapter Award for Community Outreach. This nationally competitive award recognizes the exceptional work done by the Illinois student AWM chapter in partnering and engaging with our local community. Graduate students also play a decisive role in administering and organizing the Summer Illinois Math Camp for local middle and high school students.

I’m honored to have the opportunity to lead the department during the coming years in pursuit of our shared goals of mathematical excellence and global impact.
Alex Bourd

By Jim Dey

He grew up in Russia, studied at the University of Illinois and now works as a principal engineer at California-based Qualcomm. Alex Bourd has really gotten around and done a lot in his math-propelled career.

“Probably one-fourth of the Earth’s population has used 3D graphics processors that I helped design,” said the 49-year-old Bourd, who came to the UI’s mathematics department in 1994 to pursue graduate studies.

That description barely scratches the surface of Bourd’s academic and professional career, a circuitous route that began with tutoring from his math professor father and led to the UI, where he “learned from and interacted with great scholars” and “many talented students” who had a major influence on his life.

“I met many future friends with whom I’ve maintained a relationship for over 20 years. The UI also provided a great environment for me to learn about American life and find my bearings after emigration,” Bourd said.

Bourd grew up in Yaroslavl, northeast of Moscow, where his mother was a computer lab administrator and his father a mathematician at Yaroslavl State University. Between his father’s tutoring and access to computers at his mother’s lab, Bourd said he became “very interested” in electronics and would have liked to study it in college. “However, that year was 1986, and in those days most of the colleges and jobs related to microelectronics in Russia were defense-oriented and secret. Jews were generally not welcome,” he said.

Instead, Bourd enrolled at Yaroslavl State to study mathematics and computer science. By 1991-92, after the collapse of the Soviet Union, Bourd said his country was “opening more and more” to the West and there were opportunities to study in the United States. But that required English fluency, so Bourd set about learning a third language (beyond Russian and French).

Bourd passed the necessary examinations to study abroad. He also benefitted from translating computer science lectures from English into Russian that were being given by an American professor visiting Yaroslavl State as part of an exchange program. He said the experience “really helped me advance my English.” The visiting professor also helped Bourd gain admission to the University of Connecticut. Seeking a “higher caliber” university Bourd transferred to the UI in 1994, where he became an assistant to Professor Joe Miles.

Bourd said his experience at the UI was both exhausting and exhilarating. In addition to his duties as a teaching assistant, Bourd said he was a researcher at the National Center for Supercomputing Applications “programming virtual reality applications in collaboration with Professor George Francis’ group as well as computational biology with Dr. Marcus Wagner.” Bourd described the experience as “two and a half years of constant brain work” that left him exhausted.

Eager to remain in the United States but desiring a break from his doctoral studies, Bourd sought and was offered a job in 1996 as a software engineer at Qualcomm, the world’s largest fabless semiconductor company. Founded in 1985 in San Diego, Calif., Qualcomm designs and markets wireless telecommunications products and services. He completed his doctorate in 2003 under the direction of advisors Jared Bronski (Illinois) and Donald Lutz (San Diego State Univ).

Over the years, Bourd and Qualcomm have grown together. He recalled that “when I joined” the company it had 5,000 employees and a $2 billion capitalization. “A few years later, it grew to 35,000 employees and a $120 billion capitalization,” he said. As Principal Engineer at Qualcomm, Bourd is modest about his contributions to his employer.

“I did contribute to a few programs, especially Adreno GPU (specialized 3D graphics processors) over the last 15 years. This program started with a bunch of people who barely knew what they were doing and ended up shipping 1 billion units per year over the last few years,” he said. “My other significant contribution was to the Open Compute Language (OpenCL) industry standard for high performance heterogeneous computing."

He now resides with his wife and their two children (a daughter, 15 and a son, 12) in the San Diego suburb of Rancho Penasquitos. Bourd’s wife studied English at Parkland College in Champaign and later earned an advanced degree in finance. She’s a tennis enthusiast and volunteers at school and their synagogue.

Bourd said his daughter is “interested in mathematics and medicine” and piano and that he’s teaching his son “various skills, such as fishing.” Work remains demanding, but Bourd said he finds time to coach his son’s soccer and robotics teams, read science fiction and pursue his “lifelong hobby of road biking.”

Jim Dey is a columnist and editorial writer for The News-Gazette in Champaign-Urbana.
The tipping point

by Logan Weeter, LAS News 2/20/2018

Tipping has become a prominent part of food service culture since it was introduced in the 19th century. That’s not to say it goes without debate—and a mathematics postdoctoral researcher has found that there is a point where restaurants would be better off eliminating the practice altogether. Sara Clifton, a J.L. Doob Research Assistant Professor in the Department of Mathematics at Illinois, noticed the contention between tipping and no-tipping establishments and set out to determine if there is a tip rate when gratuities change from being economically beneficial for restaurants to one that restaurant owners would be smarter to avoid.

“I kept reading these articles and wanting to know when the no-tip trend would finally take over like it already has in other countries,” said Clifton, whose research has been published in Chaos: an Interdisciplinary Journal of Nonlinear Science. “No one was really answering that question to my satisfaction, so I decided to try myself.”

According to experts including Michael Lynn, a professor of consumer behavior at Cornell University, tipping in the United States began shortly after the Civil War in the 1860s. Lynn’s studies suggest that aristocratic Americans took the custom of tipping from trips abroad to Europe and began the practice back home to prove their elevated education and class.

Clifton and colleagues created a model of restaurant competition to determine the economic point where it is wise for restaurant owners to eliminate tipping from their establishments. The model took into account basic service fundamentals, such as the fact that better-paying restaurants will have more talented employees, and that service, food quality, and price affects how many customers come to the establishment.

While waiters’ and waitresses’ take-home pay steadily increases along with the conventional tip rate, pay for cooks and other back-of-house employees generally does not rise with the tip rate. Despite the low federal minimum wage for tipped workers, Clifton’s paper said, “waiters consistently earn more than cooks. As the wage disparity increases, talented cooks may defect to restaurants where profits are shared more equitably among staff, and talented waiters may defect to restaurants with higher tips.”

“Tipping gums up the works, because waiters like tips,” Clifton said, “but cooks don’t like getting paid less than waiters because of tips, and diners don’t like paying an extra 20 percent at the end of a meal. Because the tip rate has been rising for many decades now, the tension has been growing between waiters, who love tips, and customers and cooks, who dislike tips.”

Clifton took these fundamentals and applied them to a set of restaurants, with one hypothetical restaurant that allowed tipping and another hypothetical restaurant that didn’t. Her research concluded that there is a specific “critical tip rate” (the exact value was undetermined) that decides the economic viability of tipping. If a restaurant’s tip rate was below this critical rate, tipping is a wise practice for restaurants, but if the tip rate is above the critical rate, it is more beneficial for restaurants to eliminate tipping.

Based on historical tip rates, Clifton says that she assumes that American cultures will continue to drive up the conventional tip rate, eventually making it economically beneficial for tipping to go away altogether. She also mentions that the removal of tipping can be socially beneficial, considering its origins and background.

Clifton hopes to continue improving the model so as to make more precise predictions regarding this critical tip rate as well as collaborate with local restaurants or economists for better data.
Oscar Rodrigo Araiza Bravo

by Jim Dey

Oscar Rodrigo Araiza Bravo—he goes by Rodrigo—got off to a slow start in his math studies, recalling that he needed help as a middle and early high school student.

“I was terrible at math,” he recalls. “My mother hired so many tutors. Then one day it clicked. I started to get better and better and better.”

There’s no doubt about that. The 22-year-old Araiza Bravo is scheduled to graduate with a straight A average from the University of Illinois in December 2018 with degrees in mathematics and engineering physics. He plans to begin graduate school in summer or fall of 2019. “That’s the plan,” said Araiza Bravo, who spent the summer of 2018 as a CalTech intern doing computational physics.

After completing his doctoral studies, he said he hopes to become a college professor who teaches and does research. “I enjoy teaching. If you ever want to find out whether you know a subject, teach it,” he said.

Born in Mexico City, Araiza Bravo came to the United States in October 2011 when his father, a senior engineer at the Tetra Pak packaging company, was transferred to Libertyville, IL. He graduated from Mundelein High School in 2014.

Araiza Bravo recalled it was both a big challenge and a stark necessity to learn to fluently speak English. He recalls one particular incident that gave him an extra incentive. “When you can’t ask for a doughnut at Dunkin’ Donuts, that’s when you know you have to learn the language” he said.

Araiza Bravo came to the UI after graduating from the Engineering Pathways program at the College of Lake County, a local community college. He said he was drawn here for a variety of reasons.

“(The UI) is affordable to me. It’s close to my family in Chicago. Finally, it has an extraordinary legacy in engineering, physics and math—all three of them,” he said.

Araiza Bravo said, from his perspective, the study of mathematics represents “the look for beauty.”

“I think there is beauty in solving problems from scratch,” he said. As for the appeal of physics, he said “it tries to look at nature in the simplest ways to explain really complicated phenomenon.”

In addition to being an award-winning teaching assistant in the Physics Department, Araiza Bravo has had ample research opportunities that have sparked his interests in condensed matter physics and quantum information theory. He particularly enjoyed working in the Illinois Geometry Lab, spending two semesters there studying mathematical physics using graph theory as a tool.

“That experience was wonderful. I would recommend it to any student interested in the mathematical sciences. It is an excellent way to get your feet wet in terms of research because it is well-structured and allows you to make connections with people who are interested in the same things you are,” he said.

Araiza Bravo doesn’t spend all his time on his studies. He’s always interested in a pickup game of soccer and loves to go to the bowling alley at the Illini Union, either by himself or with friends. It should be no surprise that he finds the math-related aspects of bowling—ball spin and angles—particularly interesting.

“I bowl quite a bit,” he said. “Once I retire, I would like to write a book about the mathematics of bowling.”

That time, of course, is a long way off. In the meantime, he’s keeping busy with his studies and trying to burnish his “skills in computations sciences” in case his career plans change. It keeps him pretty busy.

“There are ups and downs. But I have nothing to complain about,” he said.

Jim Dey is a columnist and editorial writer for The News-Gazette in Champaign-Urbana.
New support for actuarial science program

Two new funds have been established that will provide support for the Illinois Actuarial Science Program.

The Actuarial Science Alumni Scholarship fund has been created to provide scholarships to students majoring in actuarial science. We are pleased to announce that alumna Susan Morisato will provide a 1:1 match of up to $10,000 for this new fund. Donations made through December 31, 2018, are eligible for matching.

Morisato (BS Math and Education 1975; MS Mathematics 1977) works at UnitedHealth Group, and is currently the executive leading the Medicare supplement business at United Healthcare. She is a Fellow in the Society of Actuaries, a member of the American Academy of Actuaries, a member of the department’s Actuarial Science Advisory Board, and she served on the Mathematics Development Advisory Board from 2010-2014.

The Joseph and Joan Sintov Actuarial Science Endowment Fund was also recently created. The fund was established by alumnus Joseph Sintov (BS Actuarial Science 1971) and his wife Joan. Sintov worked in several insurance companies and consulting firms in California before he established his own practice in 2002. His career focused on employee retirement programs. He attained membership in the SOA as a Fellow, the American Academy of Actuaries and Conference of Consulting Actuaries. He was also an Enrolled Actuary under ERISA. He is now retired and is currently serving on the Actuarial Science Advisory Board. The Sintov fund will provide funds that can be used in a variety of ways to support the Illinois Actuarial Science Program including prizes for undergraduate research and experiential learning.

We count on the generosity of alumni and friends to fund scholarships that attract and support talented students as they embark on a world-class and innovative actuarial education at Illinois. To find out about all the ways you can support the Actuarial Science Program, please visit our website math.illinois.edu/giving.

Actuarial Science Reunion and Risk Analytics Mini-Symposium to be held in Chicago

We invite our actuarial science alumni to join us as we celebrate the 60th anniversary of the Actuarial Science Program at Illinois with an Actuarial Science Alumni Reunion and a Risk Analytics Mini-Symposium.

The Actuarial Science Alumni Reunion will be held on Thursday, May 16, 2019, from 4-7 pm in Chicago (location TBA). This is an excellent opportunity to catch up with classmates and network with new friends.

The Risk Analytics Mini-Symposium, to be held Friday, May 17, 2019, in Chicago (location TBA) will bring together practitioners, academics, and students to discuss the trending industrial research in actuarial science, risk management and advanced analytics. This will also be an opportunity to showcase the new Illinois Risk Lab’s research findings. The symposium is co-sponsored by the Illinois Risk Lab, the Office of Risk Management and Insurance Research (ORMIR) in the Department of Finance, and the Chicago Actuarial Association (CAA).

For more information and registration, go to math.illinois.edu/actuarial-reunion.
I-Risk Lab fosters research collaboration with actuarial/risk management professions and insurance industry

The Department of Mathematics at Illinois is proud to announce the creation of the Illinois Risk Lab. Modeled after the department’s highly successful Illinois Geometry Lab, faculty will develop a research conscious environment to foster active student group learning focused on practical research.

Students participating in the I-Risk Lab will learn how to conduct industry-relevant research and closely work together with experts in the field. Students will also have the opportunity to obtain funding to present their research at actuarial conferences.

The I-Risk Lab will host seminars throughout the year featuring leading experts in the fields of actuarial science, finance and risk management to educate students about industry trends. The lab will also host an annual mini-symposium to showcase its research findings as well as to provide a venue for exchanging research ideas with academics and practitioners in the actuarial and financial services community.

Klara Buysse will serve as the first Coordinator of the Illinois Risk Lab. She holds a Masters degree in Mathematics and an advanced Masters degree in Actuarial Science, both from the KU Leuven (Belgium). Buysse has worked in the insurance industry for many years in the field of risk management with expertise in various quantitative studies (solvency II, market consistent valuation, new business valuation, etc). She has a rare combination of both advanced actuarial training, extensive industrial experience and great passion for advancing practical research.

Other faculty providing support and expertise in the I-Risk Lab are

- Alfred Chong (PhD, ASA) Optimal insurance, investment strategies, stochastic control
- Runhuan Feng (PhD, FSA, CERA) Risk analytics, pension and retirement planning, market innovation in FinTech and InsurTech
- Daniel Linders (PhD) Quantitative finance, pricing and evaluation of investment-combined insurance
- Richard Sowers (PhD) Behavior and urban risk, sensing, and data analytics, and stochastic models.

Two of the current projects in the I-Risk Lab are

**Northwestern Mutual: evaluating fixed income portfolio management.** Evaluating the performance of an active manager in institutional fixed income portfolios is often challenging due to the necessary customization of issuance-based benchmarks to meet specific investment objectives. These constraints can be related to risk limits including factors such as aggregate credit quality, issuer concentration, or asset type. The I-Risk Lab is seeking to produce a better representation of the investment opportunity set a manager has available, based upon various portfolio management constraints and the investment process employed.

**Visualization of Sample Recycling Methods for Nested Stochastic Modeling.** As more regulatory reporting requirements in the regulatory regimes around the world move towards dependence on stochastic approaches, insurance companies are experiencing increasing difficulty with detailed forecasting and more accurate valuation and risk assessment based on Monte Carlo simulations. The I-Risk Lab will provide a visualization of sample recycling methods and make the new technology accessible to practitioners. The research team is expected to make a YouTube video to illustrate the technology.

Visit the I-Risk Lab website at math.illinois.edu/illinois-risk-lab.
Chelsea Walton

Associate Professor and Brad and Karen Smith Professorial Scholar
PhD 2011 University of Michigan

Chelsea Walton joined the mathematics faculty at Illinois as an associate professor this fall. She has also been appointed by the College of LAS as the Bradley M. and Karen A. Smith Scholar for a three-year term. The Smith professorial scholars fund was made possible by a generous donation by Karen Smith. Brad Smith received a BS in Actuarial Science in 1977 and was a member of the Mathematics Development Advisory Board from 2010-2014.

Walton received the 2018 André Lichnerowicz Prize in Poisson Geometry for her notable contributions to Poisson geometry. The Lichnerowicz Prize is awarded every two years at the International Conference on Poisson Geometry in Mathematics and Physics, to researchers who completed their doctorates at most eight years before the year of the conference. It is awarded by a jury composed of the members of the scientific/advisory committee of the conference.

Walton grew up in Detroit, Michigan, and attended Michigan State University and the University of Michigan for undergraduate and graduate school, respectively. She was a visiting student at the University of Manchester in England where one of her PhD advisors, Toby Stafford, is now employed. Walton graduated from University of Michigan in 2011, and her thesis was co-advised by Professor Karen E. Smith.

After postdoctoral positions at the University of Washington, MIT, and MSRI, she became a tenure-track assistant professor at Temple University in Philadelphia in fall 2015. Walton’s area of experience is noncommutative algebra and her work intersects with various geometric fields. She lives in Urbana with her husband Matthew Abbatessa and two dogs Mr. Mischief Maker and Dr. Thaddeus Arbuckle Boom-Boom III.

Daniel Berwick-Evans

Assistant Professor
PhD 2013 UC Berkeley

Dan Berwick-Evans grew up in Seattle. After completing a masters in physics at University of Cambridge, he got his PhD at UC Berkeley under the supervision of Peter Teichner. He was a J. L. Doob Research Assistant Professor in the department in 2017-2018. Dan’s research interests lie at the crossroads of algebraic topology and mathematical physics. His hobbies include rock climbing, kayaking, backpacking, and gardening.

Alfred Chong

Assistant Professor
PhD 2017 University of Hong Kong/King’s College London

Alfred Chong grew up in Hong Kong. He completed his joint PhD in Actuarial Science from The University of Hong Kong and King’s College London in 2017, under the supervision of Ka Chun Cheung and Gechun Liang. Prior to his current tenure-track position as an Assistant Professor in the Department of Mathematics and the Department of Statistics, he was a J.L. Doob Research Assistant Professor in the Department of Mathematics. He is also an Associate of Society of Actuaries. His research interests include optimal insurance and reinsurance designs, premium principles and risk measures, in particular via indifference pricing and valuation, stochastic control and backward stochastic differential equations, and optimal investment and forward performance preferences.
Adam Dor-On
J.L. Doob Research Assistant Professor
PhD 2017 Waterloo University

Adam Dor-On grew up in Mitzpe Ramon, in the south of Israel. He did his undergraduate and masters studies at Ben-Gurion University of the Negev, in Be'er Sheva, Israel. Seeking a career as a mathematician, Adam decided to move to Canada for his PhD in 2013. He was trained there as an operator algebraist by Kenneth R. Davidson at University of Waterloo and graduated in 2017. In the academic year of 2017-2018 Adam spent one year as an Azrieli postdoctoral fellow at the Technion in Haifa, Israel. Today Adam’s interests continue to grow, and he is working on topics related to operator theory, dynamical systems, graph theory and non-commutative convex geometry.

Aron Heleodoro
J.L. Doob Research Assistant Professor
PhD 2018 Northwestern University

Aron Heleodoro was born in Rio Claro, Brazil. He started his undergraduate studies in Physics at the Universidade de São Paulo. Since he was always motivated by the mathematical aspects of Physics, after two years he decided to pursue a double degree program with Ecole Polytechnique. After experimenting with different areas of theoretical physics in France, he got a Masters degree in Quantum Physics. At that point he realized that he wanted to do research in Pure Mathematics. He then came to the US and got his PhD in 2018 from Northwestern under the supervision of Nick Rozenblyum. His interests are in algebraic geometry, representation theory and K-theory from the perspective of Tate objects. In his free time he enjoys cooking and exploring Chicago with his fiancée.

Pavlos Motakis
J.L. Doob Research Assistant Professor
PhD 2015 National Technical University of Athens

Pavlos Motakis grew up on the Greek island of Crete. He completed his undergraduate and doctoral studies at the National Technical University of Athens, where he studied under Professor Spiros Argyros until 2015. He was a Visiting Assistant Professor (postdoc) at Texas A&M University between 2015 and 2018. His main area of research is functional analysis and specifically Banach space theory. Among other topics, he is interested in finding connections between asymptotic properties of Banach spaces and operator theory or metric geometry.

Ronnie Chen
J.L. Doob Research Assistant Professor
PhD 2018 Caltech

Ronnie Chen is from Vancouver, Canada. He completed his undergraduate degree at the University of British Columbia, and his PhD at Caltech under the supervision of Alexander Kechris. His research interests are in mathematical logic, specifically descriptive set theory and its connections with ergodic theory, model theory, and categorical logic/topos theory. He has worked on the classification of countable Borel equivalence relations, as well as investigating the relationship between infinitary logic and topological groupoids.
New faces

Eddie Nijholt
Visiting Postdoctoral Researcher
PhD 2018, Vrije Universiteit Amsterdam

Eddie Nijholt grew up in the town of Arnhem, the Netherlands. He completed his double Bachelor’s degree in mathematics and physics at the University of Amsterdam (UvA), and continued this interdisciplinary theme in his Masters degree in mathematical physics, also at the UvA. During this time he studied Poisson Lie-groups under professor N. Reshetikhin, which first established his interest in the role of algebraic structures in dynamical systems. After this, he focussed on network dynamical systems as a PhD student at Vrije Universiteit Amsterdam. During this time, he and professor Bob Rink researched the role of hidden symmetry in such systems, with a special emphasis on synchrony breaking bifurcations. By receiving the Dutch Rubicon grant, Nijholt was offered a chance to further expand upon this research as a postdoc at the Illinois. Together with professor Lee DeVille, he now tries to adapt techniques from the classical study of group symmetry to the more exotic algebraic structures found in networks. His main research interests include (network) dynamical systems, equivariant dynamics, and representation theory.

Egbert Rijke
Postdoctoral Research Associate
PhD 2018, Carnegie Mellon University

Egbert Rijke grew up in the Netherlands, where he completed his Bachelors and Masters degrees in Mathematics at the University of Utrecht. In the year following his masters degree, he participated in the 2012-2013 Special Year on the Univalent Foundations of Mathematics at the Institute for Advanced Study. After a year of traveling through Europe, he started his PhD in 2014 at Carnegie Mellon University, which he completed in 2018 under supervision of Steve Awodey. His research interests include homotopy type theory and higher category theory.

Shiang Tang
J.L. Doob Research Assistant Professor
PhD 2018 University of Utah

Shiang Tang grew up in Shenyang, China. He completed his PhD in 2018 from the University of Utah under the supervision of Stefan Patrikis and Gordan Savin. His research interests include algebraic number theory, especially the Galois and automorphic aspects of the Langlands program.
Iftikar Ahmed
Instructor
MS 2014 University of Illinois at Urbana-Champaign
Iftikhar Ahmed completed his undergraduate degree in mathematics in 2009 with distinction from COMSATS University, Pakistan. In recognition of his stellar academic performances throughout the undergraduate program, he was awarded Institute Gold and Campus Silver medals in 2010. In 2012, he moved to the University of Illinois at Urbana-Champaign where he completed his Masters in applied mathematics in 2014. Currently, he is pursuing his PhD in applied mathematics under the direction of Professor Zoi Rapti. His research work focuses on mathematical modeling of infectious diseases.

Jer-Chin Chuang
Lecturer
PhD 2007 Rice University
Jer-Chin (Luke) Chuang was born in Taiwan and grew up in Louisiana. He received his undergraduate degree from Furman University with a double major in mathematics and computer science. Afterwards, he completed his PhD in 2007 at Rice University under Robin Forman. He has held positions at Duke University, Georgia College and State University, and the University of Colorado Denver, the latter at their satellite program in Beijing. His mathematical interests are applied algebraic topology and differential geometry.

Paa Kow Cole
Instructor
MS 2005 University of Hull, UK
From 2006 to 2016 Paa coordinated the actuarial science program at the University of Cape Coast, Ghana, West Africa. Paa completed his Master's degree in mathematical finance at the University of Hull, United Kingdom. He trained as a high school mathematics teacher for his first degree at the University of Cape Coast. Paa served on the Actuarial Capacity Development Committee in Ghana from 2007-2016. In recognizing the role he played in actuarial science education in Ghana, the International Actuarial Association invited him to the World Congress of Actuaries in 2014 to share his success story with members from other countries where actuarial science is not popular. Paa moved to the United States in December 2016 to be with his wife and two daughters. He is a Christian, loves to sing hymns and an ardent fan of Arsenal football Club.

Dane Skabelund
Lecturer
PhD 2018 University of Illinois at Urbana-Champaign
Dane Skabelund grew up in Santa Rosa, California. After studying mathematics at Brigham Young University, he completed his PhD at University of Illinois under the direction of Iwan Duursma. His research interests include number theory and algebraic curves, and applications of these to coding theory and algebraic complexity theory. When not doing mathematics, Dane enjoys reading, ringing the bells in the Altgeld Chime Tower, and spending time with his wife and three children.
Rui Loja Fernandes named Simons Fellow

Rui Loja Fernandes has been named a 2018 Simons Fellow in Mathematics. The Simons Fellows programs in Mathematics and Theoretical Physics provide funds to faculty for up to a semester-long research leave from classroom teaching and administrative obligations. It is awarded every year to around 40 mathematicians in the USA and Canada.

Fernandes (PhD 1994, University of Minnesota) joined the Department of Mathematics in 2012 as the Lois M. Lackner Professor of Mathematics. Before that, he was professor and chair of the Department of Mathematics at IST-Lisbon, Portugal. His research is in the broad area of Differential Geometry and centers in aspects of Poisson Geometry, Lie Theory and Integrable Systems.

Prof. Fernandes will spend his year-long sabbatical at Utrecht University in the Netherlands during fall semester and at IMPA in Brazil during spring semester.

Vesna Stojanoska named Fellow in Center for Advanced Study

Assistant Professor Vesna Stojanoska has been appointed as a Fellow in the Center for Advanced Study at the University of Illinois for 2018-2019. Stojanoska’s research is in stable homotopy theory, especially as it relates to arithmetic. The usual connection between these areas stems from work of Quillen in the 1960s, and organizes homotopy theory in terms of arithmetic objects called formal group laws. A slightly less ubiquitous but equally fruitful combination of the two areas is based on ideas of Grothendieck, and involves using homotopy theory to study questions in arithmetic. Stojanoska’s work to be done under the CAS appointment fits in the latter category.

Poincaré duality is a classical result in algebraic topology, with numerous improvements, generalizations, and analogues in various areas of mathematics. One notable example comes from number theory: Formally adding solutions to rational polynomials, and studying their interrelationships, ultimately leads to the creation of a shape whose characteristics resemble that of a manifold. The algebraic avatar of a duality phenomenon in this setting was studied by Tate and Poitou in the 1960s, and goes under the name arithmetic duality. Basic principles in homotopy theory lead to the observation that if one coherently adds information about continuous deformations of those polynomial solutions, a stronger, homotopical version of duality should hold. The goal of Stojanoska’s CAS project is to formalize this, as well as use the result to explore new obstructions to solving polynomial equations.

To facilitate this research, Stojanoska will participate in two research programs: Homotopy Harnessing Higher Structures at the Isaac Newton Institute in Cambridge, UK, for part of the fall semester, as well as Derived Algebraic Geometry at MSRI in Berkeley, CA, for part of the spring semester.

ASL awards Karp Prize

The ninth Carol Karp Prize was awarded to Matthias Aschenbrenner (PhD 2001 Univ. of Illinois; advisor van den Dries, and now at UCLA), current Illinois faculty member Professor Lou van den Dries, and Joris van der Hoeven (CNRS) for their work in model theory, especially on asymptotic differential algebra and the model theory of transseries. The prize was awarded at the Association for Symbolic Logic (ASL) North American Annual Meeting in May 2018. The Karp Prize, established in 1973 in memory of Professor Carol Karp, is awarded every five years and given on the recommendation of the ASL Committee on Prizes and Awards, for a “connected body of research, most of which has been completed in the time since the previous prize was awarded.”
Illinois reception at 2019 joint math meetings

The 2019 Joint Mathematics Meetings will be held in Baltimore, MD, from January 16–19, 2019, at the Baltimore Convention Center, Hilton Baltimore, and Baltimore Marriott Inner Harbor Hotel.

The University of Illinois Department of Mathematics will host a reception from 6:00-7:30 pm on Friday, January 18, 2019 in Room Johnson A, Hilton Baltimore, 401 W. Pratt Street, Baltimore. Everyone ever connected with the department is encouraged to get together for conversation and to hear about mathematics at the University of Illinois.
Scholarships making a difference for students

Since 2012 the Illinois Department of Mathematics has committed $525,000 in scholarships to help 45 undergraduate students. This fall some of our current scholarship recipients got together to share with our readers what their scholarship means to them.

“I feel honored to be recognized for my mathematical accomplishments thus far, and I look forward to what I will achieve because of the opportunities offered by this scholarship,” said Ian Copple, a freshman majoring in actuarial science and physics.

All students who are admitted to an undergraduate degree program in the Department of Mathematics are considered for a scholarship. The department currently offers four-year $6000/year scholarships. With the total cost of attendance for an in-state student (including room/board, books, and other expenses) currently costing in the range of $31,012-$36,016, a scholarship can be a big help and is summed up well by Connor Farrell, a sophomore majoring in actuarial science. “My mathematics scholarship is a huge honor and has helped to lift the heavy financial burden that a university education can entail.”

Thanks to the generous support of our alumni and friends, the department continues to be able keep an Illinois education affordable for deserving students from all income levels and majors in the department, so that they can go on to solve the outstanding mathematical problems of our time.

“Every talented Illinois high school graduate should want to attend or at least consider the University of Illinois. We must compete for those students and Illinois Mathematics Scholarships are one way we can let these students know just how much we want them to come to the University of Illinois,” said alumnus David Hays.

Sonia John, a sophomore, said “The scholarship offered to me by the department has been a tremendous help for both me and my family, knowing that I will be able to get a quality education that is affordable for us. From my experiences at Illinois, I am confident that the Mathematics Department values each of its students and works for their best interests and pursuit of knowledge.”

Donating to our scholarship funds is an investment in our students’ future. Visit math.illinois.edu/giving/students to learn how you can help.

BIG Jobs Guide helps job seekers at every stage of career

Whether you’re an undergraduate or graduate student or a job seeker in mathematics, statistics, or operations research, the new book *BIG Jobs Guide* will help you reach your goal—landing an internship, getting your first job or transitioning to a new one.

Jobs using mathematics, statistics, and operations research are projected to grow by almost 30% over the next decade. *BIG Jobs Guide* helps job seekers at every stage of their careers in these fields explore opportunities in business, industry, and government (BIG).

Written in a conversational and practical tone, this book offers insight on topics such as what skills you can offer employers, how to write a high impact résumé, finding a rewarding internship, and what kinds of jobs are available.

The Guide also offers insights to advisors and mentors on topics such as how departments can help students get BIG jobs and how faculty members and internship mentors can build institutional relationships.

The book was co-authored by Rachel Levy (Harvey Mudd College), Richard Laugesen (University of Illinois at Urbana-Champaign) and Fadil Santos (University of Minnesota) and recently published by Society for Industrial and Applied Mathematics (SIAM).
who was Ken’s PhD thesis advisor. These visiting professors will share their expertise with faculty and students while they are in residence at Illinois.

This endowment is named for Waldemar Trjitzinsky who joined the Illinois mathematics faculty in 1934, where he remained until his retirement in 1969. During his tenure at Illinois, Trjitzinsky supervised 51 PhD students. He was a highly respected mathematician, dedicated to the advancement of mathematics, and educating future mathematicians. He financially helped students during his lifetime, and part of his estate funded the American Mathematical Society’s Waldemar J. Trjitzinsky Memorial Awards program, which provides scholarships to undergraduate mathematics students nationwide.

The department is excited about another new visiting professorship, the Fisher Visiting Professor of Mathematics, funded by a generous gift from University of Illinois alumnus Scott Fisher. The purpose of the visitors program is to inform the department of cutting-edge research and create opportunities for collaboration and networking with faculty and graduate students. In recognition of the importance of this position, the department honored the donor by naming the position after him. Fisher (BS 1972 Psychology, MS 1976 Computer Science) serves on the department’s Mathematics Development Advisory Board.

Professor Kevin McGerty will be the Fisher Visiting Professor of Mathematics during the Spring 2019 semester. McGerty, a Professor in the Mathematical Institute of the University of Oxford and a fellow of Christ Church College, Oxford, received his PhD from MIT in 2002 under the direction of George Lusztig and went on to a Dickson Instructorship at the University of Chicago. McGerty subsequently was awarded a prestigious Royal Society University Research Fellowship, which he held at Imperial College from 2006 to 2010 before moving to Oxford in 2010.

McGerty works in geometric representation theory and algebraic geometry. McGerty has explored the geometry and representation theory of symplectic resolutions and their quantizations using tools and techniques from geometric invariant theory, Lie theory, Morse theory, and noncommutative algebra, and yielding applications to the topology and representation theory associated to Nakajima’s quiver varieties.

The new endowed professorships build on our already existing endowed professorships: the Lois M. Lackner Distinguished Professor in Mathematics held by Professor Rui Loja Fernandes, and the Morris and Gertrude Fine Distinguished Professor of Mathematics, held by Professor Philippe Di Francesco.

“Funding from the Lackner Professorship has made it possible for me to interact in various modes for collaboration and research which are critical for success and leadership in my field,” says Professor Fernandes. These positions were established in 2012 through the generosity of alumna Lois M. Lackner who earned her BS and MS degrees in the teaching of mathematics, and a PhD in education, and Ken and Rebecca Fine who established the professorship in memory of Ken’s parents, Morris and Gertrude Fine.

Professor Di Francesco says that “Funding from the Fine Professorship has enabled me to focus on pressing problems in my field, make timely contributions, and help set the agenda for developing my field by making it possible for me travel to meet with leading researchers around the world.”

We are grateful to Kenneth Fine and Rebecca Canary, Scott Fisher, and Lois Lackner for endowing and funding these professorships. New faces and new ideas further enrich the vibrant intellectual culture of our department. We invite you to join us in supporting these worthwhile initiatives.
Summer mathematics camps

Some 80 local middle and high school students attended the fourth annual Summer Illinois Math Camp (SIM) this past summer held by the Department of Mathematics on the Urbana-Champaign campus. SIM Camp is a free, week-long day camp that introduces students to the creative, discovery-driven side of mathematics.

This summer’s courses included

- **Counting Pigeons and Other Problem Solving Techniques** where campers learned valuable mathematical techniques such as the pigeonhole principle and coloring arguments.

- **Maximize Your Winnings: Using Math to Understand Games** where campers played and explored a variety of games involving chance, strategy, social cooperation and anticipating the actions of others.

- In **Counting to Infinity (Plus One!** students learned how to show that different infinite sets have different sizes. Along the way they developed the basic elements of set theory and grappled with notions of orderings on infinite sets and maps between sets.

- **Snowflakes to Seashells: Exploring Fractals** gave students the opportunity to explore shapes with finite area and infinite parameter as they learned about fractals and chaos theory.

Each course is developed and designed by one mathematics graduate student and two undergraduate students from the mathematics Merit Program.

“Before this summer, I was hesitant with the idea of teaching, not sure if I was really capable of teaching others and not wholly confident in my mathematical ability. SIM Camp has put those worries to rest... I realized during camp how rewarding and truly enjoyable teaching others is and I had a great time being able to help these campers learn math they may have never seen before,” said one of the undergraduate staff members.

With support from the Department of Mathematics Outreach Fund and a Mathways National Science Foundation (NSF) grant, the Illinois Geometry Lab, and a Mathematical Association of America Dolciani Mathematical Enrichment Grant, the department was able to host these week-long camps at no cost to students.

SIM Camp is supported in part by the NSF under Grant Number DMS-1449269. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the NSF.

Delta camp students having fun on the steps of Altgeld Hall. “This was really fun! I will remember this when I get bored with or feel defeated by math. I also enjoyed meeting more people who enjoy and want to talk about math.”

Omega camp students constructing mathematical objects. “I learned how math is basically nothing like what I learned in school. I thought it was about formulas, memorization, and based only from a book; but it’s not. It’s so much more abstract and creative than I assumed it would be.”

Epsilon camp students on the Quad after a graph theory activity. “I love coming here and learning about new aspects of math not taught at school. It shows how what we’re learning is applicable and also shows how math can be creative, exploratory, and fun.”

Delta camp students having fun on the steps of Altgeld Hall. “This was really fun! I will remember this when I get bored with or feel defeated by math. I also enjoyed meeting more people who enjoy and want to talk about math.”
New Additions to NetMath

NetMath is pleased to welcome two new additions to the program: Aaron Wittrig joined NetMath as Assistant Director of IT in July, and Roger Burt became our Instructional Support Specialist in September. Both Aaron and Roger are alumni of the Department of Mathematics at Illinois: Aaron received a master’s degree in 2011; Roger received a bachelor’s degree in 2015 and a master’s degree in 2017.

Aaron will provide support for growth and improvement of NetMath’s instructional technology infrastructure. In addition, he will support development and maintenance of learning environments for current online mathematics courses and those under development. Previously, Aaron worked as a Senior Math Content Engineer at Wolfram Research Inc. in Champaign.

Roger will support instruction in NetMath. This includes training TAs and Partner High School teachers, developing instructional resources, and assisting with outreach and student recruitment efforts. Roger previously worked as a Student Academic Services Assistant at Wilbur Wright College in Chicago.

NetMath Summer Courses

NetMath offered nineteen Summer Session 2 courses through LAS Online this year. These 8-week options are intended for University of Illinois at Urbana-Champaign matriculating students who require term-based courses in order to qualify for financial aid or use their tuition waivers. This summer we debuted four new courses: Math 416, 441, 448 and 481. Our summer enrollment numbers were higher this year, with 308 student registrations.

News from NetMath

Altgeld renovation, continued

improved office and instructional space. And though Altgeld Hall will be modernized, the project also focuses on restoration. Current plans include the restoration of mosaics, murals, and woodwork in Altgeld Hall’s magnificent library. The projects will also allow for exciting new research and educational programs in data science.

Feng Sheng Hu, the Harry E. Preble Dean of the College of Liberal Arts & Sciences, said that the building and renovation projects will link the data science initiative through DPI to the departments of Mathematics and Statistics while providing the departments with long-needed infrastructure improvements. The two departments currently share the bulk of the space in Illini Hall.

Undergraduate enrollment in the departments of Statistics, Mathematics, and Computer Science have doubled in the last decade. The units also have deep connections with businesses that would serve IIN’s mission through internship agreements and alumni who work at Fortune 500 firms across the state and beyond. Faculty from the units are involved in interdisciplinary research that touches all fields at the core of IIN’s mission. The new facility will be an incubator for collaborative research and education in data science, which is rapidly growing to include faculty and students from all over campus.

“This has tremendous implications for the departments of Mathematics and Statistics, and the entire college,” said Hu. “The new data science center will be pivotal to further establishing LAS as a leader in this field, and, taken together, the building projects will allow for the incredible growth we’ve seen in the mathematical sciences to continue unabated.”

Students visit the NetMath booth at Quad Day this past August.
The University of Illinois Student Chapter of the Association for Women in Mathematics (AWM) has received the 2018 AWM Student Chapter Award for Community Outreach, awarded by the AWM in recognition of their outstanding engagement with the local community by highlighting women in mathematics and demonstrating the power and fascination of mathematics. This AWM Community Outreach award was presented at the 2018 MathFest in Denver, Colorado.

“Outreach activities benefit not just the intended recipients, but the organizers as well. AWM students experience firsthand the positive effect of their efforts on young minds and underrepresented groups. This in turn inspires them and influences their future careers and plans. Sharing knowledge and serving as a role model is probably one of the highest honors and sources of joy for academics,” said associate professor Zoi Rapti, the chapter’s faculty advisor.

Activities organized by the Illinois chapter include:

• Seminar series – one highlighting graduate student research and the other on issues related to teaching and diversity.

• Sonia Math Day, a one-day event for 8th-12th grade girls held in fall and spring semesters, has been on-going since 2013. This program encourages high school girls to consider pursuing higher education in math and science.

• Girls Engaged in Mathematics and Science (GEMS) Workshop is for 6th-9th grade girls. These math and art-themed workshops are held on four Saturday afternoons during spring semester and have been on-going since 2014.

“The Illinois AWM chapter is honored to be selected for this award,” says Emily Shinkle, president of the local AWM chapter. “Providing opportunities for students of all ages and socioeconomic backgrounds to experience and discover beauty in mathematics is a priority of our chapter. We’ve been fortunate to have an abundance of departmental support towards these ends, as well as many graduate students who have worked tirelessly to build the chapter into what it is today. I am excited by the opportunity to help the chapter continue to grow and expand our influence in the community around us.”

Rapti says, “My role as a faculty advisor was really minimal, the AWM students are truly exceptional. They have demonstrated an unparalleled commitment to community outreach and great dedication to inclusion and diversity. I am honored to serve as their mentor and extremely proud of them.”

Established in 2011, the University of Illinois Student Chapter of AWM seeks to provide a community for women graduate and undergraduate students in the Department of Mathematics through activities and to assist them in advancing in their careers through professional development opportunities. The officers and members of this chapter have received numerous awards and grants at local and national levels. AWM members are also busy working on their dissertations and can be found traveling to national conferences to present their research. Through their various outreach activities with local students in grades K-12, as well as the home-schooled community, they are expanding the future community of women mathematicians.

Visit the Illinois AWM website at math.illinois.edu/awm/.
Mathematics alumni joined current faculty and students to celebrate Homecoming 2018 on the lawn out front of Altgeld Hall.

Join us for Homecoming October 19, 2019

math.illinois.edu/homecoming
How I became a data scientist
by Bolor Turmunkh

First steps
At the beginning of my fifth year of graduate school at the University of Illinois, with thoughts of impending graduation, I started thinking for perhaps the first time in my life about who I wanted to be. I had lived happily as an information hermit for four years. I had spared little thought for anything other than academic research. It would have been handy if I had kept up with career trends, sought-after skills, or internship opportunities. But as they say, the secret of getting ahead is getting started. So, I buckled down and got started.

After a quick google search on trending careers of the future and cross-referencing the required skills with my own past experiences, I landed naturally on data science.

What is data science?
A famous Venn diagram (google “data science Venn diagram”) defines data scientists as having skills at the intersection of coding, statistics, and domain expertise. They are the people who take a business problem, go prospecting for available and attainable data, re-formulate the question in technical terms, design and implement a statistical and machine learning task, and re-interpret the results for the business client to ultimately answer the original question. That makes it sound like to be a data scientist you need to be a statistician and a computer scientist with years of industry specific experience. That’s not quite true.

The reality is, data science is both vast and new, with specializations and sub-fields quickly developing. Highly sought-after data scientists are people who are broadly familiar with all aspects of data science while being experts in one or two fields. It is a highly achievable career for mathematics graduate students—with some preparation.

How did I become a data scientist?
From the moment I realized I would enjoy being a data scientist to finding my first internship, I spent 9 months devouring online and free courses on Machine Learning and Python, sent out dozens of applications, got two interviews, and lucked out with an employer who was willing to give me a chance. It was a small start-up in San Francisco developing enterprise software in Natural Language Processing.

During the three month internship, I learned intensely. My technical knowledge deficit was overwhelming at times. But here, my academic training was an asset. Living with overwhelming stress without it paralyzing you is arguably what “PhD grit” is all about. This internship was just the beginning of my journey to becoming a data scientist. It took another two years and one failed job search cycle before I landed my current position at Uptake Technologies Inc. in Chicago.

How is being a data scientist different from being an academic?
Apart from conferences in my particular field in mathematics, and research meetings with my advisor, I had no peers with whom to engage in frequent and technical discussions of the details of my work. That is no longer the case in industry. Not only are my coworkers ready to get as nitty-gritty into my project as I wish to go, they also possess a wealth of experience dealing with similar projects and are happy to share their expertise. Learning in such an environment is exponentially faster than learning alone.

In industry, you won’t always get to decide what to work on. My team establishes quarterly priorities and project proposals together, which then go through a review process to make sure the proposals align with company goals. As a team member, your goal is to arrive at a good solution in the most efficient manner possible. Doing everything yourself is not the most efficient way. Getting help is not only highly recommended, but expected of you.

Closing thoughts
The qualifications and projects of a data scientist are quite different from those of an academic mathematician, and yet the actual work is quite similar in nature. The great majority of a data scientist’s time is spent defining and re-defining an ambiguous problem until it can be clearly stated, and then solved.

Once a data scientist finds interesting results, it is crucial to communicate them to the end customer. Building a story around a complex issue, supporting that story with evidence derived from data, and interpreting the results into a concrete recommendation for the customer, are the central tasks of the job. From this perspective, your graduate training in mathematics, statistics or operations research will provide a strong foundation for moving into data science.
Illinois alumna Mary Lynn Reed has received the University of Illinois, College of Liberal Arts and Sciences Alumni Achievement Award. Reed (MS 1990; PhD 1995 Mathematics) serves as chief of mathematics research at the U.S. National Security Agency (NSA).

Two days after planes struck the World Trade Center on September 11, 2001, Mary Lynn Reed began doing counterterrorism work at a research center in La Jolla, California—a center that does work exclusively for the National Security Agency. For Reed, this was actually a return to the NSA because she had already worked for the agency for several years in Maryland. That made it possible for her to go back to doing NSA work immediately.

Reed was promoted to the senior ranks in 2014, and in 2016 she became NSA’s chief of mathematics research—not bad for someone who thought she might not make it through the intense PhD program in math at Illinois. The NSA is the largest employer of mathematicians in the United States, and Reed manages roughly 10-15 percent of them. She has set directions for internal research at NSA in both mathematics and computer science, including recent developments in artificial intelligence and cryptanalysis.

In the midst of her pressure-cooker job, she tries to find time for her other passion—creative writing. Reed has published several short stories and is working on a novel. It’s a coming-of-age story about a young female mathematician—something she knows a fair amount about.

Reed was one of the first recipients of the Alumni Award for Outstanding Professional Achievement awarded by the Department of Mathematics in April 2018.

Neriman Tokcan, a Postdoctoral Assistant Professor of Mathematics and a Postdoctoral Research Fellow in the Biomedical and Clinical Informatics Lab at the University of Michigan, has received a University of Michigan Precision Health Scholar Award. Tokcan earned her PhD in Mathematics from the University of Illinois at Urbana-Champaign in 2017 under the supervision of Professor Bruce Reznick. She also received her MS in Mathematics from Illinois, and she received a BS in Mathematics from Cukurova University in Turkey.

“Despite my never-ending passion for mathematics, by the end of my PhD, my research was very far from my idea of science with tangible impact on people’s lives,” said Tokcan. “In planning my next career step, I wanted to reconcile my passion for mathematics and science that would have an immediate impact on people.”

Tokcan will use her award to research “A novel tensor similarity score for the classification of cardiac index,” which addresses the challenges of analyzing multidimensional data in biomedical data processing. “My career objective,” she says, “is to become a scientist who bridges disciplines to develop a science of tensor analysis, applicable in the context of precision health to manage cardiac conditions, traumatic brain injuries, and traumatic pelvic and abdominal injuries.”

The University of Michigan’s inaugural Precision Health Scholar Award program grants up to $80,000 each to support precision-health research. Twelve projects were selected from a pool of 60 strong applicants. The important and innovative research undertaken by these awardees advances Michigan Precision Health’s goal of promoting multidisciplinary collaborations across the university and providing the resources researchers need to expand their work.
Our most recent PhD alumni: where are they now

Anton Bernshteyn  
Postdoc, Carnegie Mellon University

Santiago Camacho  
Postdoc, Illinois Wesleyan University

Erin Caulfield  
Postdoc, McMaster University

Jooyeon Chung  
Senior Engineer, Samsung SDS

Dong Dong  
Research Associate, University of Maryland, College Park

Sakulbuth Ekvittayaniphon  
Lecturer, Rajamangala University of Technology, Thailand

Timothy Ferguson  
Postdoc, Arizona State University

Li Gao  
Visiting Assistant Professor, Texas A&M University

Tigran Hakobyan  
Software Engineer, Facebook

Nicholas Kosar  
Personify

Georgios Kydonakis  
Postdoc, Universite de Strasbourg, France

Melinda Lanius  
Research Postdoc, University of Arizona

Junxian Li  
Postdoc, University of Göttingen

Daan Michiels  
Quantitative Researcher, G-Research (gresearch.co.uk)

Cara Monical  
Computer Scientist (Senior Level), Sandia National Labs

Itziar Ochoa de Alaiza Gracia  
Lecturer, Yale University

Michael Oyengo  
Lecturer, Maseno University, Kenya

Ashish Kumar Pandey  
Tenure-track Assistant Professor, Indraprastha Institute of Information Technology, Dehli, India

Nima Rasekh  
Postdoc, Max Planck Institute, Germany

Dane Skabelund  
Lecturer, University of Illinois at Urbana-Champaign

Hao Sun  
Postdoc, Sun Yat-Sen University, China

Albert Tamazyan  
Software Development Engineer, Microsoft

Ebru Toprak  
Postdoc, MSRI (fall semester), Visiting Assistant Professor, Rutgers University (beginning spring 2019 semester)

Joel Villatoro  
Postdoc, KU Leuven

Zsolt Adam Wagner  
Postdoc, ETH, Zurich, Switzerland

Xiao Wang  
Data scientist, PCCI, Dallas, TX

Anna Weigandt  
Postdoc, University of Michigan

Argen West  
Data Scientist, Ascend-Innovations

Mingyu Zhao  
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Stay connected with Illinois mathematics

Look for “Illinois Department of Mathematics” on Facebook and LinkedIn to get the latest news and learn about upcoming events.

Check out our YouTube channel (https://www.youtube.com/user/MathMediaIllinois) where you’ll find a variety of videos about the department including the 2018 Department of Mathematics Awards Ceremony and the 2018 Departments of Mathematics and Statistics Convocation ceremony.

Moved recently? Update your contact information at www.las.illinois.edu/alumni/contact/form/.
We count on the generosity of alumni and friends to support students as they embark on earning a world-class education and to fund faculty members as they conduct world changing research and train students. Your investment makes a difference.

☐ Yes! I believe in the importance of excellence in mathematics and wish to show my support!

$_________ Mathematics Partnership Fund (332346 default)
Your gift to the Partnership Fund will have the widest impact as it supports a range of activities including student awards and travel, distinguished lecturers, the recruitment of excellent faculty, and alumni events.

$_________ Fund for Altgeld and Illini Halls (338168)
Support our bold plan to renovate Altgeld Hall and replace Illini Hall to create a collaborative environment for mathematics learning and discovery.

$_________ Illinois Mathematics Excellence Scholarship Fund (341016)
Scholarships enable the most promising undergraduate mathematics students to pursue their education at Illinois.

$_________ Actuarial Science Fund (330225)
Support Actuarial Science through scholarships, fellowships, graderships, and faculty support.

$_________ Mathematics Research Experience Endowment Fund (772913)
Support research experiences for undergraduate students (REUs).

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The Illinois Journal of Mathematics (IJM) is pleased to announce that it has entered into a publishing partnership with Duke University Press (DUP), beginning with Volume 63 in Spring 2019.

“We are proud to be associated with the outstanding DUP mathematics publishing program and its flagship journal, the Duke Mathematical Journal,” said Steven Bradlow, a professor in the Department of Mathematics at the University of Illinois at Urbana-Champaign and IJM editor-in-chief.

“Duke University Press is delighted to establish a partnership with the Department of Mathematics at Illinois to publish its long-established and highly regarded journal,” said Rob Dilworth, journals director at DUP. “We look forward to providing our expert mathematics publishing support to ensure that IJM continues to be a valuable resource to the entire mathematics research community.”

Editorial Board updates

IJM is pleased to welcome new Editorial Board member Professor Oscar García-Prada of the Instituto de Ciencias Matemáticas (CSIC-Madrid). Professor García-Prada’s research interests include differential geometry, complex algebraic geometry, and mathematical physics. He also serves on the editorial boards of the International Journal of Mathematics and Extracta Mathematicae.

Luchezar Avramov has retired from the Editorial Board after 15 years. Professor Avramov holds the Dale M. Jensen Chair in Mathematics at the University of Nebraska. IJM’s editor-in-chief, the Editorial Board, and staff thank Professor Avramov for his years of service to the journal.

New online submission process for IJM

As part of the transition to DUP, IJM is adopting EditFlow, an online manuscript submission and peer-review system. EditFlow is a tool specifically geared toward the needs of mathematics publishing. IJM’s EditFlow website is https://ef.msp.org/submit_new.php?jpath=illinois