MATHEMATICS + BERKELEY

Fall 2016
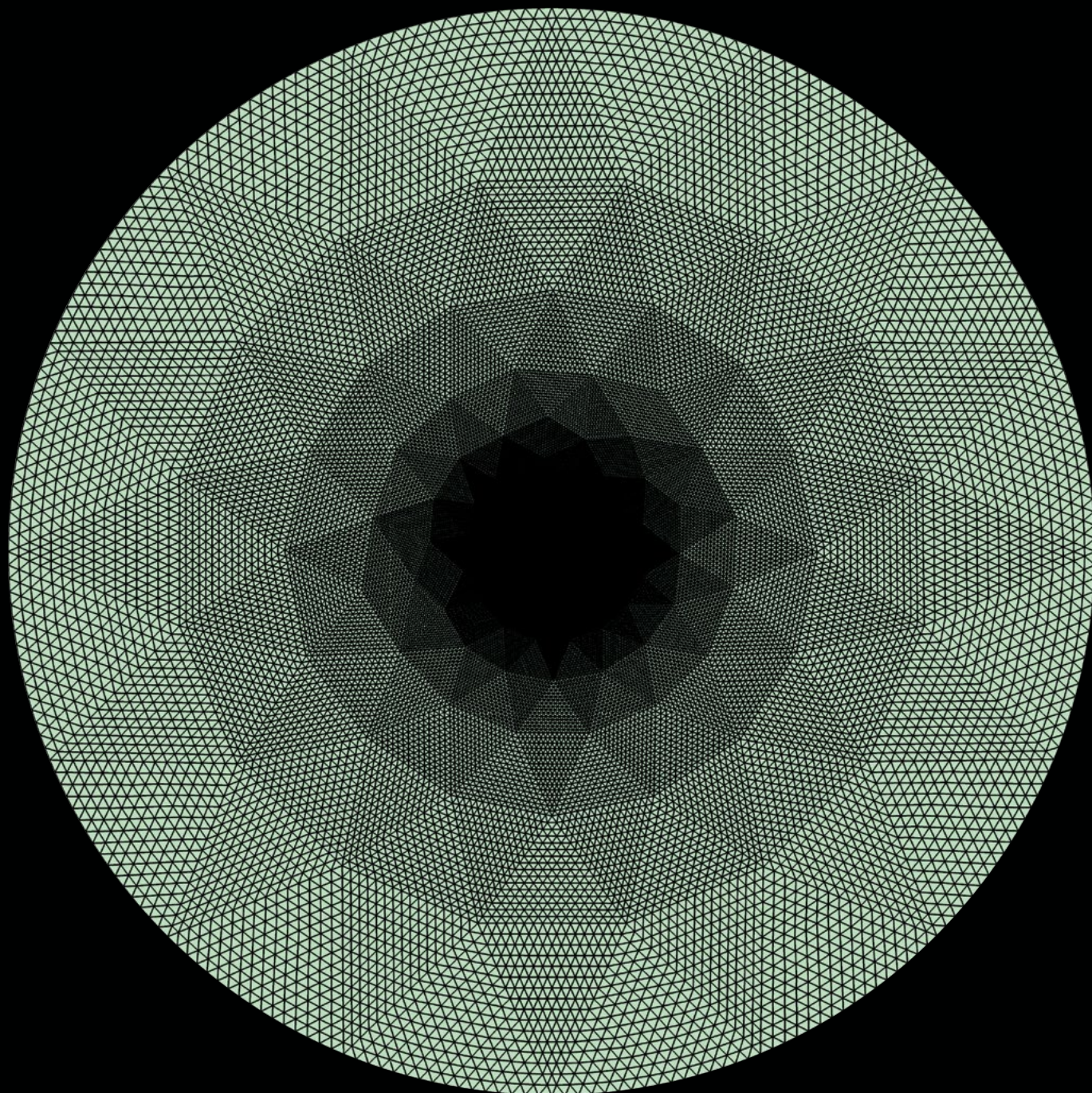
Letter from the Chair

Chair Martin Olsson (Ph.D., Berkeley, 2001) has been a member of the math faculty since 2006. His research is in algebraic and arithmetic geometry. He became Chair in Fall 2016.

Dear Friends of Berkeley Math,

Like the Berkeley campus as a whole, the math department is an extraordinarily active and vibrant community, and there is much to report on from this past year. More information about the department and the daily happenings can be found on our website math.berkeley.edu, which I encourage you to visit, but here are some highlights:

Research

Our department is one of the world's leading centers for mathematics research. We were ranked #4 in the 2015 Shanghai rankings of world universities in mathematics, and we were tied for 3rd in the most recent US News and World Report ranking of mathematics graduate programs. The faculty continue to be honored with important prizes and awards (see page 4 for some of the honors from this past year). For example, thirteen of our faculty are now members of the National Academy of Sciences. The research in the department is invigorated by numerous special events throughout the year, including the Chern, Bowen, DiPerna, and Tarski lecture series, as well as the Serge Lang Undergraduate Lecture. In addition, as in past years, we hosted several research conferences and workshops. We also benefit from our close ties with the Mathematical Sciences Research Institute, the Simons Institute for the Theory of Computing, Lawrence Berkeley National Laboratory, and the Miller Institute for Basic Research.

Undergraduates

Interest in mathematics among undergraduates remains very high. This past year we saw a record number of majors, reaching a peak of 702 in Spring 2016, and a record number of enrollments, almost 18,000. Many of our courses, including both upper division and graduate courses, have large numbers of students from other departments. Some of our students go on to ca-

Vice Chairs Thomas Scanlon, Jon Wilkening and Olga Holtz

reers in mathematics, but most take the skills learned in our courses and apply them in other careers. In order to prepare our students for their various paths, we continue to explore ways to update our curriculum to reflect the changing landscape of undergraduate math education.

Faculty

We are delighted to welcome two new faculty members to our ranks this year: Pierre Simon and Zvezdelina Stankova. Their profiles can be found on page 7. We are also fortunate to have large numbers of postdocs and visitors to the department. They contribute greatly to both our research and teaching missions.

Thanks

I took over as chair of the department this past summer. I want to take this opportunity to express my gratitude for the service performed by Craig Evans in his role as interim chair last year. I also want to thank the current department vice chairs Tom Scanlon (faculty), Olga Holtz (undergraduates), and Jon Wilkening (graduate students), as well as equity advisor Fraydoun Rezakhanlou.

Additionally, I would like to thank the department staff who do extraordinary work. Their skill and dedication enable the faculty and students to focus on our teaching and research.

Finally, thank you to those of you who have supported our department in the past, and those who are considering a donation this year. With continuing cuts in state and federal support, your support helps us maintain our excellence and standing as the top mathematics department at a public university.
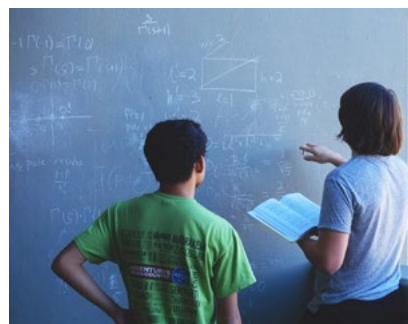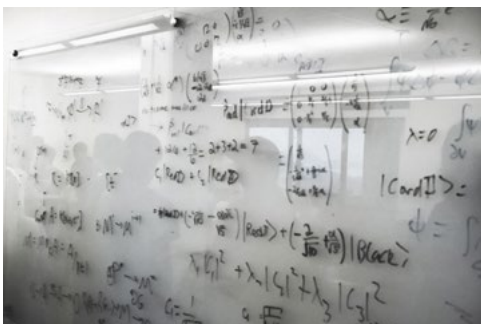
Photos: Alex Carney

Kaavya Valiveti awarded University Medal

We are proud to report that one of our graduating seniors, Kaavya Valiveti, won the coveted 2016 University Medal. During her time at Berkeley, Kaavya was known as a friend to many students and faculty, often helping others understand complex material in her clear and concise ways in Evans Hall. Her natural teaching abilities and passion for education were also put to use while volunteering at an after-school literacy program for Latino students and when raising money to improve an underfunded rural elementary school in India. In addition to her impressive academic achievements and public service, she also plays the cello and harmonium. Now a graduate student at MIT, Kaavya Valiveti was also awarded a Norman Levinson Fellowship.

Kaavya got her start in Math in Professor Jenny Harrison's H110 class before going on to excel in numerous graduate courses, eventually earning a 3.99 GPA. Of Kaavya's early days in the department, Professor Harrison wrote, "At first she was quiet, uncertain of whether she wanted to take any advanced math courses since her intended major was engineering as her brother before her. But the elegant structures found in advanced linear algebra and category theory woke her up to the beautiful potential of mathematics. By the end of the course, she had such command of the material that everyone wanted to hear what she had to say.

"Kaavya got involved in a question I asked the class and was not sure about the answer. We were studying the real Jordan form [a particular representation of a linear operator] and I challenged students to describe the canonical asymptotic behavior of these matrices acting on 2-vectors. Several students were drawn to this question and began to debate it, but only Kaavya came up with the correct solution. She told me she was riding on a train and the answer just dropped into place. It was one of those moments one never forgets. We then got into intriguing discussions with Storm Weiner about implications for particle physics. This

Kaavya Valiveti is Berkeley's top graduating senior in 2016 (Photo: UC Berkeley / Anne Brice)

was her first experience with research, and she loved it."

Using her imagination to solve complex problems is not new for Kaavya Valiveti. In her commencement address at Cal Memorial Stadium in May 2016, Kaavya described how Berkeley redirected and reignited her childhood creativity:

"When I was a child, my brother and I spent our summers writing stories with our friends about a crime-fighting hippopotamus. We concocted intricate scenarios within elaborate universes, and spent hours illustrating these scenes…and even recorded an original soundtrack in our garage. As most children do, we enjoyed a deep sense of conviction and complete faith in our imagination.

"As the years passed, however, we confronted a world that constantly tried to make us feel like our abilities and ideas are limited, that we must fit into a predetermined mold, and that some things were beyond our reach…I became more cautious and felt the youthful abandon fade away that had brought our hippo and his adventures to life.

"But when I came to Berkeley four years ago, I found a community that — in its essence — defied the cynicism and pessimism I had come to expect. I found people who freely ignored conventions, consistently challenged what was possible, and fought fearlessly for the causes they believed in. I found a professor [Jenny Harrison] who helped me feel — even as a woman — that I truly belong in the field of math, and who has inspired me to pursue the subject. And I found a place to become once again that child who wrote fantastic stories; only now, instead of the elaborate universes we created, I lived in abstract mathematical spaces.

Berkeley had slowly restored my childlike daring to have the biggest, wildest dreams and the sense that my ideas and opinions had value."

The University Medal

The University Medal was established in 1871 by Henry Huntly Haight, Governor of California and other friends of the university. The medal, along with $2,500, is awarded annually to the most distinguished graduating senior on the UC Berkeley campus. Only four mathematicians have been awarded this medal: Thomas McCready (1962), Rufus Bowen (1967), Adrian Down (2007) and Kaavya Valiveti (2016).

DEPARTMENT NEWS

Distinguished Lectures

- The 2015-16 Serge Lang Undergraduate Lecture was given on December 2nd, 2015 by Brian Conrad of Stanford University, on "The ABC Conjecture." The 2016-17 Serge Lang Undergraduate Lecture was given on September 22nd, 2016 by Ravi Vakil of Stanford University, on "The Mathematics of Doodling."

- The 2015-16 DiPerna Lecture was given on February 18th, 2016 by Gilles Lebeau of the University of Nice, on "Strichartz Inequalities". The 2016-2017 DiPerna Lecture will be given by Herbert Koch of University of Bonn.

- The 2016 Alfred Tarski Lectures were given by William Tait of the University of Chicago. The series of three lectures, given on April 4th, 6th and 8th, were entitled "On Skepticism about the Ideal", "Cut Elimination for Subsystems of Second Order Number Theory: The Predicative Case" and "Cut-Elimination for $\prod_1^1$ with the ω-Rule – and Beyond."

- The 2015-16 Chern Lectures were given on March 15–17th, 2016 by Alex Eskin of the University of Chicago, on "Dynamics on Moduli Spaces". The 2016-2017 Chern Lectures will be given by Sergiu Klainerman of Princeton University, on January 31st–February 3rd, 2017.

- The 2016-2017 Bowen Lectures will be given by Michael Harris of Columbia University.

Faculty Honors

- Professors Ian Agol and Steve Evans were elected to the National Academy of Sciences.

- Professor Mina Aganagic was selected as 2016 Simons Investigator in Physics.

- Professors Mina Aganagic and David Nadler received Miller Professorship Awards for 2016-2017, and Professor Maciej Zworski became a Miller Research Professor in Fall 2015.

- Professor Denis Auroux received the Fall 2016 Eilenberg

2016 Commencement

The Department of Mathematics' 2016 Commencement Ceremony took place on May 20th in Zellerbach Auditorium. This year's commencement speaker was Chancellor Emeritus and Distinguished Professor Robert J. Birgeneau. The ceremony saw 265 mathematics and applied mathematics majors receive undergraduate degrees, while 34 graduate students received Masters and Ph.D.'s; a number of departmental prizes (both graduate and undergraduate) were also awarded during the ceremony.

Professor Robert J. Birgeneau (Photo: GradImages)

Visiting Chair at Columbia University.

- Professor James Demmel became a 2015 Fellow of the American Association for the Advancement of Science (AAAS).

- Professors Michael Hutchings and Bernd Sturmfels received 2016 Simons Fellowships in Mathematics.

- Professor Kenneth Ribet was elected as President of the American Mathematical Society.

- Professor James Sethian was selected to present the 2017 Martin Meyerson Berkeley Faculty Research Lecture.

- Assistant Professor Nikhil Srivastava received a 2016 Sloan Research Fellowship.

- Professor Chris Shannon was reappointed to the Steiny Chair in Economics for 2015-2020.

- Professor Bernd Sturmfels became a SIAM fellow.

- Professor Daniel Tataru was awarded a Humboldt Research Award in 2016.

The Carle Johnson fund

Carle Johnson during his service in the Navy.

The Department of Mathematics is very grateful to have received a generous bequest from alum Virginia Johnson, who graduated with an undergraduate degree in Mathematics in 1943 and a graduate degree in Education in 1944. The bequest made in memory of her brother, Carle Johnson, establishes fellowships for graduate students, with a preference for women who are acquiring an advanced Mathematics degree.

Graduate fellowships provide crucial and lasting support for students doing groundbreaking research. These funds aid in recruitment by creating highly competitive offers to attract the best students, and ensure that those who come to UC Berkeley are able to research and study without additional financial worries.

Virginia Johnson teaching Mathematics after earning her degrees from Berkeley.

GRADUATE PROGRAM NEWS

Our graduate program remains one of the top-rated graduate programs worldwide (in the most recent U.S. News and World Report ranking of math graduate programs we tied for 3rd place), and *the* top graduate program among public universities in the United States. The excellence, energy, and creativity of our graduate students continue to be key success factors for the department in research and teaching. This past year we welcomed 41 new students to our Ph.D. program, 17 of whom were international students. This cohort was selected from an extraordinarily talented group of applicants, and includes some of the most promising young mathematicians in the country and worldwide. Last year we awarded 27 Ph.D.'s and 7 Masters degrees. Many of these degree recipients went on to academic postdoctoral positions in mathematics, including prestigious positions at many of the top institutions around the world. We also saw several of our graduate students take their mathematical skills into industry positions. Our graduate students have won numerous awards and fellowships; several of them were also honored with departmental prizes at last year's commencement ceremony.

Professor Jon Wilkening, Vice Chair for Graduate Affairs

Graduate Student Honors

- **Will Johnson** received the 2015-16 Herb Alexander Prize, awarded for an outstanding dissertation in pure mathematics.

- The 2015-16 Bernard Friedman Memorial Prize in Applied Mathematics was awarded to **Elina Robeva.**

- **Olya Mandelshtam** and **Aaron Mazel-Gee** received the Kenneth Ribet & Lisa Goldberg Award in Algebra.

- **Peyam Tabrizian** was awarded the 2015-16 Nikki Kose Memorial Teaching Prize.

- **Maryam Farahmand Asil, Ravi Fernando, Rockford Foster, Eric Hallman, Andrew Hanlon, Matthew Heid, Derek Hollowood, Joe Kileel, Aaron Mazel-Gee, Christopher R. Miller, Anh-Trang Nguyen, Kevin William O'Neill, Samuel Nicholas Ramsey, Elina Robeva, Anna Zarkh, Mengyuan Zhang,** and **Alexander Zorn** received 2015-2016 Outstanding Graduate Student Instructor Awards.

- Recent Ph.D.'s **Maria Gillespie** and **Noah Schweber** were awarded NSF Postdoctoral Research Fellowships.

GRADUATE STUDENT PROFILES

Maryam Farahmand is a fifth year Ph.D. student working under the supervision of Professor Matthias Beck (SFSU) and Professor Mark Haiman (UCB). Maryam received her B.Sc./M.Sc. in pure mathematics from University of Tehran, Iran, and a Masters degree in applied mathematics from Northeastern University in Boston, MA.

Maryam's research area lies in the intersection of algebraic combinatorics and polyhedral geometry. She applies the method of lattice points enumeration in polyhedra to investigate properties of q rational Catalan numbers and also the generating function of q Eulerian polynomials.

In 2016, Maryam received an Outstanding Graduate Student Instructor Award and a Lehmer's Fellowship in Number Theory.

Christopher Wong recently earned his Ph.D. under the supervision of John Strain. He was born and raised right here in Berkeley, CA, and attended Caltech as an undergrad.

Christopher's area of research is numerical analysis. His thesis work was related to quadrature rules, which can be used to efficiently and accurately discretize both differential and integral equations. Support from a Simons Fellowship allowed him to finish his dissertation in a timely manner.

Christopher is currently a postdoctoral researcher at Rice University. He is now interested in developing structured matrix solvers for oscillatory integral equations, which are important for modeling high-frequency phenomena in physical sciences.

Qiao Zhou is a fifth year Ph.D. student working under the supervision of David Nadler. She grew up in China, went to Singapore for high school, and obtained her undergraduate degree from University of Toronto, Canada.

Qiao's research lies in the area of geometric and combinatorial representation theory, which is closely related to algebraic geometry and number theory. More specifically, she uses objects like convex polytopes in toric geometry to understand local models of Shimura varieties in number theory.

Thanks to generous contributions from our donors, Qiao was supported in Spring 2015 by a Fellowship, which allowed her to focus on her Ph.D. thesis and visit experts at other institutions.

Congratulations to our students who received their Ph.D.'s this past academic year!

Chang-Yeon Cho, *"Topological types of Algebraic stacks,"* under Martin Olsson. Chang-Yeon is now a Postdoctoral Researcher at the Center for Geometry and Physics at the Institute for Basic Science.

Woo-Hyun Cook, *"Transformations of PDEs: Optimal Transport and Conservation Laws,"* under Craig Evans.

Jed Duersch, *"High Efficiency Spectral Analysis and BLAS-3 Randomized QRCP with Low-Rank Approximations,"* under Ming Gu. Jed is now a Software Engineer at Cray Inc.

Meire Fortunato, *"Curved and anisotropic unstructured mesh generation and adaptivity using the Winslow equations,"* under Per-Olof Persson. Meire is now a Research Scientist at Google DeepMind.

Oran Gannot, *"Quasinormal modes of anti-de Sitter black holes,"* under Maciej Zworski. Oran is now an RTG postdoc at Northwestern University.

Maria Monks Gillespie, *"A combinatorial approach to the q,t-symmetry in Macdonald polynomials,"* under Mark Haiman. Maria is now an NSF postdoc at UC Davis.

Daniel Greengard, *"Complex Boundary Integral Equation Formulation and Stability Analysis of a Maxwell Model and of an Elastic Model of Solid-Solid Phase Transformations,"* under Jon Wilkening.

William Johnson, *"Fun with Fields,"* under Thomas Scanlon. William is now a Software Engineer at Niantic Labs, Inc.

Jakub Kominiarczuk, *"Acyclic Monte Carlo: Efficient multi-level sampling of undirected graphical models through fast marginalization,"* under Alexandre Chorin.

Christoph Kroener, *"A Mathematical Exploration of a PDE System for Lithium-Ion Batteries,"* under Craig Evans.

Alex Kruckman, *"Infinitary Limits of Finite Structures,"* under Thomas Scanlon. Alex is now a Zorn Postdoctoral Fellow at Indiana University.

Minjae Lee, *"Spectral Analysis on Point Interactions,"* under Maciej Zworski. Minjae is now a data scientist at Samsung Insurance.

Penghui Li, *"Uniformization of semistable bundles on elliptic curves,"* under David Nadler. Penghui is now a Postdoctoral Researcher at IST Austria.

Anna Lieb, *"Modeling and optimization of transients in water distribution networks with intermittent supply,"* under Jon Wilkening and Chris H Rycroft. Anna is now a Data Scientist/Consultant at McKinsey & Co.

Weihua Liu, *"Noncommutative Distributional Symmetries and Their Related de Finetti Type Theorems,"* under Dan-Virgil Voiculescu. Weihua is now a Zorn Postdoctoral Fellow at Indiana University Bloomington.

Olya Mandelshtam, *"Combinatorics of the Asymmetric Simple Exclusion Process,"* under Lauren Williams. Olya is now a UC President's Postdoctoral Fellow at UCLA, and will spend the next 3 years as a Tamarkin Assistant Professor at Brown University.

Aaron Mazel-Gee, *"Goerss-Hopkins obstruction theory via model ∞-categories,"* under Peter Teichner. Aaron is now a Zassenhaus Assistant Professor at Ohio State University.

Benjamin McMillan, *"Geometry and Conservation Laws for a Class of Second-Order Parabolic Equations,"* under Robert Bryant. Benjamin is now a Research Assistant Professor at the Simons Center for Geometry and Physics at Stony Brook University.

Elina Robeva, *"Decomposing Matrices, Tensors, and Images,"* under Bernd Sturmfels. Elina is now an Instructor at MIT.

Noah Schweber, *"Interactions between computability theory and set theory,"* under Antonio Montalban. Noah is now an NSF postdoc at the University of Wisconsin-Madison.

Jacob Scott, *"An I/O-Complexity Lower Bound for All Recursive Matrix Multiplication Algorithms by Path-Routing,"* under Olga Holtz.

Alexander Shapiro, *"Grothendieck resolution, affine Grassmannian, and Yangian,"* under Nicolai Reshetikhin. Alexander is now a Postdoctoral Fellow at University of Toronto.
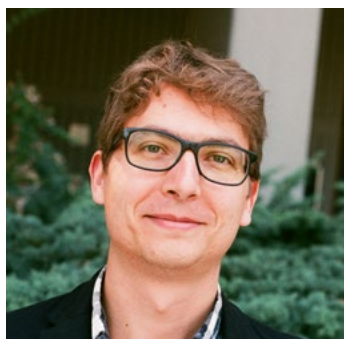
Peyam Tabrizian, *"Asymptotic PDE Models for Chemical Reactions and Diffusions,"* under Craig Evans. Peyam is now a Visiting Assistant Professor at Williams College.

Christopher Wong, *"Bilinear Quadratures and Their Application,"* under John Strain. Christopher is now a Postdoctoral Researcher at Rice University.

Undergraduate Honors

- Class of 2016 Valedictorian **Kaavya Valiveti** was the winner of the 2016 University Medal, was awarded the 2015-2016 Departmental Citation, and received an Honorable Mention for the 2016 Alice T. Schafer Prize for Excellence in Mathematics.

- **Kevin Chen, Derek Leung, Kiran de Souza Luecke, Patrick Lutz, Nishant Pappireddi, Stephen Sheng, Kaavya Valiveti,** and **Dolores Walton** were awarded the Dorothea Klumpke Roberts Prize in Mathematics in recognition of their truly exceptional scholarship.

- **Franchesca Cavagnaro, Yizhuang Alden Cheng, Hanif Joey Cheung, Eric Severson, Nopphon Siranart,** and **Nathanan Tantivasadakarn** were awarded the Percy Lionel Davis Award for Excellence in Scholarship in Mathematics.

- **Lewis Chen, Donovan Lieu, Clark Lyons,** and **Henry Maltby** earned Honorable Mention honors in the 2015 William Lowell Putnam Mathematical Competition.

Entering class of graduate students 2016 (Photo: Vicky Lee)

New Faculty

Pierre Simon

Assistant Professor Pierre Simon was appointed to our department this year. Simon works in model theory. His research so far has focused on a combinatorial tameness condition known in machine learning theory as finite VC-dimension. In model theory, this property is called NIP and provides a combinatorial approach to semi-algebraic geometry over real or valued fields. As such, it has links with combinatorics and rigid geometry. Simon obtained his Ph.D. from Université Paris-Sud Orsay in 2011, after which he was a postdoc at the Hebrew University, Jerusalem. He then held a CNRS position in Lyon before coming to Berkeley. In 2012, he was awarded the Sacks prize for the best dissertation in mathematical logic of the year.

Zvezdelina Stankova

Teaching Professor of Mathematics Zvezdelina Stankova (Zvezda) joined our department full-time this year, although she has previously taught multiple courses here since 2002. She received her Ph.D. from Harvard University in 1997, and also has high school teaching certificates in Massachusetts and California. As a postdoctoral fellow at MSRI and UC Berkeley in 1997-1999, Stankova co-founded the Bay Area Mathematical Olympiad and created the Berkeley Math Circle (BMC). She has earned a number of awards, including the Alice T. Schafer Prize for Excellence in Mathematics, the Henry L. Alder Award for Distinguished Teaching and the Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teachers.

New Morrey Visiting Assistant Professors

Marina Iliopoulou (Harmonic Analysis, incidence geometry, geometric measure theory), Ph.D. Edinburgh, 2013.

Ludovic Patey (Mathematical logic, computability theory), Ph.D. Paris VII 2016.

Insuk Seo (Interacting particle systems), Ph.D. Courant Institute (NYU) 2016.

Andrey Smirnov (Algebraic geometry, representation theory, integrable systems), Ph.D. Columbia University 2016.

New Postdocs

James Conway (Low Dimensional Topology), Ph.D. Georgia Tech 2016, RTG Visiting Assistant Professor.

Anil Damle (Algorithms), Ph.D. Stanford University 2016, NSF Postdoc.

Casey Jao (Harmonic Analysis, PDE), Ph.D. UCLA 2016, NSF Postdoc.

Weile Jia (ELSI project research), Ph.D. Chinese Academy of Sciences 2016.

Michele Schiavina (Algebraic geometry/topology, applied mathematics), Ph.D. University of Zurich 2016, Swiss NSF Postdoc.

Michael Viscardi (Gauge theory, mirror symmetry), Ph.D. MIT 2016.

Staff news

There were two departures among our staff last year. Sarah Lirio accepted a position with the Department of Economics and left Research Administration in February 2016.

Barb Waller retired in July after working 10 years as Math's Graduate Advisor and a total of 38 years of UC service.

Ana Renteria joined Math as a temporary Undergraduate Advisor in January and accepted the career position in May. Ana has a BA in Social Welfare from UC Berkeley. Jessie Sanchez joined Research Administration in February. Vicky Lee was hired as our Graduate Advisor and Program Coordinator in July. Vicky formerly worked for the Department of Economics. She has a Master's in Human Development & Psychology from Harvard and a BA in Psychology from UC Berkeley.

In February, Jennifer Sixt was promoted to Student Services Supervisor. In April, Heather Read's position was reclassified upward to Financial Analyst 3.

Facilities

The Math Department Summer 2016 projects included the installation of new gliding blackboards in 891 Evans, new AV projectors in 740 Evans and 939 Evans, and new security cameras on the 9th floor of Evans. Electronic locks have been installed at all Evans building entrances. These locks are on timers, which are programmed to the building hours to improve building security. Security cameras have also been installed on the ground floor, first floor and loading dock of Evans. Footage can be reviewed with UCPD to follow up on thefts or suspicious activity. The Evans first floor restrooms have been renovated and converted to Gender Neutral Restrooms. The Evans south elevator construction project is a work in progress to meet current accessibility requirements and codes. Elevator # 1 is back in service. Elevator # 2 is scheduled for completion on 11/18/16. Elevator # 3 is scheduled for completion on 2/7/17.

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Berkeley is built by many, including **you**.

Many Cal alumni show their support by making a gift of real estate. This gift can include all or a portion of the property, and can be an outright gift to the Department of Mathematics or as part of a charitable trust that pays income for life. Your gift will support the initiatives you designate.

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A Note on Strategic Priorities

The Department of Mathematics is working hard to maintain its excellence in all aspects of research and education and to bridge the resource gap that separates us from our better-funded peers. For this we continue to rely crucially on donations from alumni and friends of the Department. Here are some of the department's current top priorities:

• **Graduate Student Fellowships** are vitally needed to enable the department to make competitive, attractive offers to the very strongest applicants to our graduate program, who are otherwise often lured by our private peers with offers of higher stipends and lower teaching loads.

• **Endowed Faculty Chairs** are needed in order to improve the department's ability to make competitive offers for the recruitment and retention of world-class faculty.

• **Research Visitor Funds** make it easier to invite high-profile visitors to visit Berkeley to deliver lectures in our department or collaborate with our faculty. These intellectual exchanges are of tremendous value to our research and education.

Besides these specific goals, we welcome gifts to the department's discretionary fund, which give the Chair of the Department much-needed flexibility in funding graduate student recruitment, parts of the faculty recruitment process, research travel for graduate students, and many other initiatives that make our program competitive and rewarding.

We invite you to join us in keeping UC Berkeley Mathematics strong through your gifts to the department. All donations, large or small, are greatly valued. You may choose whether to direct your gift toward a specific goal of your choice or to have your donation used for our most pressing needs at the department's discretion.

For further information, please contact Nicholas Cole, e-mail: ncole@berkeley.edu, Maria Hjelm, e-mail: mhjelm@berkeley.edu, or Prof. Martin Olsson, e-mail: chair@math.berkeley.edu

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The Department of Mathematics wishes to thank all alumni, parents, students, faculty, staff and friends who support the Department.

You may return this form to:

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   In addition, (company name) _____ will match my gift.
   The company matching gift form   ❑ is enclosed   ❑ will be mailed

❑ Please direct my gift to the Department of Mathematics Annual Fund, to be used for the Department's greatest need at the Chair's discretion.

❑ I prefer to designate my gift for undergraduate scholarships.

❑ I prefer to designate my gift for graduate student fellowships.

❑ I prefer to designate my gift for (other) _____

❑ Send me information on charitable estate and gift planning or on establishing an endowment.

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