# We are UCLA Mathematics Mathematics

FALL 2022

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## We are Mathematics

FALL 2022

Professor and Chair Mario Bonk

Chief Administrative Officer Ronke Epps

Editor in Chief Zenith Azad Farin

Managing Editor & Contributing Writer Barbara B. Pawley

Design Robin Weisz Graphic Design

Contributing Photographers Zenith Azad Farin Reed Hutchinson PhotoGraphics Penny Jennings

Cover Illustration Anna Godeassi

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To contact the editor or submit a story idea, email <u>communications@math.ucla.edu</u> or call 310-794-9080.

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## FROMETRE

We hope you enjoy the following stories in this fifth issue of our magazine, as we cautiously restore our campus presence after a year and a half of remote study.

The return to in-person learning has rejuvenated our student clubs and activities, and we are honored to continue to receive major endowments and gifts that directly benefit our students.

We welcomed an outdoor gathering for commencement with an inspiring address by an alumnus who excels in his career while giving back to the community. This year's graduating class included students who completed the new undergraduate data theory major, a joint endeavor with the UCLA Department of Statistics.

Professor Wilfrid Gangbo's unique journey from Africa is chronicled in this issue. He recently launched a highly successful summer program in collaboration with math professors at Stanford University and UC Berkeley.

We commemorate our longest serving faculty member, Bob Brown, who passed away this year. He was actively involved in academics well into his retirement, and we will miss him.

As we start this coming academic year, our faculty will continue their research and teach bright, young minds. We will keep you up to date about our activities and provide more stories about our faculty, students and alumni.

**Mario Bonk** Professor and Chair UCLA Department of Mathematics

#### **IN MEMORIAM**

# Robert F. Brown 1935 - 2022

hat colleagues remember most fondly about Bob is his dedication — 57 years of exemplary service, from his doctoral degree in 1963 to retirement in 2020. It is the longest tenure of any Department faculty member. His memoirists reflect that he was "a true mainstay, one of the people who, by his engagement with teaching and research throughout his career, endowed the Department with an awareness of its own history."

Above all, Bob had a profound affinity for teaching. He was awarded the Department's Distinguished Teaching Award twice, almost 20 years apart. In addition to his commitment to the undergraduate program, he was highly regarded as a dissertation advisor, mentoring 20 students from 1967 to 2008. According to the Mathematics Genealogy Project, Bob has had 44 mathematical descendants. As an open and approachable academician with an easy personal style, it is not surprising that he wrote many joint papers.



Ron Stern, an emeritus at the University of California Irvine, was one of Bob's PhD students, as well as a friend and longtime collaborator at the *Pacific Journal of Mathematics*. There Bob broke another academic record, serving on the board, including as president, for 51 years. Ron remembers, "When I was a student, he never tired of my often stupid questions and was always polite and gracious. Throughout my career I tried to imitate his mentorship, but was unable to match his equanimity."

In research, Bob became a global expert in fixed point theory with regular contributions to the field throughout his career. He originated the Nielsen fixed point theory of fiber maps, and his insight into the relationship of fixed point to root and coincidence problems set up the basics of the Nielsen theories for both. His last paper was published in 2021.

"A true mainstay, one of the people who, by his engagement with teaching and research throughout his career, endowed the Department with an awareness of its own history." Boju Jiang, a fellow expert in the field, describes Bob as "a world leader in topological fixed point theory since the 1970s," observing that his "contributions and impacts are reflected in the fact that his works are very widely cited." Boju and Bob were co-editors of the compendium *Handbook of Topological Fixed Point Theory*, along with Massimo Furi and Lech Górniewicz. Published in 2005, it stands as the definitive book in the field.

Bob's path to mathematics was not a straight line. Born and raised in Massachusetts, he characteristically stayed close to home as an undergrad, choosing Harvard University. He met Brenda there, and they married following graduation. They were enduring partners in every way, from parenting to writing an undergraduate textbook on finite mathematics for the Math 2 course. It was a well-received resource that was applauded by the students.

Bob was not immediately captivated by mathematics, instead earning his BA in linguistics. However, he happened to take a class in mathematical linguistics during his senior year, which excited him much more than the study of language. Realizing that he needed to learn more, he proceeded to take his very first math class — advanced calculus! After diving more deeply into mathematics, he changed course, earning a PhD from the University of Wisconsin in his new, chosen field before heading west to California and his future.

# Wilfrid Gangbo

## A Scholar's Journey from Africa to UCLA



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enin is a sliver of a country wedged between Nigeria and Togo and laid out in the form of a blunt dagger pointing into Africa's Gulf of Guinea. Slave traders launched their treacherous sea voyages to the Americas from the southern port.

After two centuries of human trafficking and another hundred years of foreign occupation, Benin finally achieved republic status in 1960. There followed a succession of coups before a fragile democracy emerged in 1990.

The country's longest-serving colonial overlord instituted French as the official language of Benin, which remains today. This historical happenstance created opportunities for a first-class university education in Europe for promising Beninese scholars, including a young Wilfrid Gangbo.

He remembers his father, a practicing physician, encouraging him and his siblings to develop applicable academic skills, like mathematics, that would sustain their careers. Wilfrid followed that advice throughout his early schooling and during his university years at the prestigious research institute École Polytechnique Fédérale de Lausanne (EPFL), in Switzerland. There he earned bachelor's, master's and doctoral degrees in mathematics in preparation for a career in academia.

Wilfrid recalls, "Growing up in a disrupted country, my family was the backbone of my stability. In school, I was drawn to mathematics because it was the one area where truth was less subjective. But I did not fully appreciate the possibilities until I started my dissertation."

In 1992, with PhD in hand, Wilfrid departed Europe for a research fellowship at Carnegie Melon University in the U.S. with only a rudimentary grasp of English. He explains that while he wanted to go home, there were no opportunities in academia because of Benin's impoverishment.

Wilfrid learned this new language quickly, aided by his colleagues and hours of TV viewing, becoming fluent by the end of his year-long tenure. Still unable to obtain a university job in Benin, he opted for a second fellowship at the Mathematical Sciences Research Institute (MSRI) in Berkeley, California.

Following his sojourn in Berkeley, Wilfrid decided to stay in the U.S., joining the Georgia Institute of Technology in 1995 as assistant professor. His strong academic record there earned him a full professorship within seven years.

Professionally secure and anchored in his adopted home, he and his wife Elvire, a Beninese French teacher, began a family. They raised two daughters who have also built lives and careers in the U.S.

Wilfrid was recruited to UCLA in 2016. He was attracted to the Department's interdisciplinary research portfolio and cutting-edge mathematics. He was also drawn by UCLA's inclusive spirit and openness to diversity and change.

Wilfrid has research interests in the calculus of variations, nonlinear analysis, partial differential equations, kinetic theory, functional analysis and fluid mechanics. He collaborates with a range of academicians from other fields. Currently, he is working on a program based on the Nash equilibrium, which is of interest to scholars in the fields of economics and finance.

Considered revolutionary 70 years ago when it was invented by John Forbes Nash Jr., this game theory is now a standard mathematical framework for economics and the most common solution to problems in non-cooperative games involving two or more players.

Wilfrid's particular interest in the Nash equilibrium centers on problems stemming from its role in a fair market economy. He explains, "In this environment, you cannot maximize your position — as we are often led to believe — because no matter what strategy you employ, you do not know what your competitors are doing or how they will react to what you do. Therefore, the more realistic goal, which is widely understood in economics, is to achieve and maintain equilibrium among your competitors." This game theory plays out in many fields.

Wilfrid is studying the anomalies that may arise in this model. "I am exploring, mathematically, how paradoxical factors may affect the Nash equilibrium in the context of pricing. I'm not working in economics, but people in financial mathematics may find what I'm doing applicable."

Wilfrid has always had a deep commitment to professional service. His lifelong focus has been on academic advancement for underrepresented populations — making the world a more level playing field. To this end, he says, "I've been involved with Africa for a long time."

"I was drawn to mathematics because it was the one area where truth was less subjective. But I did not fully appreciate the possibilities until I started my dissertation."

In the 1980s, he founded EcoAfrica as an international association of scientists working with projects on the continent, and he has worked diligently throughout his career to advance the Institute of Mathematics and Physics, based in Benin. The institute is now one of the most important academic research and training centers in Sub-Saharan Africa, excluding the country of South Africa. He currently serves on the advisory board and conducts seminars and workshops there during his annual summer visits. He is proud to announce, "We recently relocated to a completely new facility so we can respond to the need for access and engagement by African students and scholars."

At UCLA, he is a driving force in develop-

ing academic programs that promote diversification and inclusivity and advance underserved students in mathematics. In 2020, with co-founder Tim Austin, he led the pilot Math Bridge Summer Program In collaboration with local California State University (CSU) campuses. The program aimed to help high-potential CSU students in their applications to mathematics graduate programs. The CSU system is a key source of doctoral candidates for UCLA.

In his most recent undertaking, Wilfrid has teamed with Todd Coleman (Stanford) and Jelani Nelson (UC Berkeley) to develop a bold and unique program that they hope will secure success for a small number of underrepresented undergrads seeking PhDs in the mathematical sciences. They launched the David Harold Blackwell Summer Research Institute in 2021 with six promising undergrads. The three professors plan to provide one-on-one mentoring to two students each, who will work on individualized research studies over the course of six weeks. Conducted remotely in 2021, the program will be onsite at the three campuses going forward. All student costs are underwritten by the institute. Wilfrid says, "The candidates are chosen not necessarily for their academic achievements, but for what we perceive as their future potential as mathematicians." Three of the six students in the inaugural program, all women, who applied to graduate school in 2022, were accepted at premier U.S. universities. The professors are in agreement that this is a strong early validation of their robust approach to mentoring.

In recognition of his academic merit and continued promise for scholarly achievement, Wilfrid was awarded the 2018-2019 Chancellor's Professorship by the University of California Berkeley Department of Mathematics. Most recently, he and Haruzo Hida were among 11 UCLA faculty members elected to the 2022 Class of the American Academy of Arts and Sciences, one of the nation's most prestigious honorary societies.



Wilfrid Gangbo (center) with summer students Daniel Block (left) and Moises Rivas (right)

# Robert S. and Lori K. Harrison

DOING THE RIGHT THING, TO THE RIGHT PERSON, FOR THE RIGHT REASON, AT THE RIGHT TIME



Lori and Bob Harrison

lumnus ('86) and Commencement speaker Bob Harrison has dedicated his 30-year career to banking, starting with his first job at Chase Bank to his current position as chairman of the board, president and chief executive officer of First Hawaiian Bank.

Bob stresses the importance of optimism in banking because "you are lending money to people that isn't yours and hoping they will pay it back." But, he counters, "You also have to be a realist because sometimes things don't work out as planned and sometimes things happen beyond your control." He calls these "fairly regular black swan" events, such as wars, pandemics and market collapse.

For Bob, a UCLA mathematics degree was foundational. "It was never easy but when I put in the time, I did well and felt comfortable. The rigor involved in getting the degree was just as important. My love of math led to a superb business school and a formative first job. That important first job got me to the next and so on." In speaking at Commencement, he described mathematics as a "golden ticket" degree that can be applied to many great careers.

Despite the impact on his life, mathematics was not a direct route for Bob. He was the only one of his siblings who did not go straight to college after high school. He worked in construction for a year, taught scuba diving and then served in the U.S. Navy at Pearl Harbor. He enjoyed Honolulu, opting to stay after his discharge three years later and attend the University of Hawaii (UH) with a major in chemistry.

Bob met his future wife, Lori, in a lab class during their freshman year. Lori was pursuing a nursing degree based on her mother's recommendation. She says, "My mom told me I would get a lot fulfillment out of it, and she was right. I really loved nursing and still do." She is now a nurse practitioner specializing in obstetrics and gynecology at Kaiser Permanente.

In speaking at Commencement, he described mathematics as a "golden ticket" degree that can be applied to many great careers.

Partially through her undergraduate coursework at UH, Lori chose to transfer to Mount Saint Mary's University in Los Angeles because the school was teaching a new nursing model. This appealed to her because it approached the field from a range of perspectives - spiritual, philosophical, mental and physical. Bob's interests moved from chemistry to mathematics, and he transferred to UCLA so they could be in the same city. When they graduated in 1986, they married and moved to New York where Bob had been accepted into an MBA program at Cornell University. While he studied, Lori worked in a local hospital, which gave her a strong landing pad and an introduction to community nursing, which she has promoted throughout her own 30-year career.

Following Bob's master's degree, the couple moved to New York City where he launched his banking career. After navigating city life for a few years, they began to have misgivings about raising children there and decided to relocate to Hawaii. Lori's family has deep roots in Hawaii going back generations, and now pregnant with a second child, she wanted more support. Additionally, they both craved a more relaxed lifestyle. They settled in Honolulu and raised their three children there.

Bob joined First Hawaiian Bank in 1996 as a lender. Ten years later, he became the chief risk officer and then steadily rose to the top, working through the COO position to CEO. He maintains that the slowly diminishing brick-and-mortar model of banking is both the biggest challenge in his work as well as a fortuitous opportunity. "When I was launching my career, there were almost 14,000 banks in the U.S. That number has dropped 70 percent to just over 4,000. We anticipate it will decrease another 30 percent or more in the future."

He describes the banking industry as dynamic. "Changes in technology are always affecting the way we do business, and we have to keep abreast. At the same time, I try to stay engaged with the customers and the employees. As we move forward, it's important to bring our employees with us. That's what the customers want."

While their lives are focused on living and working in Hawaii, Bob and Lori travel frequently. He says, "I traveled for business and Lori often came with me, and we made a vacation out of it. The bank had business interests first in Paris and then in Asia. After we had kids, we mostly spent our vacations in Kauai, hiking and just being outdoors. Now I travel to major cities in the mainland six-to-eight times per year, and Lori still comes with me when she can. You just have to acquiesce to long plane flights."

Lori describes their philosophy of life: "Follow the rule of camping and leave things better than when you came." Both Lori and Bob are committed to their community. They value the unique island lifestyle and want to support it, especially for people who are struggling. He points out, "You're going to see the same people over and over, probably for the rest of your lives. You're two steps away from knowing most of the people you meet here, even in the grocery store. It causes you to both work and live differently and be kind. No one honks in Hawaii."

Bob is particularly committed to advancing health and human services. One of his biggest roles is with the Hawaii Medical Service Association (HMSA), the Blue Cross Blue Shield affiliate in Hawaii, where he's been a board chair for 10 years. As the biggest company in the state with four billion dollars in revenue, HMSA provides substantial resources to the community. He states, "I feel that we really make a difference. We focus on how to bring people who are disadvantaged into not just the healthcare market, but social services, housing and jobs. It's not what I expected when I started. But health no longer is just about going to the doctor or hospital. You need to dig a little deeper to get to the root of the problem. Otherwise, you're not stemming the cost of healthcare." He has a caveat though. "There is the issue of personal responsibility, which we also try to address. We have to be active participants in our wellbeing."

As Bob and Lori give back to their community, they also sustain ongoing philanthropic relationships with the schools they have attended. This year, the UCLA Department of Mathematics is proud to announce a generous gift, the Robert S. and Lori K. Harrison Undergraduate Scholarship, benefiting mathematics students. Lori states, "We understand the importance of access. It's not easy to get into a school like UCLA, but Bob and I thought, how can we help to keep students there? How can we help with that gap between their financial aid and their living expenses, which we experienced as students? It's so often the non-educational costs that cause them to drop out."

Hawaiians have a word that is a key principle for First Hawaiian Bank and for Bob and Lori Harrison. The word is *kinaole*. It means doing the right thing, to the right person, for the right reason, at the right time.

#### Robert S. and Lori K. Harrison Undergraduate Scholarship

Robert S. and Lori K. Harrison established a \$250,000 endowment for UCLA Department of Mathematics students who are in need of financial support to maintain their studies.

## **UCLA BACHELOR OF SCIENCE IN DATA THEORY**

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## USING TOOLS BASED IN MATHEMATICS AND STATISTICS HAS BECOME THE LANGUAGE OF DATA

hanks to consequential advances in computer science, the sources and types of information available to us have multiplied with escalating complexity, creating a world that is flush with data. It's the latest technological revolution, and it's transforming even the humanities. Without the means to effectively interpret and manage the mountain of data bombarding us, living in our multifaceted societies may become confusing and even immobilizing.

To harness its potential, academicians are acknowledging a striking need for data science education to go beyond collection, storage, integration and analysis and for leaders, educators and dreamers to advance the discipline. UCLA is privileged to be one of the first universities to meet this challenge by creating a bachelor of science degree in data theory.

Jointly developed by the UCLA departments of mathematics and statistics, the newly minted undergraduate major was envisioned by a cadre of faculty who compare the strength of the curriculum to a master's degree in machine learning, a subject currently at the core of data science.

In the new major, upper division proof-based math and probability theory bring substantial depth to the rigorous statistics coursework while classes on the societal aspects of data and the principles of data ethics prepare students to be good stewards in their future careers. Additionally, the following new courses have been developed for the major: Mathematical Methods of Data Theory; Introduction to Data-Driven Mathematical Modeling: Life, The Universe and Everything; Data Technologies for Data Scientists; and of particular importance for future data scientists who will help mold our world, Societal Impacts of Data. A capstone project provides opportunities to work on real world issues and topics during the senior year.

A \$1 million gift from UCLA math alumnus Kirk Dunn ('83) laid the foundation for the major and established the Dunn Family Endowed Chair in Data Theory. With a matching gift from the Division of Physical Sciences, the program launched in 2019 with the following objective: Prepare graduates for leadership roles in academia and industry over a wide space, including the physical and social

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sciences, medicine, government and business. Miguel Garcia-Garibay, professor and dean of the UCLA Division of Physical Sciences, expects that "most of the graduates will have boundless career opportunities."

Mathematics professor Deanna Needell is the recipient of the inaugural Dunn Family Chair. She explains that the data theory curriculum is a unique opportunity for students to explore the subject within a mathematical context and with a focus on theoretical foundations. She says, "Math skills are especially important in fields where data is driving research applications, like in tech and public health. Math-fueled data science is essential in all areas of the physical and biological sciences as well as in finance and even policymaking. Technology, particularly as we're seeing it in A.I., demands sophisticated and fast-paced data development by people who have a strong grasp of advanced mathematical concepts."

Rob Gould is a teaching professor and undergraduate vice chair of the statistics department and a key architect of the major. He says that for UCLA statisticians, the impetus for the program is a desire to give students the opportunity to enhance their study of theory, which will increase their success in graduate school. It is expected that many of the data theory graduates will opt for masters' or doctoral degrees in related fields.

The major was designed to accommodate a cohort of 40 students, although the first graduating class in spring 2022 was smaller. The next class is estimated to comprise about 80 students and the class after that closer to 90. Rob observes, "The major is becoming very popular very quickly. One of the reasons is that students are seeing how data science is emerging as a key driver of everything in life, and it is employed in every academic field."

Data science education is Rob's primary area of interest and expertise, which he has applied to the first capstone course taken by students entering their senior year in 2021. In preparation for teaching the course, he conducted an informal survey and identified three areas of interest among his students — theory and mathematics, applications of data science and computer science. Rob reports, "So far, about half the students



Left, Deanna Needell, Department of Mathematics. Right, Rob Gould, Department of Statistics

### Tang Tam Kam Foon Educational Trust Fund

Susanna W. Tang ('76) and Albert Scherm III established a \$100,000 scholarship in honor of Susanna's mother to encourage and support minority and women undergrads in financial need who are majoring in data theory or are part of the Women in Math student association. The UCLA Division of Physical Sciences has expanded the reach of this generous endowment with a \$150,000 matching gift.

I've spoken with say they want jobs in industry, so it's likely that a good portion of the others are considering academia, which is an outcome we are working toward."

The 2022 academic year marked UCLA's first Data Theory in the World Seminar. Dean Garcia-Garibay hosted the event, and statistics professor Mark Handcock, another architect of the major, moderated it. The topic was business, specifically the ways in which data drives business decisions. It featured five panelists who have had leading roles as data scientists in major U.S. businesses and successful startups.

The panel was organized by Kirk Dunn, who explained in his presentation, "Going back to the '20s, '30s, '40s, data was always the core of business. Take Henry Ford for example. Just inventing a car was not enough to sell it. Now answers to the questions that marketing people have always wanted to ask are available, and they're free." Going forward, other themes will be developed for the seminar with the same instructional design, which was enthusiastically received by the students.

Altogether, these nascent efforts by the first data theory pioneers will enable us to work smart, live well and adapt to new worlds of science that are already in development.



"Everything in the digital space, is powered by data, even beauty."

PRAMA BHATT, chief digital officer for Ulta Beauty

# RAYMOND REDHEFFER Prize in Mathematics

alled the "brilliant hacker kid" as a teenager, data scientist and alumnus Daniel Gutiérrez ('78) had only computers on his mind when he was accepted at UCLA. But at that time, a bachelor's degree in computer science was offered in conjunction with mathematics, so he begrudgingly signed up for a freshman calculus course. Fortuitously for Daniel, the class was taught by mathematics professor Raymond Moos Redheffer (1921-2005), a storied lecturer with a reputation for motivating students who happened upon his calculus courses. Daniel became an instant fan, immediately gaining a new understanding and appreciation for the power of mathematics.

Ray's compressed lecturing style earned him the nickname, the "lightning lecturer." One of his teaching techniques was assigning massive amounts of homework, which he collected by procedures that would often incorporate math lessons. He was known for his wooden "homework boxes," organized according to discussion section and passed around to students during the lectures. He built these boxes himself and would construct them for other Department faculty members, upon request.

In addition to his superior instructional abilities, which were recognized campus-wide by a UCLA Distinguished Teaching Award, Ray had an impressive publication history with over 200 scientific papers and three influential textbooks. Beyond academics, his activities and interests were diverse. He learned and spoke fluent German and held several visiting faculty positions in that country. In addition to academics, he was an artist, taught special education classes geared to deaf students, and he had a long collaboration with designers Charles and Ray Eames. At one point, he worked with the Eames studio to produce short films illustrating mathematical ideas through visual images as a way to popularize the subject.



Data scientist and alumnus Daniel Gutiérrez

Daniel remembers, "Looking back at my college years, I feel grateful for mathematics and my math professors. If I had just taken computer science, I wouldn't have such a strong foundation, which I benefit from every day."

Daniel enjoys a multidimensional career encompassing business, writing and teaching. He is a data science consultant leading his own firm, Amulet Analytics, where he uses predictive analytics and data visualization to extract valuable and often unforeseen business knowledge from enterprise data assets. An accomplished technical writer, he has published several textbooks and currently serves as editor-in-chief for the international website insideBigData. As a lecturer in computer science at UCLA Extension, Daniel inspires his own students who are studying in STEM fields. They credit him for speaking plainly (successfully translating complex technology into simple terms). His 15 years of service there includes curriculum design for an online certificate program in data science.

In 2021, Daniel made a decision to give back by establishing an annual award, the Raymond Redheffer Prize, to recognize a mathematics graduate student who has excelled at teaching freshman calculus. In honoring his mentor and his freshman experience in UCLA math, he says, "It was a sort of metamorphosis, in a lot of ways shaping me for the rest of my life."

What well-known code is used in the rectangular element above the eye, and what does it say?\*



The Eye, created by Raymond Redheffer, circa 1970.

UNDERGRADUATE MATH COUNCIL

he impact of the COVID pandemic on educational goals, social relations and university life created personal and academic issues for many UCLA students, including math undergrads, who were navigating demanding coursework. Grappling with a closed campus and online instruction, the university was not prepared to handle the unexpected challenges of the pandemic. Events happening across the country and the ongoing equity issues on campus created a new urgency for the UCLA Office of Equity, Diversity and Inclusion (EDI).

In summer 2020, the Department created its own EDI Committee, composed of faculty, postdocs, staff and students, to tackle a broad array of issues. The committee has since focused on tangible solutions for creating a more inclusive environment and improved communication on all levels. One outcome was the formation of undergraduate Town Hall meetings, which added student voices and input to Department policies and decisions.

The Undergraduate Math Council (UMC) is a direct product of the Town Hall meetings, formed as a student-run group in 2021 by sophomores Ragini Srinivasan, Lisa Wang and Amos Ancell. UMC's goals are to facilitate more effective communication between math undergrads and the Department and discuss EDI initiatives in Department policies.

Council members juggle their advanced coursework while coordinating three committees — communications, event planning and student support — and putting their hearts into bringing UMC to life. They are grateful for the support of individual faculty members like math professor Mike Hill, who serves as their mentor.

A number of UMC members were motivated to join by their feelings of alienation in their classrooms. Those unfamiliar with Los Angeles felt excluded from the city as well. They noted, "UCLA has a diverse student body, but in our math courses, we realized that many of our peers' backgrounds and the overall culture did not reflect that diversity."

During its inaugural year, the council took several steps to bring the math undergraduate community together.

Nurturing and growing the group's Instagram account has been essential to the success of its outreach efforts. The communications team maintains the account, creating eye-catching postings with graphics and text that promote math-related resources and help publicize the wide diversity and interests of the students.

UMC's event planning team hosted three professional development events during the academic year. They featured Pablo S. Ocal, a math postdoc researcher; Justin Williams, a quantitative analyst for the L.A. Dodgers; and Avijit Nalwa, an actuarial analyst coming into the UCLA MBA program. The last event was planned in collaboration with UCLA Women+ in the Physical Sciences.

The student support team coordinated with Department faculty and staff to create new and expanded resources for undergrads, such as revised course descriptions and informational maps for each math major to help in scheduling classes.

Ragini, Lisa and Amos envision bringing the UCLA math community closer together through their projects and shared enthusiasm. The council members put a lot of work and dedication into each post, event and project. They hope to make the undergrads —no matter their identity — feel that they have the necessary resources to thrive in their academic careers and truly belong.



Undergraduate Math Council members: (back row, left to right) Ragini Srinivasan, Will Firmin, Ricardo Ramirez, Amos Ancell (front row, left to right) Gia Ahuja, Lisa Wang, Damien Ha. Sachi Dieker is pictured on the computer.



## College | Physical Sciences

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