

Vice Dean's Newsletter

Division of Mathematical and Physical Sciences January 2017—June 2017
College of Letters and Sciences

FROM THE VICE DEAN



Alexandra
Navrotsky

June 30 ended the fourth and final year of my two-year term in the MPS Dean's Office. I am proud to have served you, my colleagues and friends. I learned many things, both scientific and administrative, and enjoyed the experience. Together we accomplished much.

More than 30 faculty have been recruited, including clusters in QMAP, experimental condensed matter physics, and materials chemistry, along with substantial growth in statistics and mathematics, and establishment of shockwave research in EPS. Our diversity has increased substantially. Nevertheless, we still need many more ladder-rank faculty to meet our needs for teaching and hopes for ever-increasing scientific excellence. Though the Chemistry Discovery Complex has been delayed, significant renovations are underway in Chemistry and Physics. Crocker Nuclear Laboratory is now a part of MPS, and our machine shops and computing facilities have been consolidated. The system-wide COSMOS office is now located at UC Davis. The Winston Ko Professorship in Scientific Leadership is fully funded and a search for the first holder is underway. We have greatly improved undergraduate advising and developed a number of new courses, labs and majors. Some progress has been made on classroom and laboratory space for teaching but space and infrastructure still remain major limitations.

We are now embarking on a period of change and uncertainty with the unification of the College of Letters and Science. However this experiment works out, I am confident that MPS will continue to grow and thrive. My own plans are to concentrate on my research, and on building collaborations through NEAT and through a growing international consortium in thermodynamics. I am here to continue helping MPS as a "private citizen."

Thank you for the opportunities, experience and joy you have given me. Finally let me extend heartfelt thanks to our wonderful and hardworking MPS staff, without whom nothing would get done.

DIVISION ACCOMPLISHMENTS



The first MPS Day on Feb. 11 provided an introduction to graduate studies in chemistry, earth and planetary sciences, mathematics, physics and statistics; and an overview of the application process at UC Davis for community college faculty and prospective transfer students. The event was organized by Professor **Mani Tripathi**, Faculty Assistant to the Vice Dean for Academic Affairs, Research & Graduate. Thank you to everyone who contributed their time and expertise to make MPS Day a success. [Watch a video of the event.](#)



Daniel Nocera, a Harvard professor who helped pioneer artificial photosynthesis, discussed sustainability and clean energy on Feb. 9 at the second installment of **The Winston Ko Public Lecture Series: Frontiers in Mathematical and Physical Sciences**. [See photos from the event.](#)



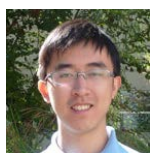
More than 80 students, faculty, and staff attended the latest **Women of MPS** event hosted by the [MPS Advising & Retention Resources](#) unit (MARRs) in May.

More than 1,100 students received advising in the **MARRs** office in the 2016-2017 academic year, a 51 percent increase over the previous year. College-wide enforcement of mandatory advising and the growing number of MPS students drove the increased demand.

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DIVISION, CONTINUED

The [Ambassadors of Mathematical & Physical Sciences \(AMPS\)](#) students launched their MPS Aggie Shadowing Program during spring quarter. The program provides prospective students an opportunity to meet with an AMPS student in their intended major and get a first-hand glimpse of what being an MPS major at UC Davis is like. The spring quarter pilot program was highly successful and the AMPS students plan to run the Shadowing Program throughout the 2017-2018 academic year.



Jilei Yang received the MPS Dean's Graduate Student prize. Yang is a doctoral candidate in statistics who is interested in graphical models, machine learning and statistical modeling for business applications.

The division was awarded \$1 million towards instructional equipment through the [instructional equipment funding program](#), a campus matching program launched this budget year. Many thanks to the departments and division for providing financial support to secure the campus match. The single most expensive piece of equipment is a \$150,000 microwave-assisted plasma-atomic emission spectrometer for the Department of Chemistry. This upgrade in technology will allow faculty to design new experiments that modernize the curriculum and expose students to techniques used in graduate programs and industrial labs.

MPS departments and students were featured on the new UC Davis blog "[What Can I Do With My Major?](#)" The blog helps prospective students learn about college majors and what kinds of careers they can pursue with them.

The Howard Hughes Medical Institute [awarded a grant of \\$1 million](#) to UC Davis to create a more inclusive educational environment. Professor **Annaliese Franz** and Professor **Timothy Lewis** are co-investigators. Marc Facciotti, associate professor in the Department of Biomedical Engineering and at the UC Davis Genome Center, is principal investigator on the grant.

As of Jan. 1, the division administers the [MPS Shop](#), combining the personnel and expertise of the Machine and Mechanical Shop from the Crocker Nuclear Lab with those of the Physics and Chemistry Departments to provide enhanced services under one roof at the Crocker Nuclear Lab in Jungerman Hall.

PEOPLE



Eric Prebys (*left*) will join the Department of Physics as a professor and will be appointed director of the [Crocker Nuclear Laboratory](#). Prebys's previous role was senior scientist at the Fermilab Accelerator Physics Center. In addition to being a well-known physicist in accelerator technology, Prebys is a leader in a new particle physics experiment called Mu2e. Thank you to Professor **Daniel Cebra**, who has been serving as interim director of CNL since July 1, 2016.



Professor **Jesús De Loera** is serving as Chair of the Faculty Executive Committee for the College of Letters and Science.

CHEMISTRY



Assistant Professor **Kyle Crabtree** discussed the science of lasers and light sabers alongside a screening of *Star Wars: The Force Awakens* at the department's first SCLnema event on Feb. 25. From Capital Public Radio: "[UC Davis Chemistry Professor Blasts Away Myths About The Lasers of Star Wars.](#)"



A generous financial gift from Professor **Susan Kaulzarich** and her spouse **Peter Klavins**, a research specialist in the Department of Physics, will support research opportunities for graduate students in the department. [Donate to this fund.](#)

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CHEMISTRY, CONTINUED

More than 44 undergraduates presented their research at the 11th annual **Richard Larock Undergraduate Research Conference** in May. The conference is supported by a generous financial gift from Richard Larock (B.S. '67), distinguished professor emeritus of chemistry at Iowa State University in Ames.

Researchers shared results and perspectives on the future of biologically-relevant chemistry research at the **17th annual R. Bryan Miller Symposium** in March. Plenary Speaker Dirk Trauner, the Janice Cutler Professor of Chemistry at New York University, discussed synthetic photobiology, a field which he is largely responsible for establishing.

The department will host four high school students this summer as a part of Project SEED, an American Chemical Society (ACS) program for high school students to experience what it's like to be a chemist.

CAO **Jessica Potts** was elected to serve as chair-elect for the Council of UC Staff Assemblies.

Safety officer **Debbie Decker** is serving as elected councilor for the ACS Division of Chemical Health and Safety.

CHEMISTRY: FACULTY



Research on [microbe-based chemical production systems](#) from Professor **Shota Atsumi**'s lab group was published March 12 in the journal *Nature Communications*.



Professor **Sheila David** discussed DNA chemistry and how the body repairs itself on the smallest scale on Capital Public Radio. [Listen to the interview.](#)



Assistant Professor **Davide Donadio** was named a 2017 UC Davis Hellman Fellow. The Hellman Fellowships provide support and encouragement for research by promising assistant professors.



Continuing Lecturer **Bryan Enderle** was selected as Picnic Day Parade Marshal.



Professor **Jackie Gervay-Hague** discusses the chemistry of tea and shared some unique teas with [Capital Public Radio](#) and the Davis Science Café.



Professor **Susan Kaulzarich** was selected for Chancellor's Award for Mentoring Undergraduate Research – Faculty Award.



Professor **Carlito Lebrilla** was a member of the committee that produced the American Chemical Society's 2017 Instrumental Analysis Chemistry exam.



Professor Emerita **Marilyn Olmstead** was selected as a Fellow of the American Crystallographic Association.



Assistant Professor **David Olson** received the 2016 Dean's Award for Excellence in Mentoring at Early to Mid-Career Level in the area of research.



Professor **Alexei Stuchebrukhov** was selected for a University Honors Program Mentorship Award.



Professor **Dean Tantillo** (*left*) and **Hoby Wedler** (Ph.D., computational organic chemistry, '16) were awarded Royal Society of Chemistry's Inclusion and Diversity Prize for their contributions to

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CHEMISTRY, CONTINUED

promoting and improving the accessibility, inclusivity and diversity of the chemical science community. **Professor Tantillo** was also selected as an American Chemical Society Fellow.



Assistant Professor **Jesús Velázquez** was selected as Scialog Fellow for Scialog: Advanced Energy Storage, a program of search and discovery for truly transformative energy storage systems. Participation is by invitation only.

HIRES AND PROMOTIONS



Marie Heffern was hired as assistant professor of bioinorganic chemistry.

CHEMISTRY: STUDENTS

Graduate student **Joya Cooley** (Kauzlarich Lab) was selected for a Travel Award from the Division of Inorganic Chemistry of the American Chemical Society.

Graduate student **Nhu Nguyen** (Tantillo Lab) was awarded a Marie Curie Postdoctoral Fellowship to study at Oxford University.

Alumna **Lizhi Tao** (Ph.D. '16) was awarded the 2016 National Scholarship for Excellent Self-Sponsored Studying Abroad Students.

Graduate student **Elizabeth Wille** (Kauzlarich Lab) was the first researcher hosted at Ames Laboratory through the DOE's Office of Science Graduate Student Program. [Read about Wille's experience.](#)

EARTH AND PLANETARY SCIENCES



Professor **Michael Oskin** took the helm as department chair on July 1. Thank you to **Louise Kellogg** for her service as interim chair in 2016 and 2017.



The [virtual reality software created for KeckCAVES](#) (the Keck Center for Active Visualization in Earth Sciences) now runs on gaming headsets, reports research scientist **Oliver Kreylos**.

Anyone can download the free Vrui software and applications and create their own virtual reality environments with gaming headsets, without the need for expensive projectors and screens.

The department's Augmented Reality Sandbox was featured in a story on [wareable.com](#): "[The best—and weirdest—things we saw at Augmented World Expo 2017.](#)"

EARTH AND PLANETARY SCIENCES: FACULTY



Professor **Magali Billen** received the Friedrich Wilhelm Bessel Research Award from the Humboldt Foundation.



Zircon crystals from eruption deposits around Mount Tarawera in New Zealand provided [a new understanding of what happens inside the magma reservoir](#) below an active volcano, Professor **Kari Cooper** reported June 16 in *Science*.



Professor **Charles Lesher** was selected as a Fellow of the Geological Society of America.

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EARTH AND PLANETARY SCIENCES, CONTINUED



Chancellor's Leadership Professor **Isabel Montañez** was selected for the Geological Society of America's Laurence L. Sloss Award.



Distinguished Professor Emeritus **Eldridge Moores** and Professor Emeritus **Jeff Mount** provided expert commentary on the Oroville Dam crisis (*left*) for [KQED](#) and [PBS NewsHour](#).



Professor **Ryosuke Motani** discussed his recent research on the “beautiful, and beautifully adapted” ichthyosaurs in a [Nature news story](#) published March 29.



Professor **Nicholas Pinter**, who holds the Roy J. Shlemon Chair in Applied Geosciences, was quoted in a May 5 [Climate Central story](#) on the flood threat to communities even when levees are in place. Pinter was also featured in UC Davis

Capitol Speaker Series: “California, Flood Risk, and the National Flood Insurance Program.”

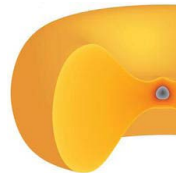


Professor **John Rundle** has developed snapshots of the likelihood of major earthquakes occurring in megacities around the world using [a new statistical approach for estimating earthquake risk](#).

The work was presented May 22 at the joint meeting of the Japan Geoscience Union and the American Geophysical Union in Chiba, Japan.



Researcher **Anne Russell** and colleagues found magnesium levels vary in foraminifera shells due to [different growth rates during daily light/dark cycles](#). The findings were published May 15 in the journal *Nature Communications*.



Professor **Sarah Stewart** and graduate student **Simon Lock** proposed a [new type of planetary object, called synestia](#), that forms when planet-sized objects smash into each other. Their work was published May 22 in the *Journal of Geophysical Research: Planets*.



The California Academy of Sciences has awarded its highest honor, the Fellows Medal, to Distinguished Professor **Geerat Vermeij**. The Fellows Medal is given to prominent scientists who have made outstanding contributions to their fields.



Professor **Rob Zierenberg** was featured in a news story about the Iceland Deep Drilling Project published Feb. 1 on [BBC News](#). He became emeritus on July 1.

HIRES AND PROMOTIONS

Maxwell Rudolph was hired as an assistant professor.

Tessa Hill was promoted to professor.

Isabel Montañez was promoted to distinguished professor.

Howard Spero was promoted to distinguished professor.

EARTH AND PLANETARY SCIENCES: STUDENTS

Alumna **Catherine Davis** (Ph.D., '16) led [the first study of its kind](#) to show the combined impact of shell building, spine repair, and physiological stress in foraminifera under high CO2 conditions. The findings were published May 22 in *Scientific Reports*.

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EARTH AND PLANETARY SCIENCES, CONTINUED

Graduate students **Carina Fish** and **Michael Huh** were top 10 finalists in the UC Davis 2017 Grad Slam competition, an annual contest in which graduate students are given three minutes to describe their research for a general audience.

Alumna **Amy Williams** (Ph.D. '14) and Professor Dawn Sumner collaborated with the U.S. Geological Survey to investigate microbial structures in Mars-like environments on Earth. Their findings were published March 2017 in the [Geomicrobiology Journal](#).

MATHEMATICS



Professor **Abigail Thompson** became department chair on July 1. Thank you to Professor **Dan Romik** for three years of service in this role.

The [2017 Bay Area Optimization Meeting](#) was held at UC Davis in May. The conference brings together researchers who work on mathematical methods to analyze large amounts of data and address decision problems faced by government and industry.

The [Thurston Lecture](#) was delivered in May by Dylan Thurston, a professor of mathematics at Indiana University in Bloomington and Fellow of the American Mathematical Society. This is the first of an annual series of lectures in honor of former UC Davis mathematician William P. Thurston.



Professor **Steve Shkoller** and his co-organizer, Professor Alexandru Ionescu of Princeton, launched the [first annual summer school and international workshop on water waves](#) and related models. Held at Bodega Marine Lab in June, the workshop and school are intended for advanced undergraduate and graduate students and postdoctoral scholars.

MATHEMATICS: FACULTY



Professor **Jesús De Loera** was selected for the Mathematical Association of America's Golden Section Teaching Award for Distinguished College or University Teaching of Mathematics.



Assistant Professor **Tudor Dimofte** (*top left*) and Assistant Professor **Adam Jacob** (*bottom left*) were selected to receive 2017 Hellman Fellowships. The fellowship promotes the scholarly growth of faculty members at the assistant professor rank.



Distinguished Professor **Michael Kapovich** was named a 2017 Simons Fellow in Mathematics and Theoretical Physics.



Professor **Dan Romik**'s research on the [moving sofa problem](#) was featured by Numberphile and other news outlets.



Professor **Thomas Strohmer**'s work on data processing for chemical weapons detection was [featured by the National Science Foundation](#).

HIRES AND PROMOTIONS

Shiqian Ma was hired as assistant professor.

Michael Kapovich was promoted to distinguished professor.

Kevin Luli was promoted to associate professor.

Bruno Nachtergaele was promoted to distinguished professor.

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NANOMATERIALS IN THE ENVIRONMENT, AGRICULTURE, AND TECHNOLOGY (NEAT)

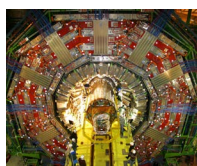
The AlexSYS workshop on [High Temperature Oxide Melt Solution Calorimetry](#) was held in June. The AlexSys is a high-sensitivity Calvet calorimeter optimized for high-temperature solution calorimetry in molten solvents at temperatures to 1000 degrees Celsius. It is based on Professor **Alexandra Navrotsky's** design, is now commercially available, and has been established in several university or national lab research groups.

PHYSICS



The location for the [Center for Quantum Mathematics and Physics](#) (QMAP) in the Physical Sciences Library was approved for final design. The department is also moving ahead in planning for an Ultraslow Vibration Laboratory annex to be located in the parking lot area on the west side of the building. Expected to take about two years to construct, this facility will host new Scanning Tunneling Microscopes (STMs) that will be used to characterize the surface of novel materials. Renovations for other new condensed matter experimentalists are also underway.

The department was featured in "[Preparing Physics Students for 21st-Century Careers – ComPADRE](#)," an American Physical Society report on best practices in physics education. UC Davis was one of five case studies citing especially successful programs in undergraduate physics.



The U.S. Department of Energy renewed its grant for high-energy physics research at UC Davis. The research program has now enjoyed continuous DOE support for nearly five decades.

PHYSICS: FACULTY



Distinguished Professor **Andy Albrecht** was named director of QMAP.



Professor **Jim Crutchfield** is part of a collaboration with Intel Research and Lawrence Berkeley National Labs' NERSC supercomputer center to [develop algorithms to model and predict climate](#) on one of the world's largest supercomputers. The project, "Spatiotemporal Computational Mechanics—Developing a Novel Approach to Automatically Modeling Coherent Structures and Predicting Turbulent Flows in Climate Dynamics," has been funded by Intel for three years.

HIRES AND PROMOTIONS

Stefano Valenti was hired as an assistant professor.

Emilija Pantic was promoted to associate professor.

Richard Scalettar was promoted to distinguished professor.

PHYSICS: STUDENTS

Graduate student **Cina Aghamohammadi** was awarded the 2017 Biruni Prize by the Iranian-American Physics Network. The prize promotes and recognizes outstanding research by a physics graduate student of Iranian heritage.

Graduate student **Austin Hoag** identified an ultradistant galaxy thought to be typical of galaxies in the early universe. The findings were published April 10 in *Nature Astronomy*. Hoag is part of an international collaboration [surveying the sky around massive galaxy clusters](#) to find "ordinary" galaxies from a period about a billion years after the Big Bang. Hoag was also selected for a UC Davis Graduate Student Travel Award.

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STATISTICS

A new [Statistical Data Science track](#) was launched within the Statistics undergraduate major. This track emphasizes data handling skills and statistical computation and is recommended for students interested in statistical learning methodology, advanced data handling techniques and computational aspects of statistical analysis.

The [Research Training Group](#) (RTG) Statistical Sciences Symposium was held in May.

Pete Scully, whose previous role was graduate coordinator for the department, was appointed as MSO. Thank you to Pat Aguilera for her 15 years of service as MSO and congratulations on her retirement.

STATISTICS: FACULTY



Distinguished Professor **Hans-Georg Müller** was selected for a Humboldt Research Award, given in recognition of fundamental discoveries, new theories or insights that have had a significant impact on the awardee's field of research.

HIRES AND PROMOTIONS

Satohiro Tajima was hired as assistant professor with appointments in statistics and psychology.

Alex Aue was promoted to professor.

Debashis Paul was promoted to professor.

STATISTICS: STUDENTS

Doctoral student **Haoran Li** is one of the winners of the Student Paper competition at the ICSA Applied Statistics Symposium held in Chicago during June.



The Statistics Club and other undergraduate student volunteers organized the second annual [IIDATA Convention](#) in February. The event had more than 300 attendees and consisted of workshops, tech talks, industry panels, a data science competition and an undergraduate research exhibition.

MAKE A GIFT

Gifts to the College of Letters and Science bolster faculty support and create new research opportunities that lead to breakthrough discoveries.

Contact: Charlene Mattison, Assistant Dean for the College of Letters and Science, (530) 752-3429 or cmattison@ucdavis.edu.

Online: You can make a gift online by clicking this [fund list](#).

Mail: Checks payable to UC Davis Foundation. Address: UC Davis Gift Administration, 1460 Drew Avenue, Suite 100, Davis, CA 95618. Gifts will be directed to the UC Davis Annual Fund unless you specify otherwise. Please include in the memo section where you would like your gift to be designated.

*Produced for the Division of Mathematical and Physical Sciences
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Special thanks to all of our department contributors!*