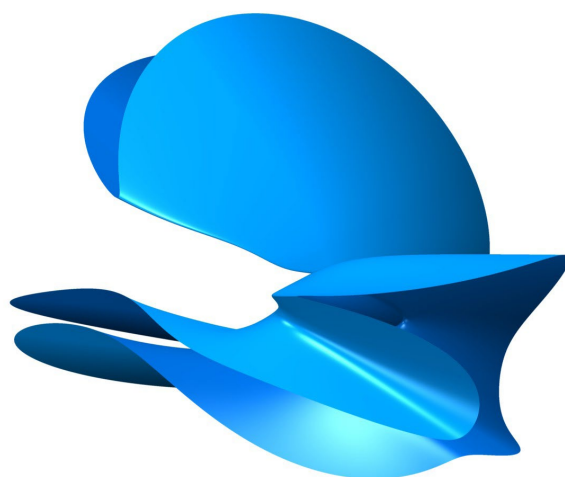
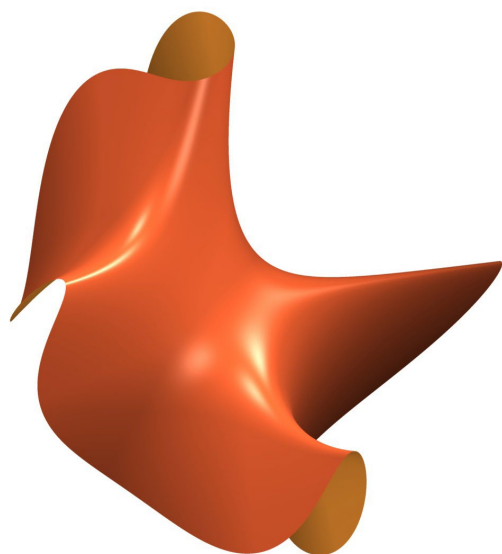
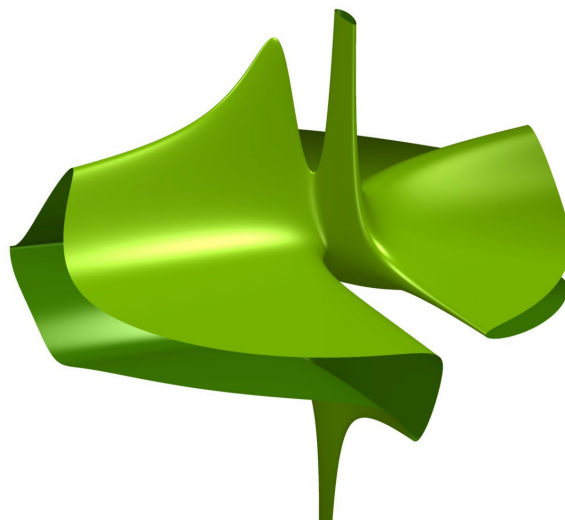
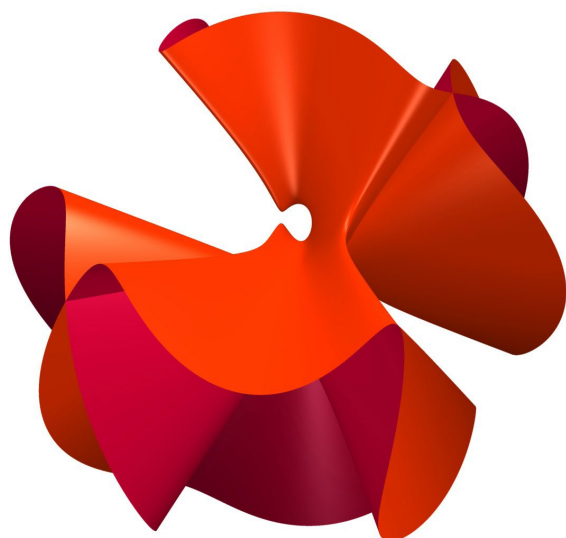


MATHEMATICS + BERKELEY

Fall 2020



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Chair Michael Hutchings (PhD, Harvard, 1998) has been a member of the math faculty since 2001. His research is in low dimensional and symplectic geometry and topology. He became Chair in Fall 2019.

Dear Friends of Berkeley Math,

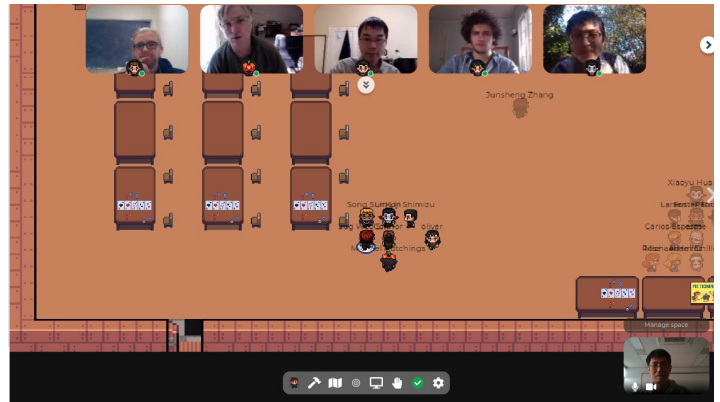
Due to Covid-19, this last year has been quite extraordinary for almost everyone. I have been deeply moved by the enormous efforts of members of our department to make the most of the circumstances and continue our excellence in teaching and research.

We switched to remote teaching in March with just two days of preparation time, and for the most part will be teaching remotely at least through Spring 2021. As anyone who teaches can probably tell you, teaching online is no easier than teaching in person, and often much more difficult. However, developing online courses has also given us an opportunity to rethink how we can teach and interact with students. Five of our introductory classes participated in Berkeley's Fall "Semester in the Cloud" program of enhanced online courses. Alex Paulin and Kelli Talaska developed the "Precalculus Essentials" online modules to help prepare incoming students and improve access to our offerings. These online materials will be valuable assets even after in-person teaching resumes.

In mathematics we are lucky that we are not dependent on research labs and can continue our research at home - even if it may be at the kitchen table with children wrestling nearby. While it seems that nothing can replace the magic of figuring out math together in person, at the same time one can now quickly pop in to a seminar on another continent - if one does not mind odd hours sometimes - and it is easy to invite research visitors virtually to our department. The Pacific Rim Conference in Mathematics which we hosted virtually in August was a great success, and more easily accessible than it would have been in person. Who knows how mathematics research will have changed once in-person meetings are possible again.

Meanwhile, our distinguished faculty continue to receive prestigious honors for their work. To list a few examples: Suncica Canic and Michael Christ were elected Fellows of the American Mathematical Society. SungJin Oh was awarded a Sloan Research Fellowship and an NSF CAREER grant. Alex Paulin won a 2020 campus-wide Distinguished Teaching Award. Song Sun won a New Horizons in Mathematics Prize from the Breakthrough Prize Board. Daniel Tataru was elected a Fellow the European Academy of Sciences.

We were fortunate to recruit three outstanding new faculty. Alex Paulin, who was previously here as a Lecturer, has



The department's weekly afternoon tea in virtual 1035 Evans Hall on [gather.town](#). Some attendees are dressed as vampires and pumpkins, others are playing pictictionary.

rejoined the department as an Assistant Teaching Professor. Yingzhou Li, who works in Applied Mathematics, and Ruixiang Zhang, who works in Analysis, will join the department as Assistant Professors in Spring and Fall 2021, respectively.

And we need to grow our faculty further, in order to meet very high teaching demand. In Spring 2020 we had over 900 mathematics majors, and we awarded a record 458 undergraduate degrees in pure and applied mathematics. Total enrollment in our courses for the year 2019-20 (the sum over all math courses of the number of students in the course) was nearly 19,000. This includes a record summer enrollment of over 2,000 students in summer 2020.

Our world-class graduate program was once again ranked in a tie for second place by US News & World Report. This year we recruited a diverse incoming class of 29 graduate students, 10 of whom are international. We welcomed them over the summer through a series of online departmental "happy hour" meetings.

As always, our department could not function without the tireless dedication of the staff. We were lucky to hire a new Department Manager, Brian Underwood, in February, just in time to steadily navigate the department through unusual times.

In other news, planning is underway to move our department to a new building to be constructed on the North Field site (actually on the south side of campus), tentatively to open in 2025.

I encourage you to stay connected with the department and with Berkeley. You can learn more about the many activities in the department on [our homepage](#) and the [UC Berkeley Mathematics Facebook page](#), and you can join current and former students in the [UC Berkeley Mathematics LinkedIn group](#).



Vice Chairs: Thomas Scanlon (Equity Advisor), Constantin Teleman (Faculty Affairs), Sug Woo Shin (Graduate Affairs), Per-Olof Persson (Undergraduate Affairs)

Happy Hours on Zoom

Lonely creatures as we mathematicians are, compared to our endlessly chatty academic colleagues, the “grounding” in this year’s pandemic might have been expected to affect us less. In some ways this was true, with online instruction and seminar talks continuing successfully, and Zoom proving an adequate venue for meetings. In fact, the transmutation of research seminars into cyberspace events had the beneficial consequence of increasing access (if sometimes at the cost of turning some of us into zombies), but in practical ways our professional lives may have been less impaired than those of colleagues in other fields.

One exception concerned the intellectual life of graduate students, especially first-years, who may have only partially settled in, and the entering class, deprived of the live interaction and mingling with their senior colleagues and faculty, which would spontaneously lead to study and reading groups. On top of that, the lack of contact could affect their most important decision, that of choosing an advisor.

I don’t recall how the idea of happy hour faculty lectures first arose at a late Spring meeting; the IAS pioneered the practice with Wednesday evening talks, but the aim here was different, to provide a venue for the faculty to introduce themselves and their work to the young ‘uns. I remember some anxiety when undertaking to organize this (and worked on securing the moral support of some colleagues), dreading the experience of leaning on my colleagues to speak, or perhaps resort to extortion tactics.

These fears were unfounded, and all speaking slots were booked within a day; we even stretched the timeline, making the talks merge into our weekly colloquium offerings. Isolation had taken such a toll on us that offering a seminar lecture had become irresistible. So did listening to one, judging by the high and steady attendance. The series ended with start of term, but there is a strong desire to make it into a permanent offering — perhaps as soon as life returns to some normalcy and the schedule stabilizes.

All speakers stepped up to the task of showcasing their work and interest; it was in many cases a revelation for us in the

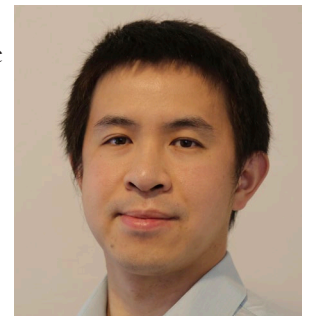
faculty to hear what our colleagues were working on. We heard lectures on Hamiltonian dynamics, combinatorics of plane curve arrangements, distribution of zeroes of polynomials, how topology reconstructs algebraic varieties, spectral theory and superconduction in graphene, definability and arithmetic (a great introduction to this fall’s MSRI program), and quantum supremacy (or when the robots will replace us, at least teaching linear algebra).

The lectures were bracketed by Zoom Room discussions on topics of concern to our students and postdocs. The only flop was my ‘Parlor games’ Zoom room in the first meeting; I am still looking for company to play ‘Dictionary’.

(Prof. Constantin Teleman)

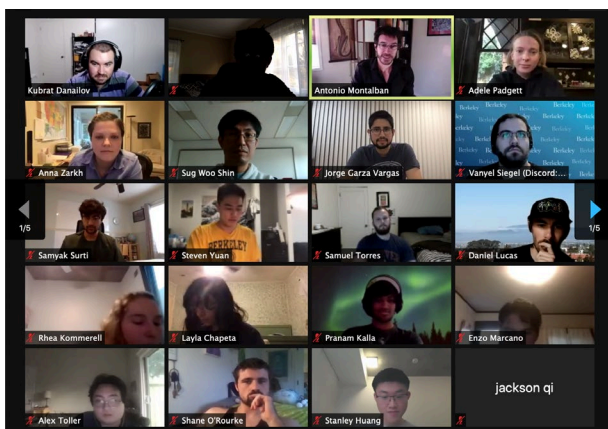
Song Sun wins New Horizons Prize

Associate Professor Song Sun was awarded the 2021 New Horizons Prize along with Bhargav Bhatt and Alexander Logunov. The prize recognizes early career mathematicians who have already made a substantial impact on their fields and comes with an endowment of \$100,000 to each winner.



Sun’s research is concerned with complex differential geometry. Differential geometry is a topic studying geometric shapes via differential calculus. Complex geometry deals with complex manifolds—spaces that admit infinitesimal multiplication by the imaginary number i , which include as examples the solution set of polynomial equations over the complex numbers. The images on the cover are another example, known as Fano manifolds. There is a long tradition of investigating geometric objects on complex manifolds governed by differential equations. Sometimes this interaction generates deep connections with other subjects.

One manifestation is the study of the so-called Kähler-Einstein metrics. These are structures on complex manifolds that satisfy an analogue of Einstein’s equation in general relativity, and they also play important roles in high energy theoretical physics. Not every compact complex manifold admits such metrics. The famous work of S-T. Yau in the 1970s on the Calabi conjecture gave a definitive existence criterion in the case of negative and zero Einstein constant. The case of positive Einstein constant has been a mystery until recently. In joint work with Xiuxiong Chen and Sir Simon Donaldson in 2012-2013, Sun established a characterization of the existence of Kähler-Einstein metrics with positive Einstein constant in terms of the notion of K-stability in algebraic geometry. This proved a longstanding conjecture that goes back to S-T. Yau. In the meantime, with collaborators, Sun also made further contributions to the understanding of singularity formations and moduli spaces of these metrics. These results built foundational bridges relating geometric analysis and algebraic geometry, and opened up many new research directions.



The Berkeley Connect panel on Graduate School, held on Zoom.

DEPARTMENT NEWS

Faculty Honors

- Professor **Mina Aganagic** gave the 2020 UCLA Distinguished Lecture Series.
- Professor **Ian Agol** received the Distinguished Alumni Award from Caltech.
- Professors **Michael Christ** and **Suncica Canic** were named fellows of the AMS.
- Professor **David Eisenbud** received the 2020 AMS Award for Distinguished Public Service.
- Assistant Professor **Sung-jin Oh** received a Sloan Research Fellowship.
- Assistant Teaching Professor **Alex Paulin** received the University's 2020 Distinguished Teaching Award.
- Associate Professor **Pierre Simon** received the 2019 Shoenfield Prize of the Association for Symbolic Logic for expository writing in the book category. Professor **John Steel** received the same prize in the article category.
- Associate Professor **Song Sun** was awarded the 2021 New Horizons Prize in Mathematics (article on page 3).
- Professor **Daniel Tataru** was elected to the European Academy of Sciences.

2020 Virtual Commencement

Due to the pandemic, the 2020 Mathematics commencement (and more generally the university commencement) took place virtually. Visit <https://math.berkeley.edu/about/events/commencement> for an online celebration of our students' achievements.

Photo: 2020 Blockley Graduation. Credit: Bjorn Lustic.



New Morrey Asst. Professors

Ivan Danilenko (enumerative geometry, geometric representation theory, low-dimensional topology), PhD Columbia.

Federico Pasqualotto (PDE, general relativity, fluid dynamics, nonlinear waves), PhD Princeton.

Christopher Ryba (representation theory, algebraic combinatorics), PhD MIT.

New NSF Postdocs

Juliette Bruce (algebraic geometry, commutative algebra, arithmetic geometry), PhD Wisconsin.

McFeely Goodman (differential geometry), PhD University of Pennsylvania.

Rachel Webb (Gromov-Witten Theory), PhD Michigan.

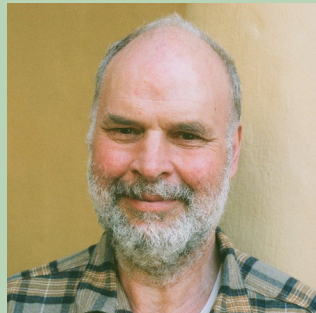
Photo: Morrey Asst. Profs left, NSF Postdocs right.



In Memoriam

Prof. Emeritus **Vaughan Jones** died on September 6, 2020 at the age of 67.

In 1982 Vaughan made amazing discoveries about subfactors. It was the beginning of subfactor theory, which has developed into what is perhaps the most successful noncommutative Galois theory. The theory deals with von Neumann algebras, which encode linear geometries of subspaces of a Hilbert space for which there is a dimension function with values in the interval $[0,1]$ and the role of the Galois group is taken by an object built from quantum symmetries. Soon after this, studying algebraic properties of these quantum symmetries, he made the stunning discovery that they led to a new invariant for knots, the celebrated Jones polynomial of a knot, which provided the tool to solve longstanding problems about knots, like several of the Tait conjectures. What had started in von Neumann algebra theory, contributed to low-dimensional topology, to the emergence of a so-called quantum topology and also to developments on mathematical models



in statistical mechanics and quantum field theory, especially conformally invariant models. In 1990 Vaughan Jones was awarded a Fields Medal at the Kyoto ICM for his work.

For about a quarter century, 1985 - 2011, Vaughan was a professor at the Berkeley Math Department and from 2011 on he moved to Vanderbilt, while becoming an emeritus at Berkeley. At commencements, Vaughan and his wife Martha and their three children, a family with a passion for music, often played in the Math Department Orchestra. Vaughan also had a passion for ski and kite-surfing which often combined with informal scientific meetings he organized.

In addition to the Fields Medal, there is a long list of honors and awards he received. He served as a Vice-President of the International Mathematical Union and also as Vice-President of the AMS, and was made in 1992 a Honorary Vice-President of the International Guild of Knot Tyers. In New Zealand, his native country, the Jones Medal created by the Royal Society of New Zealand in 2010, is named after him.

His dynamic personality and openness inspired and enriched many. It will take a long time to get used to his absence. (Prof. Dan-Virgil Voiculescu)

Memorial gifts can be made to the Vaughan and Martha Jones Graduate Student Support Fund.

UNDERGRADUATE NEWS

Undergraduate Student Honors

- **Yuhan (Michelle) Jiang** received the department citation, the Paul Chernoff Memorial Prize, and was a runner-up for the 2020 Alice T. Schafer Prize of the Association of Women Mathematicians.
- **Aidan Backus, Joseph Chen, Gurkiran Dhaliwal, Jiahao Du, Samuel Hsu, Stefan Ivanovic, James Leng,** and **Nikhil Henry Bukowski Sahoo** were awarded the Dorothea Klumpke Roberts Prize in recognition of their exceptional scholarship.
- **Elizabeth Coda, Yiming Ding, Jack Ji, Joshua Lin, Elliot Stahnke, Kimball Strong, Ren-Yi Wang,** and **Zitong Yang** won the Percy Lionel Davis Award for Excellence in Scholarship in Mathematics.
- Congratulations to the UC Berkeley team **Junhao Fan, Haydn Gwyn, Austin Lei,** and **Tyler Zhu** for earning Honorable Mention honors in the 2019 William Lowell Putnam Mathematical Competition. **Junhao Fan** and **Austin Lei** also received an honorable mention, and **Haydn Gwyn, Justin Yokota** and **Tyler Zhu** finished in the top 200 (out of 4,229 competitors).

Pre-Calculus Essentials Pilot Program

Mathematics is a critical skill set students need to succeed in a wide variety of majors. At Berkeley, about 80% of undergraduate students take a course in mathematics.

Many of these students arrive with a clear sense of what they want to study, only to find themselves unprepared and struggling through gateway math courses. This experience is often enough to deter students from pursuing scientific or technical fields. Among underrepresented students, there is a steep STEM dropout rate of around two thirds.

As instructors of lower division classes, we (Kelli Talaska and Alexander Paulin) have seen these issues up close: students with no prior exposure to trigonometry, students with only a limited grasp of basic algebra, students unfamiliar with laws of exponents and logarithms, and so on.

To help prepare incoming undergraduates, there is a clear need to identify and address gaps in their mathematical understanding. With support from the Eustace-Kwan Family Foundation, in 2017 the department implemented the use of ALEKS (Assessment and Learning in Knowledge Spaces), an online diagnostic assessment tool that identifies a student's mathematical strengths and weaknesses.

While ALEKS has been effective at identifying major gaps in mathematical knowledge, it has not been as useful as a learning tool. Its learning modules are not well suited to the needs of our undergraduates.

To address this issue, we've designed resources to better support our incoming students. The result is a new program we've called Pre-Calculus Essentials. The core materials consist of over thirty lessons with detailed videos and worksheets. These cover key topics (algebra, inequalities, functions, trigonometry) from a university-level perspective. With support

from Digital Learning Services, we've put together a comprehensive program website to make accessing these materials easy for students throughout the university.

With the support of the MPS Dean's office and the SLC, we also ran a 2020 summer course, targeting incoming undergraduates. There were two ways students could choose to engage: access the course materials purely for self-study, or request placement into a peer tutor group with meetings every week-day. Despite extremely short notice we had an overwhelming response to the program.

Over 900 students signed up to participate, with 200 taking part in the peer tutor groups. For three weeks, these groups met with their tutors daily to discuss the lesson of the day and try worksheet problems together. Engagement was very high, with attendance around 90%.

Going forward we intend to make standalone resources available more broadly throughout the university. We anticipate they'll be useful to instructors across a wide range of STEM subjects, and are working to tailor them to the needs of specific classes. Given the initial success of the summer program, we also anticipate running it again in future years.

Our hope is that providing these targeted resources to support our incoming undergraduate students will help drive improved outcomes for those participating. We look forward to seeing its impact on students' preparedness for gateway mathematics courses and STEM major retention rates.



Prof. Vojta teaches Math 115 (number theory) on Zoom from his home setup.

Update from MUSA Our goals at MUSA are to foster a strong passion for mathematics, to represent the undergraduate Math community at Cal, and to enrich our community with resources. Some of our programs include Math Mondays, where we invite faculty and graduate students to speak about their research; Math 74, a transitional course to better prepare our students for upper division math courses; and BUMP (Berkeley Undergraduate Math Mentoring Program), a mentorship program that links underclassmen with upperclassmen. Love what we're doing? Want to give back to the math community at Cal? Consider sponsoring the Mathematics Undergraduate Student Association (MUSA)! You can find more information at our website, musa.berkeley.edu. (Anthony Chen, MUSA President)

Congratulations to our students who received their PhDs this past academic year!

Chao Kusollerschariya, “Dirac Triples for Unital AF Algebras” under Marc Rieffel. Lecturer, Naresuan University, Thailand.

Alexander Rusciano, “Two Geometric Results regarding Hölder-Brascamp-Lieb Inequalities, and Two Novel Algorithms for Low-Rank Approximation” under James Demmel.

Haoran Tang, “Towards Informed Exploration for Deep Reinforcement Learning” under James Sethian and Pieter Abbeel.

Ze Xu, “Density Functional Perturbation Theory and Adaptivity”, under Lin Lin. Quantitative Researcher, Two Sigma Securities.

Alexander Bertoloni Meli, “The Local Langlands Correspondence, Rapoport-Zink Spaces, and Shimura Varieties”, under Sug Woo Shin. RTG Postdoctoral Assistant Professor, University of Michigan.

Madeline Brandt, “Tropical Geometry of Curves” under Bernd Sturmfels. NSF Postdoc & Tamarkin Assistant Prof, Brown University.

Christopher Eur, “The Geometry of Divisors on Matroids” under David Eisenbud. NSF Postdoctoral Fellow, Stanford University.

Archit Kulkarni, “Random Matrix Theory in Numerical Linear Algebra” under Nikhil Srivastava. Software Engineer, Anyscale.

Kyeongsik Nam, “Singular stochastic differential equations with elliptic and hypoelliptic diffusions” under Fraydoun Rezakhanlou. Hedrick Assistant Prof, UCLA.

Mohandas Pillai, “Global, Non-scattering Solutions to Energy Critical Geometric Wave Equations” advised by Daniel Tataru. SEW Visiting Assistant Professor, UC San Diego.

Alex Sherman, “Spherical and Symmetric Supervarieties” under Vera Serganova. Postdoctoral Fellow, Ben Gurion University.

Ben Wormleighton, “Numerics and stability for orbifolds with applications to symplectic embeddings” under David Eisenbud. Postdoctoral Research Associate, Washington University in St. Louis.

Mengyuan Zhang, “Liaison of curves and bundles” under David Eisenbud.

Yue Zhang, “Guts, Dehn Fillings and Volumes of Hyperbolic Manifolds” under Ian Agol. Quantitative Researcher, Citadel Securities.

James Walsh, PhD in Logic, “Reflection Principles and Ordinal Analysis” under Paolo

Mancosu and Antonio Montalban. Postdoc in Philosophy, Cornell University.

Graduate Student Honors

- The 2019-20 Bernard Friedman Memorial Prize in Applied Mathematics was awarded to **Milind Hegde** and **Jeffrey Kuan**.
- **Madeline Brandt** and **Chris Eur** received the Kenneth Ribet & Lisa Goldberg Award in Algebra.
- **Andy Chen, Yijia Chen, Shinu Cho, Ethan Dlugie, Sarah Firestone, Michael Franco, Jorge Garza Vargas, Frederick Huang, Jeremy Meza, Sam Mossadeghian, Kyeong Sik Nam, Alexander Paauwe, German Stefanich, Dun Tang, Xiaohan Yan, Michael Yeh, Leon Zhang, Xinyu Zhao, Ziwen Zhao, Roy Zhao, and Maksym Zubkov** received 2019-20 Outstanding Graduate Student Instructor Awards.
- 2019 PhD **Anna Seigal** received SIAM's 2020 Richard C. DiPrima Prize for early career researchers in applied mathematics.

Isabelle Shankar is a fifth year PhD student advised by Serkan Hosten. Her mathematical interests include real algebraic geometry, polynomial optimization, and combinatorics, with varying degrees of knowledge in each area. In particular, she studies problems arising in convex algebraic geometry with symmetries to exploit including certifying nonnegativity of symmetric polynomials and studying spectrahedral lifts of polytopes invariant under a group action. Outside of math she loves climbing, cooking and traveling. Getting to go to conferences all over the world is one of the reasons she became a mathematician.



She also works to support and build collaborations with the many diverse communities within mathematics. She is an organizer of The Noetherian Ring (NRing) and a member of the program committee for the first Queer and Trans Mathematicians in Combinatorics Conference. As an educator, she cares about creating an inclusive and supportive environment in the classroom and was awarded the Outstanding Graduate Student Instructor Award in 2018.

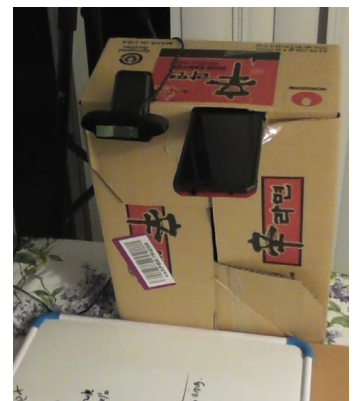
She is grateful for the support of the James H. Simons Fellowship and the UC Dissertation-Year Fellowship. This generous funding has allowed her to focus on both research and advancing diversity efforts in the math community.

“Transitioning to remote teaching and learning has been a challenge on two fronts - the technological and pedagogical. With tools like Zoom, Slack, Gradescope, Piazza and others, we have almost solved the technological setup issues. Going forward into our third semester of teaching online, we need to continuously innovate and develop proper pedagogy on top of this technology base, as our students need more support than ever in these trying times”

— Kubrat Danailov, Graduate Student

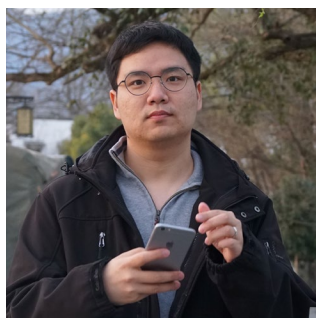
The photo is an impromptu document camera devised by Danailov to rapidly allow GSIs to continue discussion sections during the sudden transition to online teaching in March.

See his video on how to make one in ten minutes at www.linkedin.com/pulse/setting-up-remote-learning-zoom-laptop-cellphone-kubrat-danailov/



New Faculty Profiles

Alexander Paulin is joining the faculty as an Assistant Teaching Professor in Fall 2020. Paulin grew up in the Highlands of Scotland and first realized he wanted to be a mathematician after watching the BBC documentary about Fermat's Last Theorem. He received his PhD from Imperial College London in 2008 in the field of p -adic number theory under the supervision of Kevin Buzzard. From 2008 to 2011 Paulin was a Morrey Assistant Professor at UC Berkeley, working closely with Robert Coleman, and from 2011 to 2014 he held lectureships at Nottingham University and King's College London, before returning to UC Berkeley as a lecturer. Paulin has a passion for teaching and over the past 6 years has taught two large lower division classes every semester, totalling over 10,000 UC Berkeley undergraduates. In 2020 he was awarded the UC Berkeley Distinguished Teaching Award, only the third mathematics department recipient in the award's 60 year history.



Yingzhou Li will start as Assistant Professor at Berkeley in Spring 2021. Li obtained his Ph.D. from Stanford University in 2017 and was a Phillip Griffiths Research Assistant Professor at Duke University from 2017 to 2020. His research focuses on designing and analyzing efficient algorithms to address problems from various fields, including differential and integral equations, computational chemistry, machine learning, and quantum computing. Besides math, he is a tech geek interested in technologies in robotics.

Staff News

It goes without saying that this past year has been an incredible rollercoaster of experiences, opportunities, challenges, and growth for our Math Department staff. The Fall '19 semester brought with it the opening of several positions in the department which resulted in many staff members stepping up to do "double-duty". A special thank you to Christine Tobolski, Heather Read, Brandon Eltiste, Thomas Brown, and Jon Phillips for their additional effort during this period.

As Spring '20 rolled around, we welcomed several new staff members while learning how to "shelter-in-place" amid the growing COVID-19 pandemic. Unable to return to campus, our staff worked as a team to address the challenges that confronted us and found new ways to maintain community and collaborate in what has become an all-too-familiar virtual setting. As social unrest and racial injustice took center stage during the summer, our staff responded by creating space to talk, listen, learn and share. The work is far from done but we have many enthusiastic and engaged advocates for change within our math community.

In June, we found a wonderful opportunity to gather (virtually) and celebrate our well-loved staff member and friend, **Judie Filomeo**, on her retirement after 22 years at Berkeley. More than 75 guests zoomed in from all over the world to share stories and thank Judie for being such a treasured part of our lives for so many years. "Thank you so much for supporting me. I'm going to miss everyone so much," she said as she took her first official steps into retirement.

We made several wonderful new hires this past year including **Jon Phillips** (Graduate Advisor), **Isabel Seneca** (Graduate Advisor), **Cecilia Coca** (Information Systems Analyst),



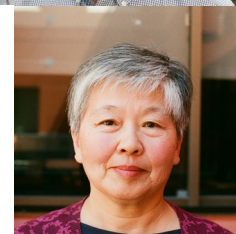
Almadora Henry (Office Administrator), and **Brian Underwood** (Department Manager). Additionally,

From top left: Judie Filomeo, Jon Phillips, Isabel Seneca, Cecilia Coca, Almadora Henry, Brian Underwood, Yue Liu.

we were very excited to announce that **Marsha Snow** accepted the position as our newest Undergraduate Advisor and **Brandon Eltiste** was promoted to Computer Systems Manager for the department.

Yue Liu retired from her role as Financial Analyst in October, after ten years with the department. We also said good-bye to a few other staff members including **Vicky Lee**, **Blaine Jones**, and **Holli Griffin-Strauss**, who all accepted other positions on campus.

Looking to the new year, we are both anxious and excited to see what's in store. If we have learned anything from this past year, it is that our staff is ready for any challenge and has proven itself capable of doing incredible things under unimaginable circumstances. (Brian Underwood, Department Manager)



MATHEMATICS + BERKELEY

FALL 2020 NEWSLETTER



First-year graduate students meeting outside in Berkeley, 2020

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 on donations from alumni and friends of the department. Here are some of the department's current top priorities:

- **Graduate Student Fellowships** are needed to enable the department to make competitive, attractive offers to the very strongest applicants to our graduate program, who are often being 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 come to Berkeley to deliver lectures in our department or collaborate with our faculty. These intellectual exchanges are of tre-

mendous 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. Undergraduate Research Fellowships are needed to enable undergraduate students to participate in summer research groups with faculty, postdocs, and graduate students.

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 Associate Development Director Ryan Guasco, email: rguasco@berkeley.edu or Department of Mathematics Chair Prof. Michael Hutchings, e-mail: chair@math.berkeley.edu.

Newsletter Contributors: Editors Nikhil Srivastava and Daniel Tataru. Thanks to Michael Hutchings, Melanie VandenBergh, Isabel Seneca, Jon Phillips, and Christine Tobolski. *Photography:* Mostly George Bergman and Pierre Simon. *Cover:* "Anticanonical slices of 3-dimensional Fano Manifolds", by Prof. Tom Coates, Berkeley PhD'03.

Berkeley

The Pacific Rim Conference on Mathematics (PRCM)

is a major interdisciplinary mathematical meeting which convenes regularly at one of several prestigious participating institutions chosen from the Pacific Rim region. It was conceived in the mid-1990s by a group of mathematicians from over ten major universities on the west coast of the United States, in China, Taiwan, Japan, Singapore, Korea and Australia.

The PRCM's first meeting was held in 1998 at the City University of Hong Kong. Since then, it has been held every three or four years. The Eighth Pacific Rim Conference in Mathematics was held online from Monday 3rd August to Tuesday 11th August 2020. Originally conceived as meeting at U.C. Berkeley, the conference took place in a virtual format.

This principal organizers of the conference were Alan Hammond and Fraydoun Rezakhanlou. PRCM had nine plenary speakers, forty-seven session speakers and ten sessions. The conference attracted over 1200 registrants via a form on the WordPress site; plenary talks were typically attended by between 80 and 150 people; session talks by between 40 and 100. Most of the talks were videoed, and the recordings have been posted on a youtube channel at <https://wp.math.berkeley.edu/pacificrim2020/>

MATHEMATICS + BERKELEY

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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- 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 (Fund #N7221).
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