

The background of the cover is a photograph of a night sky with the Milky Way galaxy visible. In the foreground, there are large, classical stone columns and arches, illuminated from below, creating a warm, golden glow. The sky is a deep blue, and the stars of the Milky Way are scattered across it. In the bottom left corner, the top of a building with a dome is visible.

# UCLA COLLEGE REPORT

Winter 2015 | Volume Twenty-Five

From the Deans of the **UCLA College**

*Dear Friends,*

*Throughout history, humankind has been driven by the desire to explore, discover and solve. In many ways, it is the unknown that propels our progress, and the journey that fuels our ingenuity.*

*Here at the UCLA College, our faculty and students work side by side to imagine the impossible, seek the unattainable and reach beyond their grasp.*

*In this issue of the College Report we chose to highlight that never-ending pursuit by describing some of the College's contributions to space exploration. At the center of the magazine, you will find a sampling of how our faculty members, research scientists, students and alumni have led the way in probing the mysteries of space. From planets to comets and asteroids, from black holes to nebulae, and from technologies to astronauts, the College's space discoveries and contributions are among the most notable in the world.*

*It is not just in this frontier that our researchers are pushing the boundaries of knowledge. In the Life Sciences, Social Sciences, Humanities and even in the way we teach our students, the UCLA College is breaking ground with innovations and discoveries that will better our lives.*

*We hope you enjoy reading in the pages that follow about some of our most recent breakthroughs, as well as the students and donors who make this work possible.*

*Sincerely,*

**Joseph Rudnick**

*Senior Dean, UCLA College  
Dean of Physical Sciences*

**Alessandro Duranti**

*Dean of Social Sciences*

**David Schaberg**

*Dean of Humanities*

**Victoria Sork**

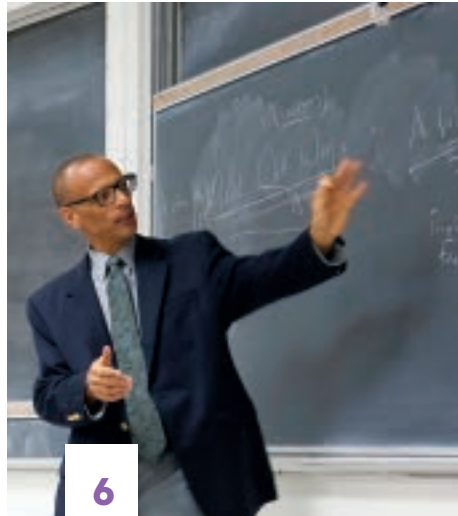
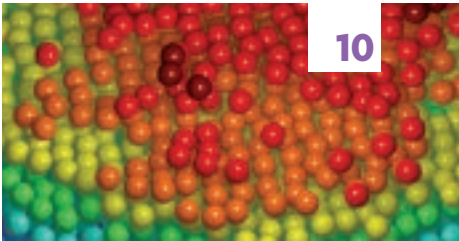
*Dean of Life Sciences*

**Patricia Turner**

*Dean and Vice Provost for  
Undergraduate Education*



Left to right: Joseph Rudnick, Patricia Turner, David Schaberg, Alessandro Duranti and Victoria Sork



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Photographer Jeff Lewis '14 created this vision of what the night sky over UCLA could look like without light pollution. A landscape photographer, Lewis earned a bachelor's degree in meteorology from UCLA. Blending his expertise in meteorology and photography, he uses satellite images, weather models, and short and long-range forecasts to predict when and where to find the best light for his work.

## UCLA College

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## UCLA Scores Highly in National and Global Rankings

**UCLA IS NO. 2 AMONG THE NATION'S PUBLIC UNIVERSITIES AND NO. 23 OVERALL IN THE 2016 U.S. NEWS & WORLD REPORT "BEST COLLEGES RANKINGS." THE REPORT PLACES UCLA IN A TIE WITH CARNEGIE MELLON UNIVERSITY AND THE UNIVERSITY OF SOUTHERN CALIFORNIA IN THE OVERALL RANKINGS.**

UCLA received the highest score for economic diversity among all national universities, based in part on the fact that 39 percent of UCLA undergraduate students receive Pell Grants. Also contributing to the campus' overall ranking were its high graduation and freshman retention rates.

*U.S. News* also issues rankings according to more specific measures. Among the "best colleges for veterans," the publication chose UCLA as the No. 1 public institution (tied for No. 18 overall). UCLA was No. 3 among public universities (tied for No. 8 overall) in "campus ethnic diversity" and tied for the No. 4 public university (tied for No. 27 overall) among "high school

counselors' top college picks," which is based on academic advisers' impressions of the quality of undergraduate education at each institution.

***U.S. News & World Report* ranks UCLA among top 10 universities in the world**

A separate global rankings report from *U.S. News & World Report* ranked UCLA the No. 8 university in the world and the No. 2 public university in the United States. The university remained in the same spot it held last year in the inaugural Best Global Universities report.

*U.S. News & World Report* included the top 200 universities from the Thomson Reuters' global reputation survey, which aimed to gather academics' opinions of universities around the world.

In addition, the report considered universities that published the most articles between 2009 and 2013. The report then calculated rankings based on 12 indicators of global research performance such as global and regional research reputation, total citations and international collaboration.

The Best Global Universities rankings were created to allow students to compare institutions around the world, as increasing numbers of students plan to attend universities outside of their country, according to *U.S. News & World Report*.

**Consistently strong showing in a range of international surveys**

UCLA is once again listed among the best universities in the world by the Times Higher Education World University Rankings. In its 2015–16 report the Times ranked UCLA No. 16 worldwide and No. 11 in the U.S. The publication analyzed 800 universities overall and 147 in the U.S.

The survey takes into account a variety of indicators including quality of teaching and research, knowledge transfer and international outlook. Among U.S. public universities, UCLA trailed only UC Berkeley, which was No. 13 overall.

In August, UCLA was also second among U.S. public institutions and No. 12 overall in Shanghai Jiao Tong University's Academic Ranking of World Universities.



## UC System Recognized as Best Value, an ‘Upward-Mobility Machine’

**THE COLLEGE SCORECARD UNVEILED BY THE WHITE HOUSE IN SEPTEMBER REFLECTS THE BROAD VALUE OF UCLA AND OTHER UNIVERSITY OF CALIFORNIA CAMPUSES AND THE EDUCATION THEY PROVIDE.**



The scorecard, which bases its analysis on data from students who received federal financial aid, shows that UCLA and other UC campuses are a good investment not only for students and their families, but for the federal government and the state.

“The University of California is one of the best values in higher education,” UC President Janet Napolitano said. “The newly released scorecard showcases the excellent performance of all 10 of our campuses in the areas measured, including cost, graduation rates and student debt levels. I hope this scorecard will help to improve accountability — at all institutions — for the billions of student aid dollars distributed by the U.S. Department of Education.”

At UCLA, 91 percent of students graduate within six years, well above the national average of 44 percent for four-year colleges and universities, according to the scorecard’s interactive website at <https://collegescorecard.ed.gov>. In addition, 96 percent of students return after their first year, compared with the national average of 67 percent.

Among former UCLA students who received federal financial aid, the median salary 10 years after enrolling was \$59,200, exceeding the national average of \$34,343.

The scorecard shows that graduates of UC campuses are much more likely than others to have begun to pay down their college debt. Only about half of UC undergraduates borrow to help pay for the cost of their education, while 55 percent of California students receive enough financial aid to fully cover tuition.

UC campuses also were highlighted in documents released alongside the data. UCLA was hailed for enrolling a large share of students receiving federal Pell Grants and serving them well. In addition, five UC campuses — UC Berkeley, UCLA, UC Davis, UC Irvine and UC San Diego — were listed by the Education Department as among 15 public colleges that fall in the top 10 percent of all four-year schools for their graduation rates and median earnings.

### UCLA ranks No. 5 in national survey of universities’ economic diversity

UCLA is among six University of California campuses in the top 10 of a *New York Times* ranking that measures which colleges and universities are doing the most for low-income students. The rankings take into account graduation rates and cost of attendance.

The College Access Index, created by the *Times*’ Upshot blog, is based on the share of students who receive federal Pell Grants, the graduation rate of those students and the amount that low- and middle-income students pay to attend.

UCLA is fifth on the list, and five other UC campuses are among the top seven: Irvine (1), Davis (2), Santa Barbara (3), San Diego (4) and Berkeley (7).

An accompanying article calls the UC system an “upward-mobility machine,” noting the university’s deliberate steps to attract students of modest means, especially transfers from community colleges.

“The transfer pipeline is crucial, because many highly qualified low-income students — unaware of how much financial aid is available at four-year colleges — first enroll at local community colleges, where published tuition tends to be low,” the article says.

## In Memoriam: Richard Heck, UCLA Alumnus and 2010 Nobel Laureate

**RICHARD F. HECK, A UCLA ALUMNUS WHO WON THE 2010 NOBEL PRIZE IN CHEMISTRY, DIED OCT. 9 IN MANILA AT THE AGE OF 84.**



Richard Heck returned to UCLA in 2011 to accept the Glenn T. Seaborg Medal.

Along with Ei-ichi Negishi and Akira Suzuki, Heck shared the 2010 Nobel Prize in chemistry for creating the “Heck reaction” (a palladium-catalyzed carbon cross-coupling reaction), which has been hailed for its widespread application in

many areas of modern life, such as drug development, electronic display screens and DNA sequencing. According to the Nobel Prize organization, the discovery “would transform modern organic chemistry.” He was one of seven UCLA alumni Nobel laureates.

Heck earned his B.S. degree in chemistry in 1952 and his Ph.D. in physical organic chemistry in 1954 from UCLA. After leaving UCLA, Heck did research for one year with Nobel laureate Vladimir Prelog, a professor at the Swiss Federal Institute of Technology in Zurich. In 1955, Heck returned to UCLA and continued his research on neighboring group effects, an area of study that is now included in all organic chemistry textbooks.

In 1956, Heck went to work for the Hercules Powder Co. (now Ashland Inc.) at its research center in Wilmington, Delaware, where his research led to the Heck reaction. He left the company in 1971 to join the faculty of the University of Delaware where he continued work in his field of interest. He retired in 1989 as the Willis F. Harrington Professor Emeritus of Chemistry and Biochemistry at the University of Delaware after a career in which he had published more than 200 scientific papers.

## Faculty Honored for Research, Teaching; Alumna Shatters Glass Ceiling



Claudio Pellegrini talks with President Obama in the Oval Office after receiving the Enrico Fermi Award in October. Photo: Pete Souza/Official White House Photo

**PRESIDENT BARACK OBAMA NAMED UCLA PHYSICIST CLAUDIO PELLEGRINI A RECIPIENT OF THE ENRICO FERMI AWARD, A PRESIDENTIAL AWARD AND ONE OF THE GOVERNMENT'S OLDEST AND MOST PRESTIGIOUS AWARDS FOR SCIENTIFIC ACHIEVEMENT.**

Pellegrini — a Distinguished Professor Emeritus of Physics and Distinguished Research Professor at UCLA, as well as a visiting scientist and consulting professor in photon science at the SLAC National Accelerator Laboratory — shares the award with Charles Shank, laboratory director

emeritus at the Lawrence Berkeley National Laboratory and a senior fellow with the Howard Hughes Medical Institute. The award, which carries an honorarium of \$50,000 that is shared equally and a medal, is administered on behalf of the White House by the U.S. Department of Energy.

"This is a great honor," Pellegrini said. "Most of the work being recognized has been done here at UCLA. I am deeply grateful for the important support I received over many years from the university, my colleagues, students and postdocs. This award is a recognition for everything they have done to help me."

The Fermi Award, presented to outstanding scientists since 1956, recognizes distinguished achievement, leadership and service related to basic and applied research, science and technology supported by the U.S. Department of Energy and its programs.

Pellegrini received the award "for pioneering research advancing understanding of relativistic electron beams and free-electron lasers, and for transformative discoveries profoundly impacting the successful development of the first hard X-ray free-electron laser, heralding a new era for science."

### Andrea Ghez awarded Royal Society's Bakerian Medal

**Andrea Ghez**, UCLA College's Lauren B. Leichtman and Arthur E. Levine Professor of Astrophysics, was awarded the 2015 Bakerian Medal, the Royal Society's premier prize lecture in the physical sciences.

"The research that is being recognized is the product of a wonderful collaboration among the scientists in the UCLA Galactic Center Group and the University of California's tremendous investment in the W.M. Keck Observatory. Having cutting-edge tools and a great team makes discovery easy," Ghez said.

The medal is accompanied by a cash prize of 10,000 GBP (approximately \$15,500). The organization, the oldest scientific academy in continuous existence, cited Ghez's "acclaimed discoveries using the techniques of optical astronomy, especially her sustained work on the motions and nature of the stars orbiting the black hole in the center of our galaxy."

Since 1995, Ghez has used the Keck Observatory, which sits atop Hawaii's dormant Mauna Kea volcano, to study the rotational center of the Milky Way and the movement of thousands of stars close to this galactic center. The observatory houses the world's largest telescope.



Andrea Ghez

### Paul Barber honored nationally for commitment to diversity in science

**Paul Barber**, professor of ecology and evolutionary biology, was honored for his work advancing diversity within STEM fields by the Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) at its national conference.

In 2004, Barber founded the Diversity Project, an international undergraduate research program for underrepresented students that promotes diversity in marine science. At UCLA, he serves as the faculty director for the Program for Excellence in Education and Research in the Sciences (PEERS) — the university's largest academic support program for underrepresented and underserved students in STEM majors.

SACNAS assists Native American and Chicano/Hispanic scientists, from college students to professionals, in their efforts to attain advanced degrees, careers and leadership positions in science.



Paul Barber

### UCLA alumna Louise Richardson shatters glass ceiling at Oxford University

UCLA alumna **Louise Richardson '80** is set to become vice chancellor of Oxford University, the first woman to hold that post. As the senior officer for Oxford, she will provide strategic direction and leadership of the collegiate university and represent Oxford internationally, nationally and regionally. She will assume her new post in January.

Widely recognized as an expert on terrorism, Richardson earned her master's in political science at UCLA in 1980. Born in the Republic of Ireland, Richardson also holds a B.A. in history from Trinity College, Dublin,

and an M.A. and Ph.D. in government from Harvard University.

Richardson said she greatly enjoyed her time at UCLA. "Trinity had a program that funded two students, one in the arts and one in the sciences, to go to the University of California for a year," she said. "At UCLA, I studied international relations, as I was trying to get as far away from Irish nationalism as I could. I got a strong disciplinary and theoretical foundation, which was invaluable."



Louise Richardson

### Robin Kelley wins 2015 Angela Y. Davis Award for public scholarship

**Robin Kelley**, a distinguished professor of history and holder of the Gary B. Nash Endowed Chair in United States History, is the recipient of the 2015 Angela Y. Davis Award for public scholarship presented by the American Studies Association.

The award is given annually to a scholar who has applied his or her scholarship for the public good by means of education, policies or other methods that seek to address inequalities in imaginative, practical and applicable forms. Kelley is recognized for his contributions in educating and influencing the public about structural inequality and the power of radical collectivity.



Robin Kelley

# English Department Expands Creative Writing Offerings

New Faculty Members Create Opportunities for Growth



Fred D'Aguiar is the College's new head of creative writing. Photo: Alyssa Bierce

By Jessica Wolf

**THE UCLA ENGLISH DEPARTMENT IS DOUBLING-DOWN ON THE RIGHT-BRAIN MENTALITY OF UNDERGRADUATES. STARTING IN FALL 2016, NON-ENGLISH MAJORS WILL FOR THE FIRST TIME BE ABLE TO ENROLL IN A CREATIVE WRITING COURSE — A GENERAL EDUCATION INTRODUCTORY CLASS — CURRENTLY UNDER CONSTRUCTION AND TO BE TAUGHT BY UCLA PROFESSOR AND ACCLAIMED NOVELIST MONA SIMPSON AND NEWLY HIRED HEAD OF CREATIVE WRITING FRED D'AGUIAR.**

“Exposure to the art of writing — or rather, arts, there are many forms of writing — increases our ability to empathize,” said D’Aguiar, an award-winning poet and novelist who joined the faculty last spring and began teaching two classes this fall. “That act of feeling connected to the narrative fate of a character on a flat page, if you can empathize with that, it can wake up a dormant ability to empathize with others in the world around you, even when they look, behave or believe differently from you.”

Given the potential for polarized rhetoric in modern society, especially around political campaigns, civil unrest, and diversity issues, as well as our technological ability to build walls around information that doesn’t match up with pre-existing opinions, investing in empathy, critical thinking and creative expression can have a positive ripple effect into the culture at large, D’Aguiar said.

### **Fueling empathy through creative writing**

D’Aguiar sees the study of creative writing as valuable for students, whether they are bound for mathematics, medical school, the tech industry, publishing or academia.



A former psychiatric nurse, D'Aguiar's own creative practice and teaching aesthetic are deeply imbued with a commitment to empathy. He's fervent in the belief that creativity and higher education fuel students' empathetic nature.

There's also a precious humility factor inherent in a creative writing course, he pointed out. Students learn not only how to flex their more creative-thinking muscles, but how to be critiqued, edited, even humbled, he said. They learn how to recognize what is good — and what maybe isn't, and how to let go.

This is extremely useful in workplaces from Google to Disney, where innovation and creativity rule and are often driven by brainstorming, D'Aguiar said.

"In a creative writing course, students learn how to present an idea, when to promote it, when to let go and when to compromise," he said.

D'Aguiar was hired to head the creative writing program as senior faculty member alongside a new assistant professor, Justin Torres, who arrives in January. Torres graduated from the top writing program in the country, the Iowa Writers' Workshop.

These additions help round out the department's creative writing faculty. Ali Behdad, professor and chair of the English department, said the hope is that the program will eventually evolve into a minor open to all undergraduates, meeting the existing demand for creative writing classes. Currently only English majors may enroll in creative writing courses, and then only as a "concentration," not an official minor. With 900 English majors alone, the department turns far more interested students away than it's able to include.

"We know the creative writing minor and course are going to be popular," Behdad said. "The focus is going to be on building a program that is appropriate for UCLA as a public university in the context of Los Angeles as a huge, global and creative city.

We were impressed by Professor D'Aguiar's genuine enthusiasm and experience teaching various writing formats and his open interest in the work being done here at UCLA, and are proud to have him at the head of this effort."

D'Aguiar has written more than a dozen books of fiction and poetry, which have been translated into a dozen languages. His first novel, *The Longest Memory*, won the Whitbread First Novel Award and was made into a film for British television. His essays and poetry have appeared in *The New Yorker*, *Harper's*, *The Guardian*, *Best American Essays* and more. His play, *A Jamaican Airman Foresees His Death*, was produced at the Royal Court Theatre in London. *Continental Shelf*, a U.K. Poetry Book Society Choice, was shortlisted for the U.K.'s T.S. Eliot Prize in 2009. His latest poetry collection is *The Rose of Toulouse*. His latest novel, *Children of Paradise*, was inspired by the events at Jonestown.

D'Aguiar sings the praises of his fellow faculty newcomer, Torres, who has published short fiction in *The New Yorker*, *Harper's*, *Granta*, *Tin House*, *The Washington Post*, *Glimmer Train*, *Flaunt*, and other publications, as well as nonfiction pieces in publications such as *The Guardian* and *The Advocate*. The National Book Foundation named him one of 2012's "5 Under 35."

Torres' first novel, *We the Animals*, was a critical hit and best-seller in 2011. It's also a feat of compact writing to maximum effect, D'Aguiar says.

"It's haunting and memorable and makes you want to write," he said. "I can't wait for him to get here and show students how to leave things out," he joked.

#### More offerings planned

As the department garners further funding for creative writing, other expansions are also in the works, Behdad said. The next



Mona Simpson

step is to build a roster of visiting authors, preferably high-profile writers and poets in the modern publishing sphere. Also on the wish list, Behdad added, is to develop an MFA program.

Behdad said, especially given the location of UCLA, many students are eager to study creative writing in hopes of launching into the entertainment industry.

D'Aguiar and Simpson see great potential in an introductory class that closely examines the evolution of a book to film, inviting opportunities for students to learn basic skills in the formulas of fiction, drama and poetry as related to the film industry.

This is just one idea for the class D'Aguiar and Simpson are considering, which they're hoping will be a large-scale survey course, potentially accommodating several hundred students. Under the current campus model, the largest creative writing classes can hold only 40 to 45 students. And seminars are limited to a dozen or fewer.

"I'm hoping the diversity of our student population will be reflected in and feed the work that comes out of the class," D'Aguiar said. "I'm excited about the diverse demographic mix of Los Angeles, how it looks as a visual map of culture. If a course at UCLA can resemble that map, it's very exciting."

# New Method to Identify Disease Markers Is an Important Step Toward Precision Medicine

By Stuart Wolpert

## UCLA LIFE SCIENTISTS HAVE CREATED AN ACCURATE NEW METHOD TO IDENTIFY MARKERS FOR MANY DISEASES — A SIGNIFICANT STEP TOWARD A NEW ERA OF PERSONALIZED MEDICINE, TAILORED TO EACH PERSON’S DNA AND RNA.

The powerful method, called GIREMI (pronounced Gir-REMY), will help scientists to inexpensively identify genetic mutations and SNPs (single nucleotide polymorphisms) — tiny variations in a genetic sequence that can produce large consequences, and can be used to diagnose and predict the risk of disease.

Xinshu (Grace) Xiao, senior author of the research and a UCLA associate professor of integrative biology and physiology in the UCLA College, is making the software available on her website at <http://www.physci.ucla.edu/research/xiao/>, where anyone can download it for free. Details of the method were published in the journal *Nature Methods*. The research was federally funded by the National Institutes of Health and the National Science Foundation.

### Potential implications for cancer, schizophrenia, autism and more

Genes contain RNA editing sites, which are not yet well understood, but appear to hold clues to many diseases. One might think that whatever is in the DNA we inherited from our parents would eventually be expressed in our proteins, but it turns out there is a modification process, called RNA editing, that can cause cancer, schizophrenia, autism, Alzheimer’s disease, Parkinson’s and many other conditions, Xiao said. This process modifies the chemical bases — called nucleotides, whose patterns carry the data required for constructing proteins, which provide the components of cells and tissues — in our genetic material. If you had an “A” nucleotide in your DNA, for example, sometimes it may be modified into a “G.”

RNA editing is different from mutations. A mutation is written incorrectly in our genes. In RNA editing, our genetic material is normal, but modifications occur when a gene is expressed.

GIREMI is the most accurate and sensitive method for identifying RNA editing sites, as well as SNPs and mutations in RNA. Differentiating SNPs from RNA editing sites has been very difficult; GIREMI makes it much easier. (Most SNPs appear not to be harmful.)

“We can predict RNA editing sites without sequencing the whole genome,” said Xiao, a member of UCLA’s Institute for Quantitative and Computational Biosciences, Molecular Biology Institute, and Jonsson Comprehensive Cancer Center. “Now you don’t have to spend thousands of dollars sequencing the DNA; you can sequence only the RNA. Our method will be easily applicable to all the existing RNA data sets, and will help to identify SNPs and mutations at a large cost reduction from current methods.”

RNA editing is at an early stage. “We are trying to discover as many editing sites as possible,” Xiao said. “This method can be easily applied to any RNA sequencing data sets to discover new RNA editing sites that are specific to a certain disease.”

Xiao’s research group is working to apply GIREMI to many diseases. Xiao and UCLA postdoctoral scholar Qing Zhang conducted one year of research in Xiao’s laboratory designing GIREMI.

The brain has many RNA editing sites, Xiao and Zhang found, indicating RNA editing is involved in brain function and

neurological disorders. There are more than 10,000 RNA editing sites in the brain, probably many more, Xiao said.

### Moving toward personalized medicine

People have “abundant differences” in RNA editing sites. Studying 93 people whose genomes have been determined, Xiao and Zhang found that people are unique in the RNA editing sites in their immune system’s B cells, which protect us from disease by producing antibodies, or “smart bullets.”

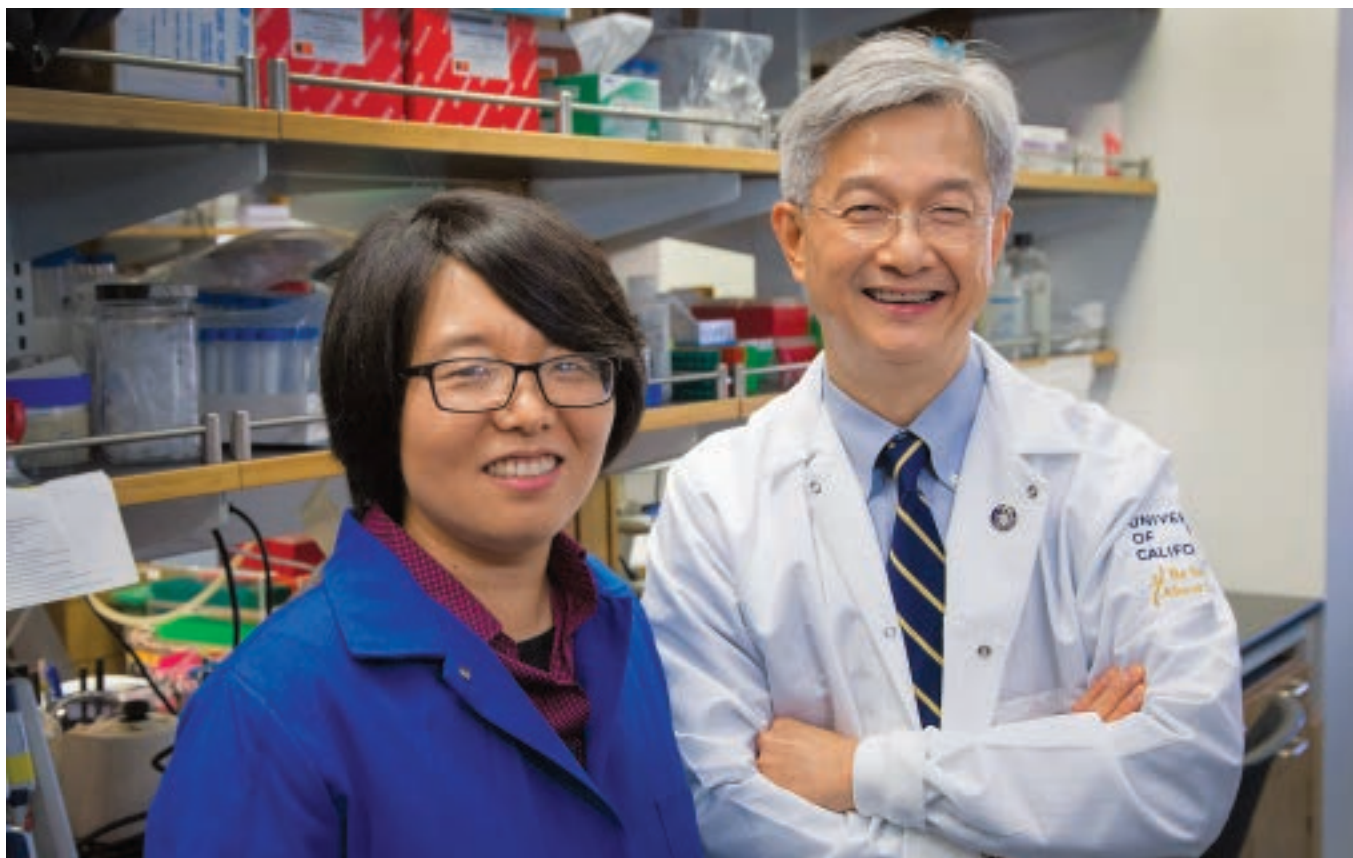
“Every individual has some differences in these cells,” Xiao said.

President Obama’s budget contains a proposal to transform the practice of medicine by encouraging doctors to design individually tailored treatments based on genetic and molecular differences — an approach called personalized medicine or precision medicine. He said the promise of precision medicine is “delivering the right treatment at the right time, every time, to the right person.”

RNA, widely known as a cellular messenger that makes proteins and carries out DNA’s instructions to other parts of the cell, is now understood to perform sophisticated chemical reactions and is believed to perform an extraordinary number of other functions, at least some of which are unknown.

### ‘Treasure in saliva’ may reveal deadly diseases early enough to treat them

Research that Xiao published in the fall of last year may lead to a simple saliva test to diagnose at an early stage serious and life-threatening diseases such as Type



UCLA associate professor Xinshu (Grace) Xiao collaborated with Dr. David Wong, associate dean in the UCLA School of Dentistry, on research that may lead to a simple saliva test to diagnose at an early stage serious and life-threatening diseases such as Type II diabetes, pre-diabetes, oral cancer, pancreatic cancer, gastric cancer and perhaps neurological disorders and autoimmune diseases. Photo: Reed Hutchinson/UCLA

II diabetes, pre-diabetes, oral cancer, pancreatic cancer, gastric cancer and perhaps neurological disorders and autoimmune diseases.

The research, the most comprehensive analysis of RNA molecules in human saliva ever conducted, reveals that saliva is no different from blood in containing important biomarkers for disease.

“If we can define the boundaries of molecular targets in saliva, then we can ask what the constituents in saliva are that can mark someone who has pre-diabetes or the early stages of oral cancer or pancreatic cancer, and can utilize this knowledge for personalized medicine,” said co-author Dr. David Wong, the Felix and Mildred Yip Endowed Professor in Dentistry, and UCLA School of Dentistry’s associate dean of research. The research was published in the journal *Clinical Chemistry*.

Wong, who was trained as a cancer geneticist and dentist, has conducted research over the last decade to develop biomarkers in saliva; his laboratory discovered that some of the same RNAs that are inside human cells are also present in saliva and can be used to detect diseases.

There are many forms of RNA, including some very odd ones.

Circular RNA — it wasn’t known until very recently that RNA comes in a circular form, as well as the traditional linear form — is in your saliva, the scientists report in the new research. This research marks the first discovery of circular RNA in saliva or any body fluid, including blood. What these RNA do is mostly unknown, but at least some of them serve as a sponge for tiny RNA molecules called microRNAs, which bind to them.

“Circular RNAs in saliva may be protecting other RNAs,” and it is a “very attractive hypothesis” that in saliva they protect microRNAs from being degraded, Xiao said.

### 327 forms of circular RNAs newly identified

The scientists have identified more than 400 circular RNAs in human saliva, including 327 forms that were previously unknown.

MicroRNAs, which once seemed to be little more than molecular noise, containing only about 20 chemical units called nucleotides, play important roles in many

cell types, and have been implicated in cancers and other diseases, Xiao said. They regulate other genes; one microRNA can regulate hundreds of genes, she said.

The scientists compared microRNA levels in saliva to those in the blood and other body fluids, and found the microRNA level in blood and in saliva are very similar — which indicates a saliva sample would be a good measure of microRNAs in your body.

The scientists used state-of-the-science genomics and bioinformatics in the research. They analyzed 165 million genetic sequences.

Co-authors of the research are UCLA postdoctoral scholars Jae Hoon Bahn and Qing Zhang in Xiao’s laboratory; Feng Li, assistant researcher in Wong’s laboratory; Tak-Ming Chan, a former postdoctoral scholar in Xiao’s laboratory; Xianzhi Lin, a postdoctoral scholar in Xiao’s laboratory; and Yong Kim, a UCLA adjunct associate professor of dentistry.

The research was supported by the National Center for Advancing Translational Sciences of the National Institutes of Health.

# UCLA Physicists Determine the Three-Dimensional Positions of Individual Atoms for the First Time

By Katherine Kornei

**ATOMS ARE THE BUILDING BLOCKS OF ALL MATTER ON EARTH, AND THE PATTERNS IN WHICH THEY ARE ARRANGED DICTATE HOW STRONG, CONDUCTIVE OR FLEXIBLE A MATERIAL WILL BE. NOW, SCIENTISTS AT UCLA HAVE USED A POWERFUL MICROSCOPE TO IMAGE THE THREE-DIMENSIONAL POSITIONS OF INDIVIDUAL ATOMS TO A PRECISION OF 19 TRILLIONTHS OF A METER, WHICH IS SEVERAL TIMES SMALLER THAN A HYDROGEN ATOM.**

Their observations make it possible, for the first time, to infer the macroscopic properties of materials based on their structural arrangements of atoms, which will guide how scientists and engineers build aircraft components, for example. The research, led by Jianwei (John) Miao, a UCLA professor of physics and astronomy and a member of UCLA's California NanoSystems Institute, was published in the journal *Nature Materials*.

For more than 100 years, researchers have inferred how atoms are arranged in three-dimensional space using a technique called X-ray crystallography, which involves

measuring how light waves scatter off of a crystal. However, X-ray crystallography only yields information about the average positions of many billions of atoms in the crystal, and not about individual atoms' precise coordinates.

"It's like taking an average of people on Earth," Miao said. "Most people have a head, two eyes, a nose and two ears. But an image of the average person will still look different from you and me."

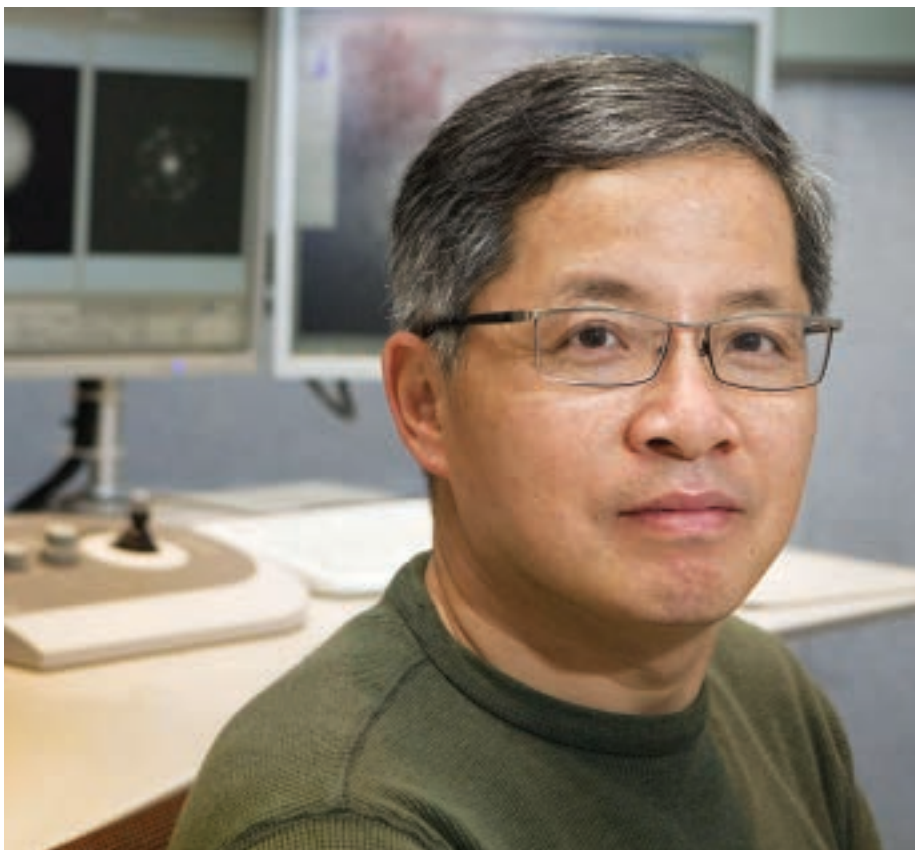
## Broad applications for science and technology

Because X-ray crystallography doesn't reveal the structure of a material on a per-atom basis, the technique can't identify tiny imperfections in materials such as the absence of a single atom. These imperfections, known as point defects, can weaken materials, which can be dangerous when the materials are components of machines like jet engines.

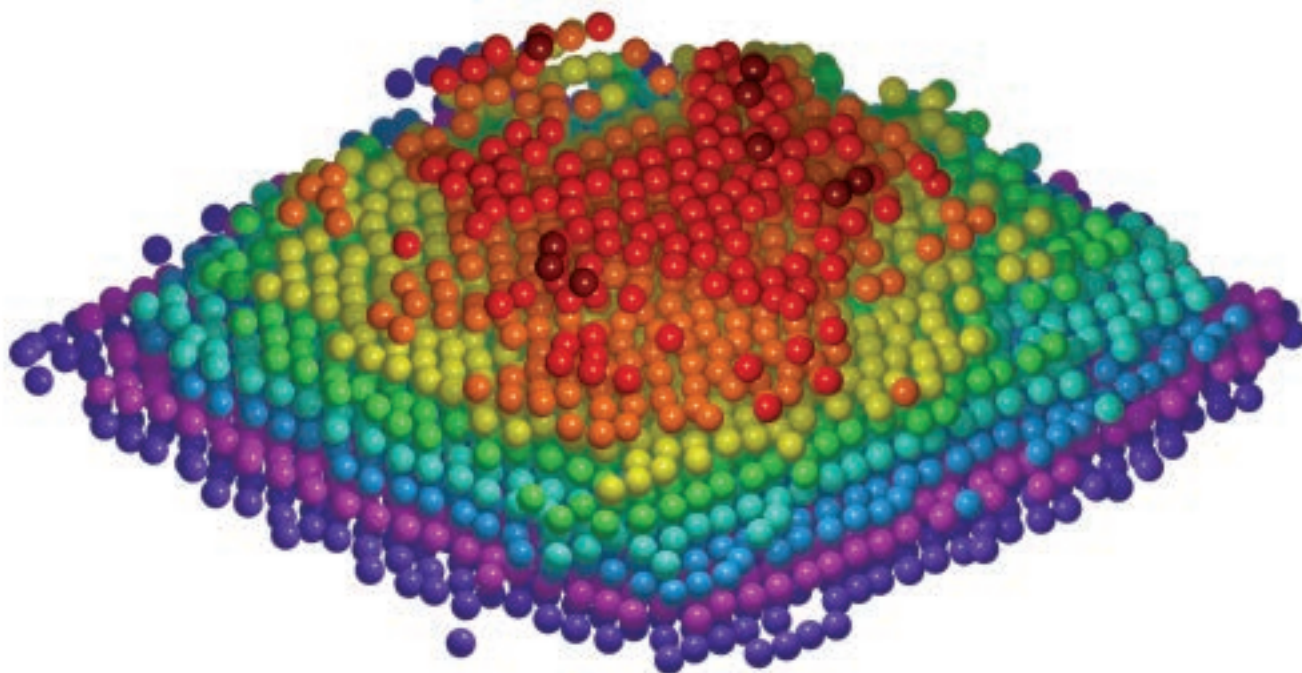
"Point defects are very important to modern science and technology," Miao said.

Miao and his team used a technique known as scanning transmission electron microscopy, in which a beam of electrons smaller than the size of a hydrogen atom is scanned over a sample and measures how many electrons interact with the atoms at each scan position. The method reveals the atomic structure of materials because different arrangements of atoms cause electrons to interact in different ways.

However, scanning transmission electron microscopes only produce two-dimensional images. So creating a 3-D picture requires scientists to scan the sample once, tilt it by a few degrees and re-scan it — repeating the process until the desired spatial resolution is achieved — before combining the data from each scan using a computer algorithm. The downside of this technique is that the repeated electron beam radiation can progressively damage the sample.



Jianwei (John) Miao



The 3-D coordinates of thousands of individual atoms and a point defect in a material were determined with a precision of 19 trillionths of a meter, where the crystallinity of the material is not assumed. The figure shows the measured 3-D atomic positions of a tungsten tip, consisting of nine atomic layers, labeled with crimson (dark red), red, orange, yellow, green, cyan, blue, magenta and purple from layers one (top) to nine (bottom), respectively. Courtesy of Mary Scott and Jianwei (John) Miao/UCLA

### How to assemble a 3-D model of 3,769 atoms

Using a scanning transmission electron microscope at the Lawrence Berkeley National Laboratory's Molecular Foundry, Miao and his colleagues analyzed a small piece of tungsten, an element used in incandescent light bulbs. As the sample was tilted 62 times, the researchers were able to slowly assemble a 3-D model of 3,769 atoms in the tip of the tungsten sample. The experiment was time-consuming because the researchers had to wait several minutes after each tilt for the setup to stabilize.

"Our measurements are so precise, and any vibrations — like a person walking by — can affect what we measure," said Peter Ercius, a staff scientist at Lawrence Berkeley National Laboratory and an author of the paper.

The researchers compared the images from the first and last scans to verify that the tungsten had not been damaged by the radiation, thanks to the electron beam energy being kept below the radiation damage threshold of tungsten.

Miao and his team showed that the atoms in the tip of the tungsten sample were arranged in nine layers, the sixth of which contained a point defect. The researchers believe the defect was either a hole in an otherwise filled layer of atoms or one or more interloping atoms of a lighter element such as carbon.

Regardless of the nature of the point defect, the researchers' ability to detect its presence is significant, demonstrating for the first time that the coordinates of individual atoms and point defects can be recorded in three dimensions.

"We made a big breakthrough," Miao said.

### Next up: Magnetism or energy storage at the atomic level

Miao and his team plan to build on their results by studying how atoms are arranged in materials that possess magnetism or energy storage functions, which will help inform our understanding of the properties of these important materials at the most fundamental scale.

"I think this work will create a paradigm shift in how materials are characterized in the 21st century," Miao said. "Point defects strongly influence a material's properties and are discussed in many physics and materials science textbooks. Our results are the first experimental determination of a point defect inside a material in three dimensions."

The study's co-authors include Rui Xu, Chien-Chun Chen, Li Wu, Mary Scott, Matthias Bartels, Yongsoo Yang and Michael Sawaya, of UCLA; Colin Ophus of Lawrence Berkeley National Laboratory; Hadi Ramezani-Dakheel and Hendrik Heinz of the University of Akron; Wolfgang Theis of the University of Birmingham; and Laurence Marks of Northwestern University.

This work was primarily supported by the U.S. Department of Energy's Office of Basic Energy Sciences.

# THE UCLA COLLEGE IN SPACE

UCLA PHYSICAL SCIENCES FACULTY HAVE LONG EXPLORED NEW FRONTIERS, FROM THE EARTH'S UPPER ATMOSPHERE TO THE FAR REACHES OF THE KNOWN UNIVERSE, AND ALONG THE WAY HAVE INSPIRED ALUMNI TO GO INTO SPACE.

## MERCURY

### MERCURY

David Paige discovered evidence of water and ice deposits on Mercury and the moon.

### CERES

Christopher Russell is the principal investigator on the Dawn mission, the first mission to achieve orbit around a dwarf planet, Ceres; Dawn also orbited the asteroid Vesta.

Edward Wright works on cosmology and infrared astronomy in the search for Near Earth Objects.

### NORTHERN LIGHTS

Toshi Nishimura and Larry Lyons discovered that when vast curtains of aurora borealis collide, they produce spectacular outbursts of light that can threaten man-made assets in space and on the ground.

## EARTH



### ASTRONAUTS: COLLEGE ALUMNI IN SPACE

**Walt Cunningham** B.S. '60, M.S. '61  
Mission: Apollo 7, 1963

**Anna Lee Fisher** B.S. '71, M.S. '87  
Mission: STS-51-A (Discovery), 1984

**Taylor Wang** B.S. '67, M.S. '68, Ph.D. '71  
Mission: STS-51-B (Challenger), 1985

**John Phillips** M.S. '84, Ph.D. '87  
Mission: STS-100, 2001, Soyuz TMA-6 (Expedition 11), 2005, STS-119, 2009

### SUPERNEBULA

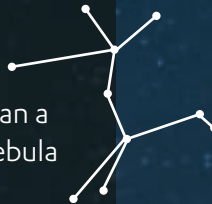
Jean Turner discovered that more than a million stars are forming in a supernebula in NGC 5253 in the constellation Centaurus.

### VAN ALLEN RADIATION BELT

Yuri Shprits discovered the zebra-like structure of plasma waves in the Van Allen radiation belts that surround the Earth.

### SATELLITE

Vassilis Angelopoulos is the principal investigator on NASA's THEMIS and ARTEMIS missions, and advises the student-run ELFIN project, UCLA's first fully built satellite. His team discovered the source of space weather near Earth.



## JUPITER

### GALAXY

Andrea Ghez, who leads the UCLA Galactic Center Group, proved the existence of a supermassive black hole at the center of the Milky Way galaxy.

Ian McLean and James Larkin head up UCLA's Infrared Lab, which has built some of the world's most sophisticated adaptive optics instruments, including MOSFIRE, a "time machine" that allows astronomers to study the earliest galaxies in the universe.

Alice Shapley is conducting a survey of the early universe using MOSFIRE to determine how galaxies form and evolve over cosmic time.

### SOLAR WIND

Kevin McKeegan leads the MegaSims lab, which analyzes samples of captured solar wind from the GENESIS mission to better understand the isotopic composition of solar oxygen.

### EXTRATERRESTRIAL INTELLIGENCE

Jean-Luc Margot leads UCLA's Search for Extraterrestrial Intelligence (SETI) Group, which studies the formation and evolution of habitable worlds.



### GANYMEDE

Margaret Kivelson discovered a magnetic field at Jupiter's largest moon Ganymede, providing evidence of an ocean on its sister moon Europa. She is co-investigator on THEMIS and Cassini.

### EXOPLANET

Mike Fitzgerald is co-investigator on the Gemini Planet Imager project, which is credited with discovering a Jupiter-like planet, 51 Eridani b.

### KUIPER BELT

David Jewitt discovered the Kuiper Belt, a region of the solar system between Neptune and the sun.

### SUPERNOVA

Tommaso Treu discovered the first distant star exploding into a supernova.

### MARS

David Paige has been selected to design and run the Radar Imager for Mars' Subsurface Exploration (RIMFAX), as part of NASA's Mars 2020 mission.

An Yin proposed plate tectonics on Mars.

## MARS

# Predictive Policing Substantially Reduces Crime in Los Angeles During Months-Long Test

By Stuart Wolpert

**CAN MATH HELP KEEP OUR STREETS SAFER? A NEW STUDY BY A UCLA-LED TEAM OF SCHOLARS AND LAW ENFORCEMENT OFFICIALS SUGGESTS THE ANSWER IS YES. A MATHEMATICAL MODEL THEY DEvised TO GUIDE WHERE THE LOS ANGELES POLICE DEPARTMENT SHOULD DEPLOY OFFICERS LED TO SUBSTANTIALLY LOWER CRIME RATES DURING A 21-MONTH PERIOD.**

“Not only did the model predict twice as much crime as trained crime analysts predicted, but it also prevented twice as much crime,” said Jeffrey Brantingham, a UCLA professor of anthropology and senior author of the study. A paper about the work, which was also tested in Kent, England, was published in the *Journal of the American Statistical Association*.

The model was so successful that the LAPD has adopted it for use in 14 of its 21 divisions, up from three in 2013.

Developed using six years of mathematical research and a decade of police crime data, the program predicts times and places that serious crimes will occur based on historical crime data in a given area. A key to its success, Brantingham said, is that the algorithm behind the model effectively “learns” over time.

“In much the same way that your video streaming service knows what movie you’re going to watch tomorrow, even if your tastes have changed, our algorithm is constantly evolving and adapting to new crime data,” he said.

## Testing: Mathematical model vs. human crime analysts

Beginning in 2011, the researchers analyzed crime trends in the LAPD’s Southwest division and in two Kent divisions to determine whether their model could predict, in real time, when and where major crimes would occur. Their analysis in Los Angeles focused on burglaries, theft from cars and theft of cars. In Kent, they studied patterns for those crimes as well as violent crimes including assault and robbery.

The researchers tested the computer model by pitting it against professional crime analysts, seeing which could more accurately predict where crimes would occur. On each of 117 days in Los Angeles, they gave the human analysts a map of the entire police district and asked them to identify one precise location — only about half-a-block in size — where a crime would be most likely to occur within a specific 12-hour period. The algorithm was programmed to answer the same question. (In this phase, police officers did not act on the model’s predictions.)

In Los Angeles, the mathematical model correctly predicted the locations of crimes on 4.7 percent of its forecasts, while the human analysts were correct just 2.1 percent of the time. In Kent’s two divisions, the model predicted 9.8 percent and 6.8 percent of the crimes; the analysts were correct 6.8 percent and 4 percent of the time. (Although those success rates might not appear to be dramatic, it’s important to note that the predictions were focused on minuscule target locations: The predicted hot spots represented less than 1 percent of Los Angeles’ land area, and an even smaller percentage of Kent.)

## From the lab to the streets

In the next phase of the study, police officers in each of three LAPD divisions — North Hollywood, Southwest and Foothill (in the northeastern San Fernando Valley) — were deployed to 20 half-block areas based on the predictions of either the model or the human analysts, on random days for between four and eight months. Neither the officers nor their commanders knew whether the assignments came from the computer or the professional analysts.

Officers were instructed to go to the specified areas, which were marked on maps as red boxes, to respond as they saw



Jeffrey Brantingham





Police officers in each of three LAPD divisions were deployed to 20 half-block areas based on predictions by the mathematical model and the human analysts.

fit and to stay in the locations as long as they deemed necessary. Across the three divisions, the mathematical model produced 4.3 fewer crimes per week, a reduction of 7.4 percent, compared with the number of crimes that the police would have expected had officers not patrolled the “red box” areas. Crime was reduced when officers patrolled the areas selected by the human analysts as well, but only by two crimes per week in each division.

#### **Huge cost savings associated with reductions in crime**

Based on those results, the researchers estimated that using the algorithm would save \$9 million per year in Los Angeles, taking into account costs to victims, the courts and society.

Brantingham said the mathematical model’s success rate could be improved even further as the researchers enhance the algorithm it uses.

Based on its test run, the Kent police now are rolling out the mathematical model to other divisions throughout the county.

“We have worked closely with counterparts in Los Angeles for the moment we became interested in predictive policing and the benefits it brings to keeping communities safe,” said Mark Johnson, head of analysis for the Kent police.

Brantingham thinks the mathematical model would be effective in cities worldwide. He is a co-founder of PredPol, a company that markets predictive policing software to cities including Atlanta and Tacoma, Wash.

Brantingham also emphasized that the algorithm cannot replace police work; it’s intended to help police officers do their jobs better.

“Our directive to officers was to ‘get in the box’ and use their training and experience to police what they see,” said Cmdr. Sean Malinowski, the LAPD’s chief of staff. “Flexibility in how to use predictions proved to be popular and has become a key part of how the LAPD deploys predictive policing today.”

Many social scientists have said human behavior and criminal behavior are too complex to be explained with a

mathematical model, but Brantingham strongly disagrees.

“It’s not too complex,” he said. “We’re not trying to explain everything, but there are many aspects of human behavior that we can understand mathematically.”

Other co-authors are Andrea Bertozzi, UCLA professor of mathematics and director of applied mathematics; George Mohler, a former UCLA mathematics postdoctoral scholar; Martin B. Short, a former UCLA assistant adjunct professor of mathematics, who is currently an assistant professor at the Georgia Institute of Technology; and George Tita, an associate professor at UC Irvine.

The research was funded by the National Science Foundation, the Air Force Office of Scientific Research, Office of Naval Research and the Army Research Office.

#### **Learn more:**

Watch a video about predictive policing from the National Science Foundation at [https://youtu.be/U0gX\\_z0V0nE](https://youtu.be/U0gX_z0V0nE).

# Famed UCLA Fiat Lux Seminars to Offer Courses on University's 100-Year History

By Jean-Paul Renaud

**STARTING THIS WINTER AND THROUGH UCLA'S CENTENNIAL ANNIVERSARY IN 2019, FRESHMEN WILL HAVE THE CHANCE TO DIVE INTO THE UNIVERSITY'S RICH HISTORY THROUGH A SERIES OF FIAT LUX SEMINARS DESIGNED TO EXPLORE VARIOUS ASPECTS OF THE INSTITUTION'S FOUNDING AND GROWTH.**

Coordinated by the UCLA College's Division of Undergraduate Education, the Fiat Lux Freshman Seminar Program provides students and faculty with small group settings to engage in meaningful discussions on a range of topics. They were first conceived in 2001 to give students an academic context for the events of September 11, and since then have evolved to cover a spectrum of topics. Students receive one unit of academic credit and faculty members from across campus have the opportunity to share with undergraduates their areas of intellectual passion and expertise.

Throughout the years, Fiat Lux course topics have ranged from *Meditation for*

*College Students to Jack the Ripper: Unsolved Murders in Whitechapel, Parasites: Eating Us Alive and Boots to Bruins: From Combat to Campus Life.* Now, similarly focused courses, and equally passionate and distinguished faculty members, will hold Centennial Seminars on a broad range of topics related to UCLA and to those who have contributed to its success.

"When you look at all of the individuals who have really made our world a better place, from the students to the faculty to the alumni, UCLA has some significant people," said Dean and Vice Provost of Undergraduate Education Patricia Turner, who first came up with the idea of the Centennial Seminars. "Over the past 100 years, we have had

individuals of enormous impact who can do the eight-clap. These seminars will add another dimension to school spirit."

## **Seminar on the life and times of Arthur Ashe '66**

Several faculty members have signed up to teach these winter quarter seminars, which range from humanities to social sciences. Among them is Turner herself, who is an expert on tennis legend and UCLA alumnus Arthur Ashe. Her seminar, "Arthur Ashe and the Second Half of the 20th Century," will focus on the tennis player's life and its parallels to the events that shaped contemporary history.

"His life intersects several key moments of the second half of the 20th century," she said. "Ashe came to UCLA with the backdrop of the civil rights movement and segregation and later became involved in the anti-apartheid movement in South Africa and of course as an activist for HIV/AIDS awareness."

Other seminars to be offered include "Los Angeles Architecture and Ethnicity," taught by history professor Teofilo Ruiz, and "Exploring the Trees of UCLA," taught by Victoria Sork, dean of UCLA Life Sciences and a professor in the Department of Ecology and Evolutionary Biology.

## **UCLA's ecosystem inspires a seminar**

"The landscape of UCLA is part of its history," Sork said. "The founders intended the campus to serve as an urban arboretum."

Sork plans to take her class through various landscapes across UCLA, including the Mildred E. Mathias Botanical Garden, home to more than 3,000 plant species, and to the northwest corner of the 400-acre campus, where the original chaparral



Professor Bhagwan Chowdhry from the UCLA Anderson School of Management leads a Fiat Lux seminar. Through Fiat Lux, students have access to seminars from faculty across campus, including those from UCLA's professional schools.



Teofilo Ruiz, distinguished professor in the Department of History and holder of the Peter H. Reill Term Chair in European History, teaches a Fiat Lux seminar.

species that coated the landscape a century ago still can be found.

Even Chancellor Gene Block, who regularly teaches Fiat Lux courses, will participate in the Centennial Seminars.

UCLA's centennial anniversary in 2019 will coincide with the end of a \$4.3 billion fundraising campaign meant to carry the university into its second century. Turner has identified the Fiat Lux program as a campaign priority and hopes to secure a philanthropic endowment to ensure its future.

"I can think of no more fitting time to invite the faculty to develop and teach under the UCLA Centennial Seminar banner," Turner said.

#### Learn more:

For a complete list of courses and more background on the Fiat Lux program, please visit <http://www.uei.ucla.edu/fiatlux.htm>.

**FIAT LUX  
SINCE 2001:**

**40,754**

**ENROLLED**

(80% are freshmen)

**2,608**

*seminars*

**2,217**

*faculty members*

### PAST FIAT LUX SEMINARS

- *Secrets of the Northern Lights: Earth's Aurora*
- *Art + Science Dialogues*
- *Making of Folk Hero in Hip-Hop Culture*
- *Love, Violence and Courtliness in Medieval Romance and Epic*

# Propelling the Groundbreakers and the Game Changers

Eleven new endowed faculty chairs established in less than two years

By Margaret MacDonald

**A GROUNDSWELL OF PHILANTHROPIC SUPPORT HAS RESULTED IN 11 NEW ENDOWED FACULTY CHAIRS IN THE UCLA COLLEGE SINCE THE PUBLIC LAUNCH OF THE CENTENNIAL CAMPAIGN IN MAY 2014. THIS BUMPER CROP OF ENDOWED CHAIRS HAS STRENGTHENED EFFORTS TO ATTRACT AND RETAIN GAME-CHANGING, GROUNDBREAKING FACULTY.**

Ever since UCLA's first endowed chair was created in 1928 by Mr. and Mrs. C. N. Flint, private donors have generously supported the research and teaching of distinguished faculty in the College. Highly coveted in the academic world, endowed chairs recognize exceptional faculty members for their past and potential scholarly contributions while also providing dedicated funds for the chair



Janet Napolitano

holder's research. At a public research university like UCLA, they are a particularly important recruiting tool.

UCLA Chancellor Gene Block said, "Today more than ever, endowed chairs are vital to UCLA's continued research and teaching excellence. This form of philanthropic support levels the playing field and allows us to compete with other top-tier universities in hiring the best faculty."

Noting the ripple effect of endowed chairs, senior dean of the UCLA College Joseph Rudnick said, "World-class faculty members attract the most talented graduate and undergraduate students, who in turn go on to make their own imprint on the world."

### Matching funds from the University of California

A big boost to endowed chairs in the College came in July 2014 when University of California President Janet Napolitano

announced the Presidential Match for Endowed Chairs, designed to spur private giving to UC. Several donors stepped up to meet the match, resulting in four new presidential endowed chairs in the divisions of Humanities, Life Sciences, Physical Sciences and Social Sciences.

The recent additions to the College's list of 93 endowed chairs span areas as diverse as theoretical physics, literary studies, vertebrate biology and world history, and include a chair devoted to innovative teaching in the Division of Undergraduate Education.

Donors who established endowed chairs were motivated by the desire to leave a lasting, impactful legacy and ensure the future excellence of one of the world's great public universities.

Distinguished Professor of Psychology and Political Science David Sears, who established the David O. Sears Presidential



David Sears



Mani Bhaumik



Keith and Cecilia Terasaki

Endowed Chair in the Division of Social Sciences, said, “I know that competing with private universities for the best faculty is a challenge. I feel it is necessary for those of us who value public higher education to step up if we can.”

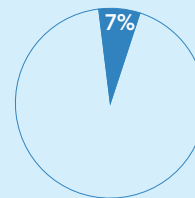
Mani Bhaumik, a physicist, author and entrepreneur who established the Mani L. Bhaumik Presidential Endowed Chair in Theoretical Physics, said, “As a scientist, I realize the importance of supporting faculty who do basic research, especially theoretical physics that is at the foundation of all sciences.”

Rudnick expressed gratitude for the generosity and foresight of those who have established endowed chairs.

“They understand that endowed chairs are an investment not only in the intellectual fabric of UCLA but in future generations and future discoveries.”

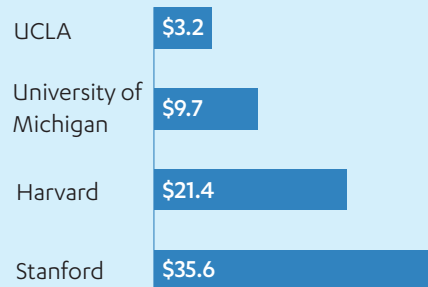
**For more information** about how you can support faculty in the College, please contact Megan Kissinger at (310) 206-0667 or [mkissinger@support.ucla.edu](mailto:mkissinger@support.ucla.edu).

### CLOSING THE ENDOWMENT GAP



Although UCLA is a public institution, just 7 percent of the university's total budget is paid for through the state's general fund.

UCLA's overall endowment — that is, donations invested for current and future use — lags behind both private and public top-tier research universities. UCLA is relying on private philanthropy to close that gap.



\*In billions, as of June 2014

### ENDOWED CHAIRS ESTABLISHED IN THE COLLEGE SINCE THE LAUNCH OF THE CENTENNIAL CAMPAIGN IN MAY 2014:

Mani L. Bhaumik Presidential Endowed Chair in Theoretical Physics

Presidential Professor of Philosophy (Division of Humanities)

Donald R. Dickey Chair in Vertebrate Biology

David O. Sears Presidential Endowed Chair in the Division of Social Sciences

Marcia H. Howard Term Chair in Literary Studies

Judith L. Smith Term Chair in the Division of Undergraduate Education

Ibn Khaldun Endowed Chair in World History

Keith and Cecilia Terasaki Presidential Endowed Chair in the Division of Life Sciences

Lore and Gerald Cunard Chair in the UCLA/Getty Conservation Program\*

Scott Waugh Endowed Chair in the Division of Social Sciences

Morrison Family Endowed Chair in Microbiology, Immunology and Molecular Genetics

\*In the original version of the article, the Cunard chair was inadvertently omitted from this list.

## Crowning 60 Years of Support and Advocacy

UCLA alumna funds term chair awarded to environmental humanities scholar

By Margaret MacDonald

**MARCIA HOWARD '54 CONSIDERS UCLA HER SECOND HOME – NO GREAT SURPRISE GIVEN THAT 20 CAMPUS COMMITTEES AND ORGANIZATIONS HAVE BENEFITED FROM HER LEADERSHIP, ADVOCACY AND PHILANTHROPY FOR MORE THAN 60 YEARS. MOST RECENTLY, SHE CONTRIBUTED A LEAD CAMPAIGN GIFT OF \$1 MILLION TO ESTABLISH THE MARCIA H. HOWARD TERM CHAIR IN LITERARY STUDIES – WITH A PREFERENCE GIVEN TO ENVIRONMENTAL HUMANITIES OR SHAKESPEARE STUDIES – IN THE ENGLISH DEPARTMENT. THE INAUGURAL HOLDER OF THE HOWARD CHAIR IS ENGLISH PROFESSOR URSULA K. HEISE, WHO HOLDS A JOINT APPOINTMENT IN UCLA'S INSTITUTE OF THE ENVIRONMENT AND SUSTAINABILITY.**

A retired insurance broker, Howard is a member of the Dean's Centennial Campaign Steering Committee and past recipient of the Alumni Association's University Service Award. In addition to the humanities, she has supported many other units and initiatives on campus, and she underwrites an annual faculty recognition event for the Fiat Lux undergraduate seminar program.

But it is her fervent belief in the importance of a humanities education that compelled her to endow a chair in the English department.

"The study of humanities is essential to all aspects of life," Howard said. "It teaches us to think, reason, write, and explore the meaning of what it is to be human."

Dean of Humanities David Schaberg said, "We are incredibly fortunate to have in



Marcia Howard, left, established the Marcia H. Howard Term Chair in Literary Studies. Ursula Heise, a renowned scholar in environmental humanities, is the first to hold the chair. Photo: Alyssa Bierce

Marcia Howard such a vocal and passionate advocate for the humanities. Her recent gift has highlighted the importance of endowed chairs, which recognize the work of our most distinguished faculty."

### Longtime love of UCLA

A native Angeleno, Howard made frequent childhood visits with her family to UCLA from their home in west Los Angeles. In particular, she recalls building a snowman in the main quad after a rare snowfall. Much later, as an undergraduate, Howard was involved in several campus organizations

including the homecoming and junior prom committees. She worked closely with Bill Ackerman, head of Associated Students from 1933 to 1967 and for whom Ackerman Union is named, who used to joke that she "majored in activities."

Howard studied at the Center for European Studies in Strasbourg, France, during her junior year, igniting a lifelong love of travel and European history and literature. After graduating with a B.A. in history, she resisted her mother's advice to go into teaching and worked as an activist in Georgia in the budding civil rights

movement. Returning to Los Angeles in 1961, she found a job at an insurance company where she not only discovered her vocation but also met her future husband, Herbert, with whom she spent many happy years until he passed away in 2007.

### Professor Heise awarded inaugural chair

Howard was gratified to learn that Heise, a renowned scholar in environmental humanities, would be the first to hold the chair. Environmental humanities is an emerging interdisciplinary field that brings together anthropologists, philosophers, geographers, literary scholars, historians, and new media scholars to study the influence of cultures on how we define nature. The field prepares graduates for a variety of careers including museum work, civic engagement, community organizing, nature education, literacy education, advocacy, business, writing, and the arts.

Heise received a Guggenheim Fellowship in 2011 and is past president of the Association for the Study of Literature and the Environment. Her research and teaching focus on contemporary environmental culture, literature and art in the Americas, Western Europe and Japan; theories of modernization and globalization; literature and science; and the digital humanities.

Heise, who currently works on stories and images of endangered species in different countries, said, “You cannot even begin to think about these issues without knowing something about the sciences. In addition, you often have to know about certain social sciences and about the legal, governmental and historical dimensions that frame our concerns with endangered species. But the narratives are crucial: In the end, biodiversity conservation comes down to values, ideas and stories we tell about what animals and plants we want around, and which ones we’d rather do without.”

### Bringing literary scholarship to environmental discussions

According to English department chair Ali Behdad, literary scholars have until recently been left out of the debate regarding the environment, a field dominated by scientists.

“I believe that literary scholars like Ursula have a lot to contribute by educating citizens to make better decisions in an era of rapid environmental and social changes,” Behdad said. “We are grateful to Marcia Howard for helping us to increase the visibility and impact of this important field.”

Since joining the faculty in 2012, Heise has helped UCLA become a leader in the field, capitalizing on its location in a city marked by dense and diverse populations as well as an impressive mix of environments, from a thriving metropolitan region to ocean and desert landscapes and mountain ranges.

“Marcia’s gift is very forward-looking,” Heise said. “I so appreciate her belief in my work, which I hope will help people better understand and appreciate biodiversity and the stories we tell about endangered species.”

For her part, Howard is convinced that faculty like Heise are vital to educating well-informed citizens of the future, and she feels privileged to have been able to make an impact.

Howard’s philosophy is very simple. She said, “By making a gift, you receive a gift, and UCLA has certainly been a great gift to me.”

**For more information** about supporting the Humanities at UCLA, please contact Sarah Murphy at (310) 794-9005 or [smurphy@support.ucla.edu](mailto:smurphy@support.ucla.edu).

### URSULA HEISE’S PUBLICATIONS

*Imagining Extinction: The Cultural Meanings of Endangered Species* (University of Chicago Press, forthcoming 2016)

*Nach der Natur: Das Artensterben und die moderne Kultur [After Nature: Species Extinction and Modern Culture]* (Suhrkamp, 2010)

*Sense of Place and Sense of Planet* (Oxford University Press, 2008)

*The Longman Anthology of World Literature, Volume F: 20th Century*, Co-Editor (Longman, 2003)

*Chronoschisms: Time, Narrative, and Postmodernism* (Cambridge University Press, 1997)



Ursula Heise says a central question in her research — why do we make images and tell stories about endangered and extinct species? — can be represented by the dodo bird, a symbol of extinction in popular culture.

## Class Offers UCLA Students Plenty of Food for Thought and Experiential Learning

By Rebecca Kendall

### FOOD IS SOMETHING THAT FUELS YOUR BODY. BUT HOW OFTEN DO YOU CONSIDER WHERE FOOD COMES FROM, ITS NUTRITIONAL VALUE OR THE FACTORS THAT COMMONLY PREVENT PEOPLE FROM EATING WELL?

UCLA students are learning about food and food justice as part of a new class funded by the UC Global Food Initiative, launched in 2014 as a platform to encourage collaboration among experts from all 10 UC campuses to address some of the world’s most pressing food issues.

“Food is a hot topic right now,” said Kathy O’Byrne, who teaches *Food Studies and Food Justice* and directs UCLA’s Center for Community Learning. “Whether it’s research, policy, waste, marketing, logistics or event planning, or looking at the relationship between government regulation and government assistance around food programs, or the level of hunger, poverty and homeless people in L.A. — these things are interconnected on every level.”

Beyond the classroom, O’Byrne’s students lend a hand at the Venice Family Clinic, MEND, Food Forward, Seeds of Hope and Kindred Spirits Care Farm. By the end of the quarter, each student-intern will have worked 120 hours at one of these sites.

### Community engagement and healthy home cooking

Empowering families through education and culinary inspiration is something that Claudia Varney and other students addressed at the Venice Family Clinic’s new children’s health center in Culver City. The students helped out at cooking classes for low-income and uninsured children and families who use the clinic’s services.

Creating recipes and shopping for ingredients can be tricky, said Varney, a world arts and cultures student.

“All of the ingredients must be available at the market next door,” said Varney, adding that it makes sense to share recipes that use items that are readily available to people in their communities.

Another challenge was coming up with recipes that can feed large and, in some cases, multigenerational families for whom kitchen space and tools may be lacking.

“Because of gentrification in the area, you have really condensed living situations without a full kitchen. They’ll just have a hot plate,” said Varney, who is also a 2015 UC Global Food Initiative Fellow. “What can you make for eight with just a hot plate? What can you use? What can you do with the smallest number of dishes to feed the most people?”

### Digging into community gardens

Jack Cramer, a biology major, interned at Seeds of Hope, a program run by the Episcopal Diocese of Los Angeles that turns vacant church-owned land into community gardens and orchards throughout a six-county area. Not only does the program provide healthy and fresh food, the project helps educate the community about diet, exercise and nutrition.

“Being able to go and see firsthand something you’ve talked about in an intellectual abstract form in the classroom is really cool and far more impactful than a lot of typical learning methods I’ve encountered,” said Cramer, who planted and cared for gardens and trees, helped install an irrigation system for the gardens and assisted with the program’s cooking and nutrition classes.

He and his group have also attended meetings of the L.A. Food Policy Council, adding an extra layer of insight to their learning.

“If you care about social justice issues and equity, the first step to making any change is to see a problem and understand it,” he said. “First and foremost, we need to be aware. That’s the first step to creating social change and hopefully making a difference.”

### Learn more:

Watch a video of students in the field during the inaugural class at <https://youtu.be/qbBCbOr9sf0>.



UCLA senior Claudia Varney leads a cooking class for children at the Venice Family Clinic in Culver City. Varney was one of 20 UCLA students enrolled in the inaugural “Food Studies and Food Justice” class, funded by the UC Global Food Initiative. Photo: John Vande Wege



# UCLA Students on the Front Lines of Israeli-Palestinian Conflict

By Cynthia Lee

**ROBERT JACKSON TRAVELED A TWISTED AND BUMPY ROAD TO LEAVE BEHIND A TROUBLED UPBRINGING IN SOUTH LOS ANGELES. EVENTUALLY IT LED HIM TO UCLA, WHERE HE IS NOW A FOURTH-YEAR STUDENT MAJORING IN AFRICAN AMERICAN STUDIES.**

This summer, Jackson set out on a new road. This one led to places he never dreamed of seeing and people he never imagined meeting: ground zero of the Israeli-Palestinian conflict.

Jackson was one of 10 UCLA students who traveled to the Middle East in July with the Olive Tree Initiative (OTI), a University of California-based organization that promotes understanding through immersion in the history, culture and complexities of the Israeli-Palestinian conflict.

OTI seeks to facilitate conflict resolution by exposing participants to many voices on an issue that has generated tension on college campuses across the country. With nine chapters on college campuses and more than 400 participants nationwide and in the United Kingdom, the initiative does not advocate for one side or the other, but requires that students respect the rights of all to voice their opinions.

## An immersive experience

After months of rigorous academic preparation, candid discussions and reflection on campus, the group from the UCLA chapter of OTI began its journey with stopovers in Washington, D.C., and New York City to speak with diplomats at the State Department, leaders at the White House and the United Nations, and other regional experts before heading to Jordan, Israel and the West Bank to hear from those whose lives are directly impacted by the Israeli-Palestinian conflict.

Jackson, 29, has lived with violence and conflict for much of his life in Los Angeles. “I’ve survived a drive-by and a mugging. I’ve been held at gunpoint several times. So I’ve been through a lot. ... But over there, I will be meeting people who could lose their lives so easily over something I really don’t understand very well. I think that will be life-changing,” Jackson said before the trip.

## On-the-ground perspective

While traveling throughout the Middle East, UCLA students met with government officials, journalists, academics, college students, soldiers and business leaders on both sides of the conflict as well as with representatives of organizations working to find a resolution.

“The kind of access OTI has is very, very special,” said Antonio Sandoval, director of UCLA’s Community Programs Office, who visited the Middle East with OTI earlier this year. During that trip, the



Students on the Olive Tree Initiative trip visit the Temple Mount/Haram al-Sharif in the Old City of Jerusalem. Photo: Christopher Nguyen

UCLA contingent was invited into the compound of the wealthiest industrialist on the West Bank to speak with him. “You go there with an open mind ready for open dialogue and open debate,” Sandoval said. On the front lines of the conflict, the students ate lunch with families living in Palestinian refugee camps, visited an Israeli city that’s been the target of rocket attacks, met bereaved parents from both sides, heard from Israeli soldiers and spoke with members of Palestinian security forces.

The search for a deeper understanding took students to places where they could see, touch and feel the impact of war as they traveled to the Dead Sea, made the Beit She’an Crossing between Israel and Jordan, and visited the Golan Heights, the Syrian and Lebanese borders, Nazareth, Haifa, Galilee, Jerusalem and many other important locations.

Listening to viewpoints across the spectrum and talking with others who hold opposing opinions can be transformative for participants and build leadership qualities, organizers said.

“The term ‘life-changing’ has been used quite a bit by OTI alumni,” said Daniel Wehrenfennig, executive director of the organization.

# In Conversation With J. William Schopf and Jane Shen-Miller

By Margaret MacDonald

**DISTINGUISHED PROFESSOR OF PALEOBIOLOGY J. WILLIAM “BILL” SCHOPF AND HIS WIFE, PLANT BIOLOGIST JANE SHEN-MILLER, BELIEVE EVERYONE SHOULD DO THEIR “LITTLE BIT” TO IMPROVE THE WORLD. THEY HAVE LED BY EXAMPLE WITH A GENEROUS GIFT TO THEIR HOME DEPARTMENT OF EARTH, PLANETARY AND SPACE SCIENCES (EPSS).**

The couple recently established the Endowed EPSS Faculty and Staff Enrichment Fund and the Endowed EPSS Spousal/ Partner Employment Opportunity Fund. The enrichment fund will underwrite monthly events to foster a sense of community in the department, while the employment opportunity fund will help spouses and partners of newly appointed faculty find meaningful employment in their professions.

Schopf, a UCLA faculty member for the past 47 years and founding director of the Center for the Study of Evolution and the Origin of Life, led research that was instrumental in proving that life on Earth existed 3.5 billion years ago, much earlier than previously thought. Shen-Miller, a senior scientist at UCLA since 1979, helped open new avenues of inquiry into the aging process when she co-directed a project to sequence the genome of the long-lived sacred lotus plant. In 2016, she is to be honored as the Outstanding Alumna of her graduate department at Michigan State.

Seven days a week Schopf and Shen-Miller can be found in their labs, situated across the hall from each other on the fifth floor of the Geology Building.

**When did you first know you wanted to be a scientist?**

**JS:** When I was 8, my father told me that my aunt’s work in genetics helped improve crop yields, alleviating the food shortage in wartime China. From then on I wanted to be a farmer, and in college I studied horticulture.

**WS:** Most of the boys in my fourth-grade class wanted to be policemen, firemen or pro football players, but I remember telling

our teacher I wanted to be a professor. I thought of it as a way a person could contribute to society and to knowledge.

**How did you two meet?**

**JS:** We were members of a U.S. scientific delegation to China in the late 1970s. I was asked to translate Bill’s presentation into Chinese, but I became so interested that I interrupted him, in front of 500 people, to ask questions. He was surprised!

**WS:** I said to myself then and there, ‘Now here is someone with a keen mind!’

**What do you do when you hit a brick wall in your research?**

**JS:** Research is full of ups and downs. It took years to find someone interested in sequencing the lotus genome, but I kept at it because I wanted to know how lotus fruit could remain alive for 1,300 years. Eventually, we unlocked a path to help unravel its mysteries.

**Why did you give this gift?**

**WS:** I feel the department should be like a family, where everyone supports each other and feels appreciated. The enrichment fund provides a way to foster this interaction. The second part of the gift is designed to help working partners of newly appointed faculty find new jobs. I hope this idea will eventually catch on all over campus and even UC. It’s small, but we’ve got to start somewhere.

**JS:** The Center for the Study of Evolution and the Origin of Life began as one of Bill’s ‘little ideas.’ For 25 years, the center provided graduate fellowships and hosted a weekly dinner/discussion for an interdisciplinary group of students and faculty from UCLA and other universities.

**WS:** I truly believe a university ought to be a place where people can come together and learn from one another. If we inspire each other, all of us can play a role in helping this be a better world.

**For more information** about supporting the Department of Earth, Planetary and Space Sciences, please contact Brooke Sanders at (310) 794-9045 or bsanders@support.ucla.edu.



PHOTOS: ALYSSA BIERCE

LET  
THERE  
BE **LIVES**  
**CHANGED**



“I GIVE to support graduate students as a way to show my gratitude for their invaluable contribution to research and teaching.”

**ANDY KELLY**

*DISTINGUISHED RESEARCH PROFESSOR  
DEPARTMENT OF ENGLISH*

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The CENTENNIAL Campaign for **UCLA**

# UCLA COLLEGE REPORT

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“FROM PLANETS TO COMETS AND ASTEROIDS,  
FROM BLACK HOLES TO NEBULAS, AND  
FROM TECHNOLOGIES TO ASTRONAUTS,  
THE COLLEGE’S SPACE DISCOVERIES AND  
CONTRIBUTIONS ARE AMONG THE MOST  
NOTABLE IN THE WORLD.”

— Deans of the UCLA College