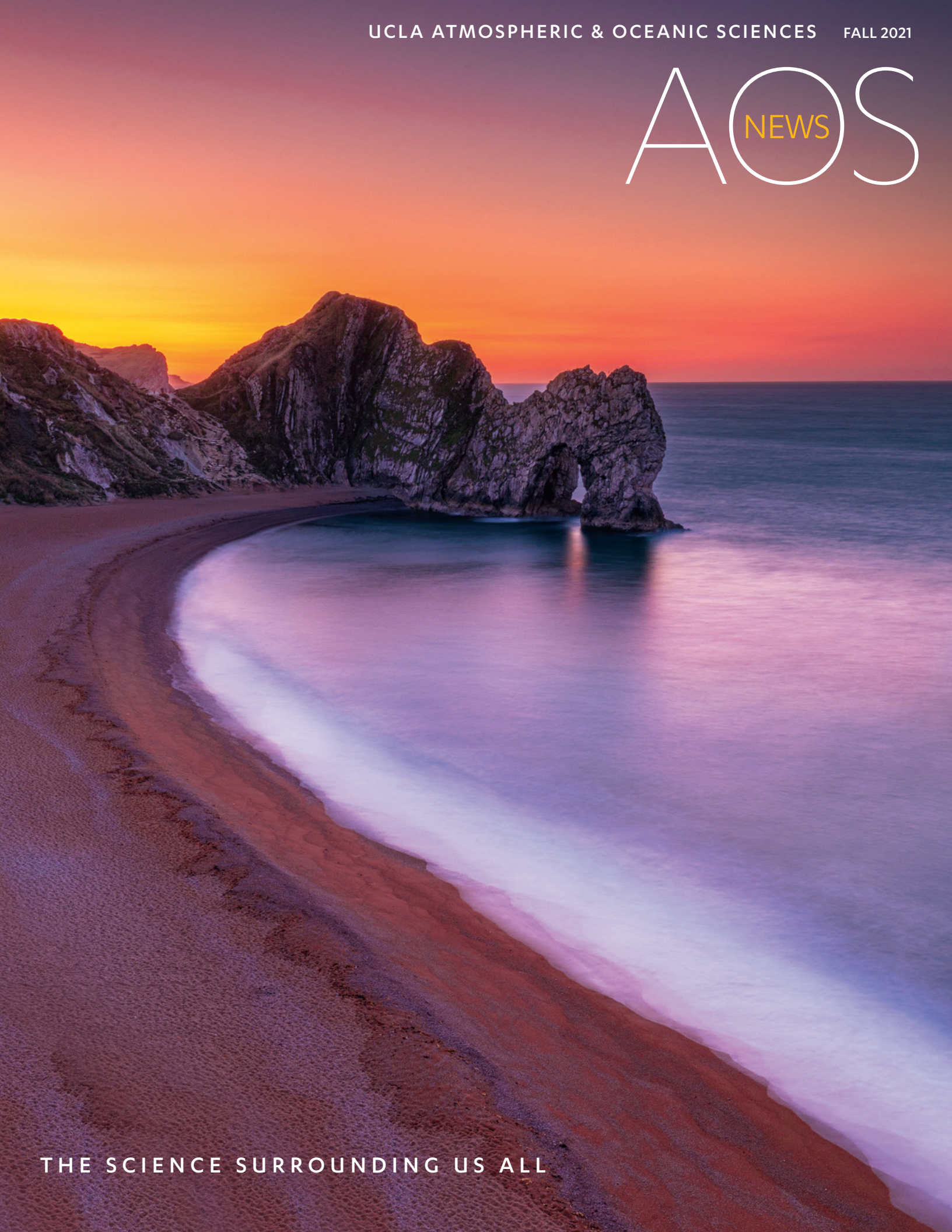
UCLA ATMOSPHERIC & OCEANIC SCIENCES FALL 2021

AOS NEWS



THE SCIENCE SURROUNDING US ALL

LETTER FROM THE CHAIR

In some ways you might expect and some not, the past year and a half have been a time of upheaval. The pandemic: We pivoted to online teaching at the end of winter quarter 2020 and remained that way until a few months ago. There were heroics and successes in the efforts in remote teaching, but overall, learning outcomes were lower than in person. Research labs were closed for several months, and then opened to eerily quiet hallways, and new undergrad researchers were not allowed to join. But those days are over. Halls are now buzzing with most everyone returning in person 3–5 days each week. We welcomed our largest classes of incoming undergraduates and graduate classes in recent memory. The only thing that hides our joy at being back among our colleagues are the masks, which I am happy to report we wear with near 100% compliance.

Photo: Stuart Wolpert, UCLA Media Relations

Black Lives Matter Movement: Work during summer 2020 brought more changes to the department. Building on recent work, we carefully examined many of our practices and redoubled our efforts at making all our processes more inclusive. Graduate students are now represented on most departmental committees, among many other changes.

Other big changes: we wished happy retirement to three 30+ year-members of our staff: weather guru James Murakami, although we are grateful he is still volunteering some of his amazing forecasting ability to the Department; lecturer Jeff Lew, who taught generations of mostly non-science majors the most important aspects of air pollution and meteorology; and Department Mechanician Paul Northrop, who provided support to myriad problems in labs, and probably helped provide the wiring or Wi-Fi to any computing device you might have used in the Department. We were sad to lose Professor Kuo-Nan Liou in spring 2021, and two of our emeriti faculty, Akio Arakawa also in spring 2021 and Richard Thorne in summer 2019.

The past 18 months have been tumultuous, but change has been afoot for years. Our faculty these days is mostly young, and oceanography and biogeochemistry have grown tremendously. Next summer we will be joined by a new Space Physics faculty member, Dr. Roger Varney. Undergraduates can choose from AOS, AOS/Math and Climate Science undergraduate majors, and now number about 50 majors and 30 minors. We are excited that they have started an undergraduate version of the vibrant graduate student organization, Chi Epsilon Pi (XEP).

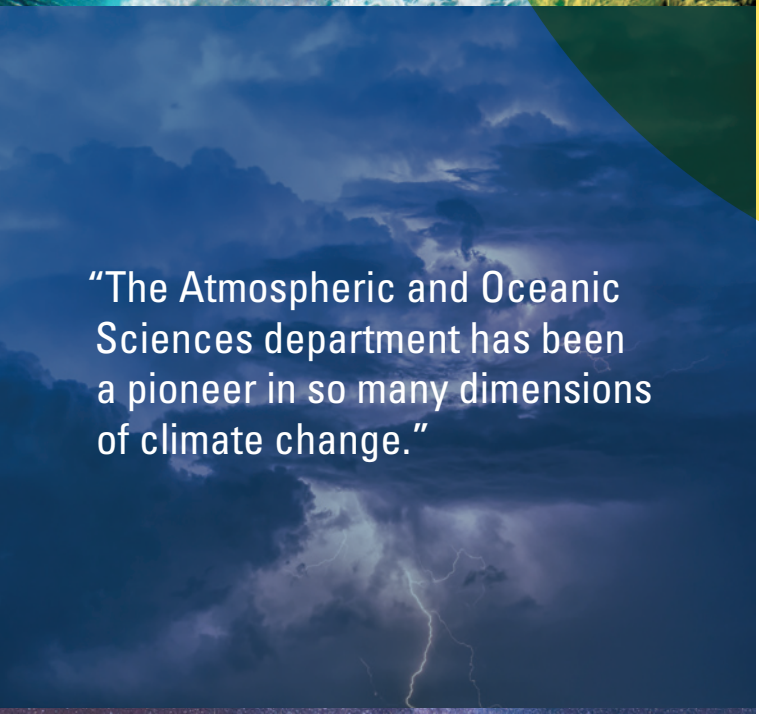
Some things that haven't changed: AOS is an exceptionally strong, dynamic academic department. Our feature article outlines a small subset of our current research, giving a flavor of the ever-present passion and creativity the AOS Department has always brought to the problems we address, from fundamental to applied, each one of pressing importance to society.

One way in which we are assuredly not strong, however is in our track record for keeping in touch with our Alumni and friends. We're trying to improve! We certainly hope you enjoy the results.

Suzanne Paulson

Chair and Professor
UCLA Atmospheric & Oceanic Sciences

INSIDE



"The Atmospheric and Oceanic Sciences department has been a pioneer in so many dimensions of climate change."

AOS and its Impact on Our Planet

The seeds of innovative scientific work that has helped to demystify Earth's natural systems were sown here at UCLA during a very different global crisis.

It is a history that isn't well known beyond certain circles, even within UCLA. The Department of Atmospheric and Oceanic Sciences (AOS) was born in 1940 as the Department of Meteorology. Its first chair, Jacob Bjerknes, shot to the top of his field by the age of twenty when he published his groundbreaking paper, "On the Structure of Moving Cyclones." It presented a model enabling such effective weather forecasting that decades of scientific discovery have been built upon it, enabling countless technological leaps with ripple effects throughout every aspect of life, human or otherwise.

This science was drafted into service during World War II to assist the United States and other Allied nations with forecasting and weather analysis to support military efforts by land, sea, and air. Bjerknes and the fledgling meteorology department trained more than 1,000 weather officers to apply cutting-edge scientific techniques to life-or-death scenarios.

Now, climate change has risen as an even greater threat and scientists in AOS continue tackling the world's challenges through their research and teaching. They study land, ocean, and upper and lower atmosphere through work in the arenas of biogeochemistry, climate and weather, oceanography, space physics, and chemistry and radiation.

"Together, the department brings more than one hundred creative minds to contribute both fundamental and applied science to today's most pressing problems," said Prof. Suzanne Paulson, who is the department's first female chair.

AOS's newest degree program in Climate Science is leading the way as the first degree of its kind in the world among major research universities.

"The Atmospheric and Oceanic Sciences department has been a pioneer in so many dimensions of climate change," said Prof. Alex Hall, whose research focuses on climate dynamics.

Just one example of the department's leadership has been in the development of climate simulations, a primary tool to predict how the climate is changing. "The department has developed a lot of the nuts and bolts of those models going back decades," Hall added. "We are channeling the department's legacy in our efforts to combat really deep challenges."

Atmospheric chemistry and physics underlie many of the world's most serious environmental problems, including air quality and climate

"UCLA and AOS play an important role by providing scientific understanding, advising government agencies, and training the next generation of researchers and environmental managers."

change. To former department chair Prof. Jochen Stutz, solutions to these problems have to be based on sound understanding on the underlying mechanisms as well as communication with the various stakeholders in order to protect people and the environment.

"UCLA and AOS play an important role by providing scientific understanding, advising government agencies, and training the next generation of researchers and environmental managers," Stutz said.

Yasmin Rizal, who came to UCLA from Malaysia and received their B.S. in Atmospheric and Oceanic Sciences in 2020, highly valued this connectivity between science and the public during their time as a student.

"We have the scientists who work on research. We also have people who work with L.A. City Council, communicating science to them, and people giving presentations to school kids," Rizal said. "The department has always had that connection between knowledge and policy, and things that can bring change in the real world."

Like Rizal, many others have gravitated to AOS from around the world in order to study the Earth system in an innovative and collaborative way.

"When I got to the atmospheric sciences, I started to realize how interconnected everything was," said David Gonzalez, who received his Ph.D. in Atmospheric and Oceanic Sciences in 2019 under the guidance of Prof. Paulson. She researches chemical and physical aspects of timely problems affecting Earth's atmosphere, including determining aerosol optical properties and their impacts on the planetary climate. Her lab also measures people's exposure to urban pollutants and investigates chemical sources underlying the toxicity of particulate pollution.

Now a postdoctoral Scholar in Cardiology at UCLA's David Geffen School of Medicine, Gonzalez has found a novel way to apply the knowledge gained from work in Paulson's lab to understanding how pollution impacts human health. The connection between two seemingly distinct areas of study is a perfect example of the innovation fostered within AOS.

"Intersectional science is what I find exciting, finding linkages between the way people in different fields think and trying to find new approaches to solve problems and make discoveries," said Prof. Robert Eagle. His work seeks to bring insights from biology and geosciences together to understand the response of organisms and ecosystems to climate change.

Like Eagle, Prof. Daniele Bianchi also focuses on biogeochemistry within oceans —an ecosystem that provides enormous benefits to humankind and all life on Earth, but which is under growing pressure from human activities from acidification to overfishing and pollution. Bianchi works to understand how the oceans and marine life are responding to these pressures, and how we can more effectively manage and protect marine ecosystems to preserve their intrinsic value and the services they provide to people.

"One of the most exciting aspects of doing this work in the AOS department is the ability to work side by side with world-leading experts on all the different aspects involved in this research," Bianchi said. "These range from field work in remote parts of the ocean, to lab experiments on marine organisms, to numerical simulations run on the fastest supercomputers. The depth and breadth of the department is truly remarkable."

Prof. Tina Treude conducts research from a similar set of concerns as Bianchi's.

"Microorganisms in the oceans changed our planet before life evolved," she said. "It's crucial to understand how microorganisms in the ocean react to anthropogenic changes and whether they will create positive feedback or mitigate the effects of climate change."

Forces far from Earth are more frequently touching our lives as telecommunication becomes increasingly dependent upon satellite technology and space exploration sends greater numbers of humans into orbit and beyond. This is why a different type of weather—space weather—is a primary research focus in AOS.

"It is important to understand the space environment in which these satellites travel, in order to best protect them from damage or failure," said Prof. Jacob Bortnik, who researches space physics, space weather, and machine learning. And not just satellites, but also people who may be traveling in crafts subject to incomprehensibly powerful energetic ejections from the sun, forces which are also fully capable of disrupting life down on the ground.

Studying space weather goes hand in hand with machine learning, the speed and capacity of which is critical for analyzing the amount of data returning to Earth from instruments monitoring the planet from space. For Bortnik, training UCLA students in these techniques is a meaningful way to contribute to future leadership not just in space weather but all areas within AOS.

"Searching through huge amounts of data to identify subtle patterns and features will ultimately lead to better ideas, theories, and predictions," Bortnik said.

Satellites are key to scientific observation of the kind that Prof. Rong Fu's work relies upon. Her research aims at understanding the causes of droughts and rainfall variations and their interaction with underlying vegetation and wildfires over both North and South America. To do this, Fu utilizes a variety of observations, but especially those by satellites.

The data that Fu is able to successfully analyze has a direct impact back on earth. She is a co-leader of the drought task force for the National Oceanic and Atmospheric Administration (NOAA). "It is very exciting and rewarding to see my research directly help the National Integrated Drought Information System to determine what is causing the current drought over the western United States, why it is so severe, and how droughts will change in the future," she said.

With drought comes wildfire, a topic of high priority to many scientists in AOS, including Hall and Prof. Pablo Saide. "Wildfires are getting worse due to climate change, and it is estimated that smoke through health effects kills many more people than the fire does. Thus, studying and trying to improve smoke predictions is of utmost importance," Saide said. "It excites me that it is an extremely complicated problem to solve but at the same time it can help society in meaningful ways."

Saide shares in the enthusiasm for collaboration expressed by his colleagues. "I think my research complements the research from other faculty in the department studying the climate aspect of wildfires like Alex Hall, Suzanne Paulson's work on smoke properties and health effects, and remote sensing work by Jochen Stutz, which really positions us as a world leader in the topic," he said.

The unique Earth systems studied by AOS scientists have always been interdependent. This fact has not changed nor is it likely to if Earth as we know it is to survive. But there has never been a more urgent need for us to understand their synergy, to push the boundaries of science in each of those realms so the sum of all discovery may provide solutions we need to help our civilization persist and thrive.

A tradition of public service through science has always been at the heart of AOS, all the way back to when it was the Department of Meteorology. "Now we're in a new kind of a struggle, a struggle to manage our relationship with our environment. That's the heart of the climate change issue," said Hall. To him, the department's Climate Science degree program, coupled with the work of each and every scientist within AOS, is at the heart of the fight.

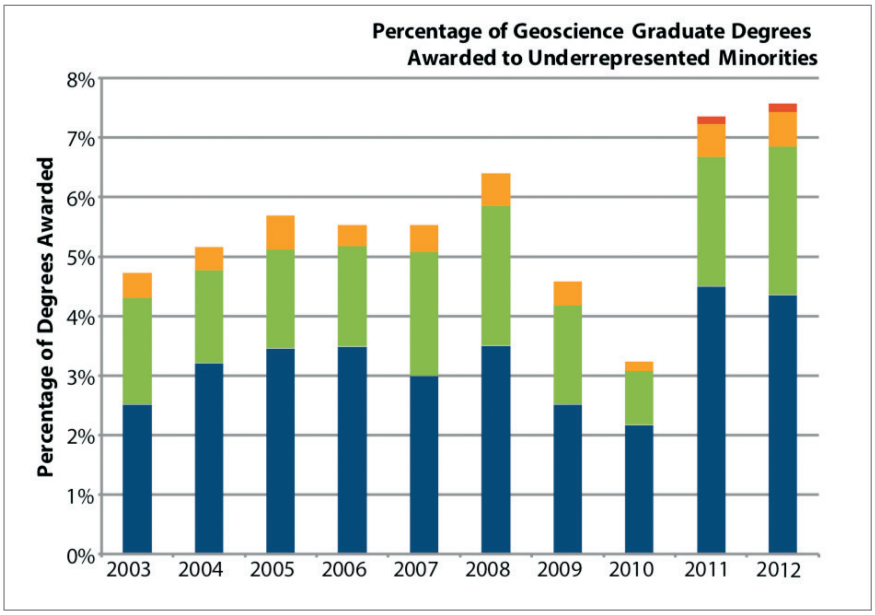
"It's an effort that is on the scale of World War II. That's the kind of response that we need to really address this issue," he said.

AOS & Diversity

Our planet is facing the largest environmental crisis in human history. The Atmospheric and Oceanic Sciences (AOS) Department studies the effects of climate change, air pollution, and environmental degradation, which leaves no person unaffected and disproportionately impacts marginalized communities, including many who identify as Black, Indigenous, Latinx, and People of Color. The Geosciences have historically had a significant underrepresentation of minority groups and women, which largely persists to this day. There has been no increase in the number of underrepresented minorities gaining Ph.D.s in the last 40 years in the Geosciences relative to demographic shifts in the population. Unfortunately, these numbers are also reflected in our Department, both in Ph.D.s earned and in faculty demographics. While there have been marked improvements in the gender balance of graduating Ph.D.s nationally, these gains are not yet reflected in our faculty, indicating a bottleneck in the academic pipeline that is pervasive even at the undergraduate level. There is lost potential and talent at every academic level in our field. As members of the Geoscience community, we accept that we have historically failed in representing both domestic and international racial, ethnic, gender, and LGBTQ+ diversity within our faculty and students.

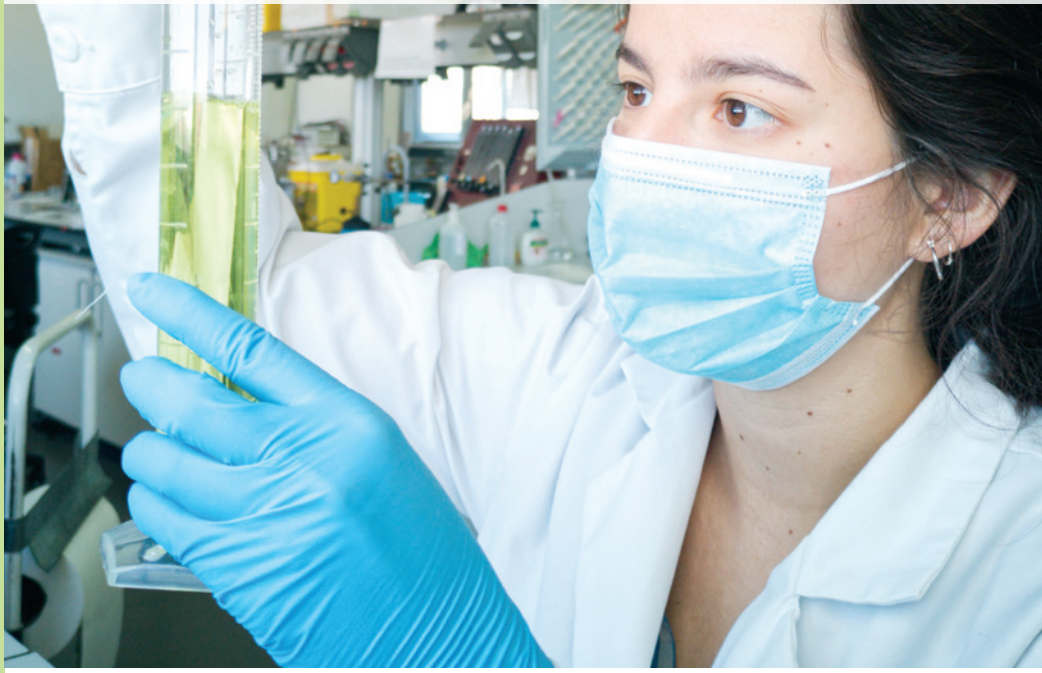
While acknowledging the problem is an important step, we take this opportunity to commit to an anti-racist and anti-discriminatory position, and to continually move toward diversity. The AOS Department pledges to (1) strive to actively create a diverse academic community; one that reflects the broader community and encourages the highest quality of research, (2) foster an environment that recognizes and supports diversity and gives each person a space for safe expression, and (3) identify and implement mechanisms that actively combat racism, exclusion, and discrimination and hold members accountable for their actions.

We rely on diverse talents and perspectives to study past, present, and future environmental changes and challenges, and to provide advice for decision makers. The quality of science and solutions can only improve if recruitment of talent includes the entire breadth of our society. We value the important progress made in the Geosciences from members from historically marginalized communities, and recognize the substantial institutional obstacles that these students, postdocs, and faculty face. We are committed to making our Department a safe and inclusive space where diversity is welcomed, fostered, and celebrated. We will not accept failure in achieving the goals and expect that future statistics will demonstrate our success.



Percentage of Geoscience Bachelor's Degrees Awarded to Underrepresented Minorities in the US between 2003 and 2012.[1]

"...Gains in Hispanic or Latino PhDs largely reflect an increase in the relevant population in the US, and that there are no gains in Ph.D.s earned among the other underrepresented groups. In conclusion, our fields have not increased underrepresented minority representation over the past 40 years."[2]



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Coming to UCLA

RICHARD P. TURCO

I officially joined the Faculty of the Department of Atmospheric Sciences at UCLA in 1988. Early on, wandering around the department's home base in the Mathematical Sciences Building (MathSciences) was like drifting through a museum of ancient meteorological history. The door to the front office had inscribed in fancy type on a glass pane, Department of Meteorology, even though it had become a Department of Atmospheric Sciences a decade earlier. There didn't seem to be any great rush to let go of the legacy of the renowned weather wizards that had established the department in the 1940's—Bjerknes, Holmboe, Neiberger and Charney, and later Mintz, Sekera, Edinger, Wurtele and the rest. Then there was the laboratory that Hans Pruppacher had established in the basement of Math Sciences to study the physics of water droplets and ice crystals in moving air. Pruppacher had earned his Ph.D. in the department in 1962, and eventually stayed on as a faculty member. The unique laboratory he built up from scratch featured a massive wind tunnel system, cleverly oriented vertically not horizontally, so that a skilled technician, standing on a high platform above the main plenum, could delicately adjust the airflow to suspend a small hydrometeor for analysis, or recreate the microphysical processes occurring in convective updrafts.

But that was not all. Pruppacher had also constructed a seven-story high "rainshaft" for measuring the falling velocities of large water droplets. At the time, computers were not capable of accurately solving the highly complex equations governing the behavior of falling, oscillating droplets, whose "terminal fallspeeds" were important in the science of cloud physics. So Pruppacher somehow convinced the architects of the Math Sciences building—at the time it was constructed—to place a small room on each floor, one directly above the next, with an opening in the floor and ceiling, creating an uninterrupted channel from the basement to the roof. In this shaft, he built a continuous rigid plastic tube about a foot-and-a-half in diameter (large enough to accommodate the inevitable horizontal deviations of a falling drop so it would not hit the wall); this tube amazingly extended the entire height of the building, perhaps a hundred feet. Droplets could be released at the top of the shaft, and after a sufficient distance would reach stable terminal speed. The velocity was determined using a series of photocells positioned along the tube. While an extraordinarily creative and ambitious project, by the time I arrived at UCLA the clunky plastic rain-shaft had become a relic of a bygone presupercomputing era. Later, the many rooms associated with the shaft were variously employed as space for alternative experimental setups, small meetings, storage, or general junk accumulation.

When I joined the department, I was generously bequeathed Pruppacher's laboratory facilities—you could say literally, I got the shaft. At the time, Jeffrey Lew, who earned his Ph.D. working in the lab, had returned from a position at the National Center for Atmospheric Research to continue his cloud physics research supported by the National Science Foundation (NSF). Unfortunately, the NSF was ready to pull the plug on the UCLA wind tunnel, and I had been given the "opportunity" to try to revive it. From my point of view, an analogous situation might be something like inheriting a dusty Model T Ford from grandpa's garage with the proviso that you get it back on the road for daily commuting. By the time I arrived, chemical experiments were also being carried out in a smaller multi-story plastic tube that had been installed inside the larger rain shaft. It was, to say the least, somewhat Rube Goldberg

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>
> RICHARD TURCO

compared to modern experimental techniques. Although atmospheric chemistry was my "field," I never had an experimentalist bent, and I wasn't really interested in starting down that road. With Lew's essential help, I did try to get the NSF to continue its support of the wind tunnel, and the general facility, but in the end those efforts failed, probably because of my less than enthusiastic commitment. Later, as Department Chair in the early 1990's, I repurposed the wind tunnel facility to house a new chemistry laboratory for a recently hired faculty member, Suzanne Paulson. The wind tunnel was still operational at the time, but when it was running the noise level would drive everyone else out of the room. Because of this, and as a practical matter owing to dwindling support, the wind tunnel was eventually shut down and dismantled.

Over time, however, others in the department made good use of Pruppacher's lab space. The wind tunnel was originally housed in a vast two-story room with a large overhead crane to lift and move heavy components for assembly and maintenance. Ultimately, the crane was removed, and the space partitioned with a full second floor. Some of the old lab equipment was reassigned to new duties. For example, Suzanne Paulson recently told me that a large walk-in freezer used by Pruppacher to process and store ice crystals had been converted into a draft-free enclosed space for making highly sensitive microbalance measurements. Of course, the refrigeration compressor was shut down, the lock on the door disabled, and the large axe hanging inside—to chop your way out just in case the door accidentally shut behind you—removed. Over time, areas within the original voluminous facility would also be dedicated to the research of Kuo-Nan Liou and Ulli Seibt.

These are fond memories of my early years in the department, as it evolved and broadened further into the Earth system and climate sciences, and as the faculty grew—and grew younger and more diverse. Everyone I have known who has been a part of this department has been, in no particular order, brilliant, dedicated, proud, delighted, gratified and thankful to have helped build its legendary status in the global community. Maybe it's time to contribute in another way—establishing a lasting legacy of financial support.

DONORS WHO MAKE A DIFFERENCE

Rich and Linda Turco are longstanding supporters and members of the AOS community. Richard is a renowned atmospheric chemist and an expert in environmental modelling. He joined the faculty as a full professor in 1988, serving as Chair of Atmospheric and Oceanic Sciences, and the founder of the Institute of the Environment and Sustainability while at UCLA. Richard retired from the University in November 2011 and remains active in the field.

In 2017 Rich and Linda generously established the **Richard P. and Linda S. Turco Endowed Graduate Scholarship** to support fellowships for outstanding graduate students in their third and fourth years of study—vitally important years in a doctoral student's academic career. A portion of this endowment also supports the **Richard P. and Linda S. Turco Exceptional Research Award** for top papers by AOS graduate students or postdoctoral scholars published in a scientist journal. In 2019 Rich and Linda made another incredibly impactful gift to the department, establishing the **Richard P. and Linda S. Turco Term Chair**. This chair will leave a lasting legacy within the department as the first endowed Chair in the history of Atmospheric & Oceanic Sciences. Rich and Linda hope the Chair will enhance the breadth and diversity of the AOS faculty, and will continue to encourage the highest level of societally relevant research and teaching at UCLA.

We are very grateful for these transformational gifts and are pleased that each of these endowments received Dean's Gift Matching Funds.

DANIELE BIANCHI

ASSISTANT PROFESSOR
AT AOS SINCE JULY 2015

Who are you and what do you do?

I am an oceanographer researching the interactions between the ocean's physical circulation and marine life—from microorganisms to fish and whales. For this research, I combine data synthesis and numerical models, many developed by students and researchers in my group. Some research foci in my group include the dynamics of oceanic oxygen minimum zones, where oxygen plummets to vanishing levels; the ocean's biological pump, which transfers carbon and nutrients from the surface to the deep ocean; the role of zooplankton and fish in the marine ecosystem; and the impacts of human perturbations, from global climate change to local pollution and fisheries.

What led you to UCLA?

My lifelong passion for the ocean, coupled with my enjoyment of math and physics courses, made me the perfect candidate for an oceanography career. With the research opportunities and support provided by my mentor, I was fortunately admitted into the Atmospheric and Oceanic Sciences Ph.D. program at Princeton University, where I graduated in 2011. After graduation, I obtained postdoctoral positions at McGill University and the University of Washington, and an assistant professorship at UCLA. What attracted me to UCLA was the quality of my colleagues in the AOS Department, the focus on applying numerical models to understand Earth's climate, and the excellence and diversity of the student body.

What are some of your accomplishments and what are your future goals at UCLA AOS?

I am excited about a few recent projects. The first involves two field campaigns off the Oregon coast to study the sources and transport of dissolved iron in the coastal ocean, where one of my students will provide the necessary physical measurements. Another exciting project is a collaboration with scientists at UCLA and other institutions to understand the effects of wastewater pollution from the city of Los Angeles to the coastal waters of Southern California. These findings are currently being considered by policymakers to improve water quality and increase protection of marine resources. Besides teaching courses at UCLA, I volunteer as a youth educator with the non-profit Students On Ice Foundation, leading oceanography workshops during expeditions to the Arctic and Antarctica with high school students from all over the world, including Inuit and First Nations. This experience has given me a new appreciation of the importance of the ocean for societies that traditionally rely on it for their livelihood and culture, and of the dramatic impacts of climate change on the ocean. Consequently, this has strengthened my desire to conduct research with broad implications, reach out to the public, and advocate for the conservation of the marine ecosystem.

RONG FU

PROFESSOR AND VICE CHAIR (AOS)
DIRECTOR (JIFRESSE)
AT AOS SINCE 2016

Who are you and what do you do?

I am a professor, researcher, and all-around science advocate. I co-lead the NOAA Drought Task Force on researching the causes and predictability of droughts. I was elected as a 2020 Fellow of AGU and AAAS, and will receive the AMS Award for Outstanding Achievement in Biometeorology in 2022. My research aims at understanding the role of the atmospheric hydrological cycle and its interaction with Earth's surface in determining the stability of Earth's climate at global and regional scales, and applying climate science to support regional decisions. My research focuses on the mechanisms that control the rainfall variability over Amazonian and Pan-American monsoon regions, and on how changes in global climate, local vegetation, biomass burning, and oceanic decadal variability have influenced rainfall variability in the recent past and will influence rainfall and droughts in the future.

What led you to UCLA?

My curiosity in the rainforest's role in the hydrological cycle led me to pursue a B.S. in Geophysics from Peking University (1984), a Ph.D. in Atmospheric Sciences from Columbia University (1991), and a postdoc fellowship at UCLA (1991–1993). I was later

PABLO SAIDE
ASSISTANT PROFESSOR
(AOS AND IOES)
AT AOS SINCE NOVEMBER 2017

appointed as a visiting scientist fellow at Princeton University (1994) and began my first faculty role as an Assistant Professor at University of Arizona (1994–1999), then as an Associate Professor at Georgia Institute of Technology (1999-2008), and Professor (2008–2016) and Associate Chair (2011–2015) of the Department of Geological Sciences at the University of Texas at Austin. I found myself back at UCLA in 2016.

What are some of your accomplishments and what are your future goals at UCLA AOS?

One of my accomplishments is that my research is among the earliest to show an active role of tropical rainforests in initiating dry to wet season transition over Amazonia and the significance of the Tibetan Plateau in determining water vapor transport to the global stratosphere. I've had the honor of being a panelist on a financial think tank co-hosted by AAAS and Resources for Future, led by Nobel Laureates in climate and economy, to address climate change impacts on the economy. I learned that the large uncertainty in predicting and projecting droughts is a major setback in determining the financial impact of climate change. I hope to encourage students to research, collaborate, and devote their future career to studying extreme droughts and advance the scientific response to these potential events.

Who are you and what do you do?

I consider myself a modeler. My group performs research to advance modeling capabilities for air quality, atmospheric composition and climate assessments. For instance, we perform research to improve the predictive capability of air quality forecasting systems for air pollution episodes, i.e., wildfires and hazy conditions. Another example is the assessment and improvement of the representation of aerosol interactions with clouds and solar radiation, which accounts for a large fraction of the uncertainty in climate projections. We heavily rely on observational data in our work to evaluate and constrain models, including satellite retrievals, surface networks and airborne data. This has led us to participate in multiple field campaigns where our modeling guided the planning and influenced sampling decisions that would allow us to better improve models.

What led you to UCLA?

I was led to UCLA for many reasons. A few years ago I felt it was time to take the next step in my career and become a professor, where I could lead a group of students and scientists into performing the research I was interested in. AOS is known to have one of the best graduate programs in the country, thus, being able to attract highly qualified students was a bonus. Because AOS has a history of model developments in atmospheric and oceanic sciences, I felt it was the right place to develop my research. Additionally, I saw many opportunities for collaboration with colleagues in AOS and IoES that could widen the breadth of the research my group could perform.

What are some of your accomplishments and what are your future goals at UCLA AOS?

The formation of my research group is an important achievement. Working alongside a diverse group of students and researchers to build the infrastructure necessary to develop this research has brought me great joy. Being able to attract funding from multiple agencies (e.g. NASA, NOAA, DoE, NSF) has been encouraging as it shows that the research we perform is relevant and needed. One of the most rewarding experiences I have had has been participating in a NOAA-NASA field campaign (FIREX-AQ) that focused on measuring smoke from fires. Although I participated in multiple campaigns in the past, our group in FIREX-AQ coordinated the air quality forecasts from multiple institutions. Thus, our research on model evaluation and development now has the potential for a broader impact. My plan is to keep participating in future field campaigns and eventually lead one if the opportunity presents itself. I'm also looking forward to seeing my group grow, thrive, and develop their careers.

AKIO ARAKAWA

Distinguished Research Professor Emeritus

Dr. Arakawa received his B.S. in Physics in 1950 from University of Tokyo, then worked in the Japan Meteorological Agency forecast research division, and later joined UCLA in the 1960s. He became an acclaimed climate scientist who laid the foundations for numerical models of the atmosphere and climate, and is best known for seminal contributions to numerical methods that permit integration of the physical equations for atmospheric motions and understanding and representation of the effects of thunderstorm-scale convective motions on the larger-scale climate system. His concept of convective quasi-equilibrium informs theory and modeling of moist convective motions to this day.

In recognition of these contributions, Dr. Arakawa was awarded the Meisinger award (1967) and Carl-Gustaf Rossby Research Medal (1977) of the American Meteorological Society (AMS), the Fujiwara Award of the Meteorological Society of Japan (1991) and the Vilhelm Bjerknes Medal of the European Geosciences Union (2010).

Dr. Arakawa inspired generations of atmospheric and climate scientists. Rong Fu, AOS Professor and Vice Chair, says "in nearly a half century, he is one of the most influential scientists in modeling deep convection, both through his own scientific contribution and through producing a generation of leaders in modeling clouds and convection. Yet, he was so kind and had amazing integrity and humility. He is truly a gentle giant of the climate research community."

Dr. Arakawa passed away sleeping peacefully at home on March 21, 2021. He is survived by his wife, son, grandson and granddaughter. He loved to travel to Europe, go on cruises, and show his grandchildren around Japan.

KUO-NAN LIOU

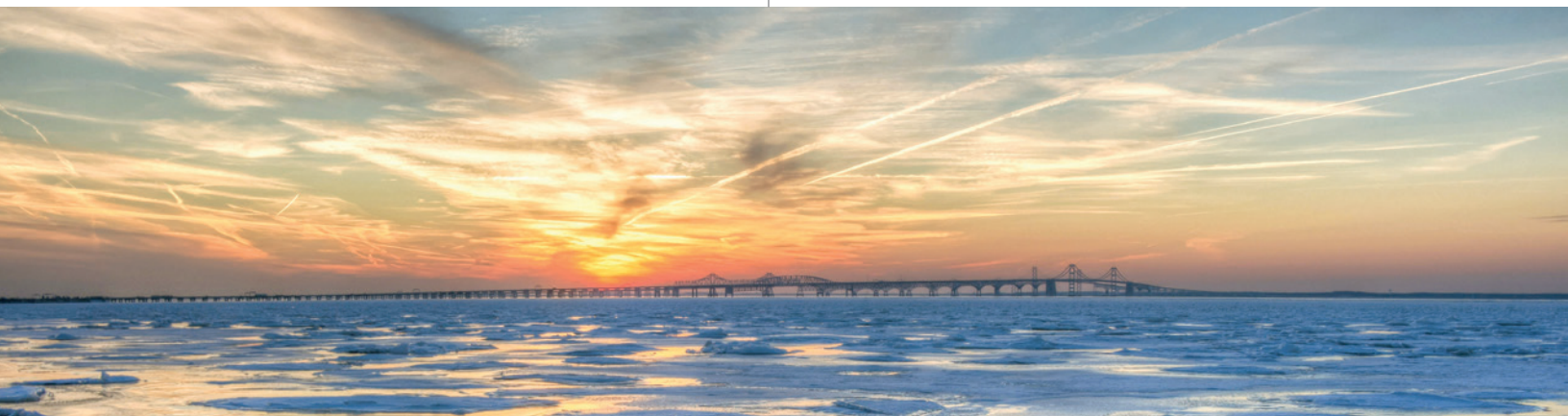
Distinguished Professor and Founding Director of JIFRESSE

Kuo-Nan Liou received his B.S. in 1965 from National Taiwan University, and M.S. in 1968 and Ph.D. in 1970 from New York University. After a 22-year career as a professor at the University of Utah, he joined UCLA in 1997 as a Distinguished Professor, served as Department Chair of AOS (2000 to 2004), and became Founding Director of JIFRESSE, a scientific collaboration between UCLA and NASA's Jet Propulsion Laboratory, in 2006.

Dr. Liou published more than 280 scientific papers and three books: "An Introduction to Atmospheric Radiation" (1980; 2002), "Radiation and Cloud Processes in the Atmosphere: Theory, Observation, and Modeling" (1992), and "Light Scattering by Ice Crystals: Fundamentals and Applications "(2016). The book "Introduction to Atmospheric Radiation," (1980; 2002) is widely used for teaching and research, having been translated into Chinese, Japanese, and Russian.

His superb accomplishments include being an elected member of the National Academy of Engineering (1999), an Academician of Academia Sinica (2004), and a Foreign Member of Chinese Academy of Sciences (2017). He was an elected Fellow of the AAAS, AGU, AMS, and the Optical Society of America. He received the AMS Jule G. Charney Award (1998), the award certificate for the Nobel Peace Prize bestowed on the IPCC for substantial contribution to the work in the area of contrails and contrail cirrus (2007), COSPAR's Biennial William Nordberg Medal (2010), the International Radiation Commission Quadrennial Gold Medal (2012), the AGU Roger Revelle Medal (2013), and the AMS Carl-Gustaf Rossby Research Medal (2018).

Dr. Liou passed away on Saturday, March 20, 2021 at his home after a brief illness. He is survived by his wife, daughter, and son.



STUDENT SPOTLIGHT

Zoe Pierrat

FOURTH YEAR PH.D. CANDIDATE

Zoe Pierrat is using remote sensing technology to understand plant productivity in the boreal forests in order to determine the future of these ecosystems. "Climate change has led to a longer potential growing season, with warmer temperatures occurring earlier in the spring, but we don't really know what this means for plants," she says. "My project addresses how we can measure the onset of photosynthesis in spring and what environmental drivers trigger the onset of photosynthesis." Her research came about from a beautiful accident and collaboration between ecologists and atmospheric chemists who discovered a "glow" coming from measurements taken over land by satellites. Armed with a new understanding that this "glow" comes from plants as they photosynthesize, Zoe and fellow researchers can measure the amount of light a plant emits, also known as solar-induced chlorophyll fluorescence (SIF), and more accurately connect this measurement to plant productivity and carbon uptake. The world's climate depends on the balance of carbon in the atmosphere and on Earth.

At UCLA, Zoe co-founded Society of Women Geoscientists (SWG), now known as Society for Gender Equity in Geoscience (SGEG), and is a member of Queer and Trans in STEM, Chi Epsilon Pi (XEP), and the Center for Diverse Leadership in Science (CDLS). Her involvement in these organizations stems from a desire for community in an academic setting where women are severely underrepresented and a passion to help create a more inclusive scientific world. Prior to UCLA, she was fortunate enough to be accepted into NSF's Research Experience for Undergraduates, which solidified her decision to pursue a career in STEM. Surrounded by a sea of scientists, she gravitated towards her advisor Dr. Jochen Stutz, an Atmospheric Chemistry Professor at UCLA, who specializes in experimental field studies and instrument development.

Under the mentorship of Dr. Stutz, Zoe and a group of researchers have installed PhotoSpec, a remote sensing instrument that measures SIF. PhotoSpec consists of a telescopic instrument on top of a tower with multiple spectrometers stationed below it to scan and relay data from incredibly small amounts of light. The data received by this spectral observer is controlled by a computer attached to the sensor and sent back to Zoe and her team to review. Through these remote sensing calculations, Zoe's team is discovering more about the complicated relationship between light, carbon, and changes in climate. The light emitted from photosynthesis can depend on both physical aspects of the measurement such as viewing direction, sun/cloud conditions, what type of plant is being studied, snow or rain fall, and ecophysiological aspects such as drought, time of year (season), and the biochemistry of the plant's needles.

The next step in Zoe's research is evaluating how direct/diffuse conditions change the signal captured by PhotoSpec. Coupled with a biochemical-radiative transfer model, these measurements will serve to inform scientists about the relationship between remote sensing and carbon uptake and how to use that information to improve climate models.

STUDENT SPOTLIGHT

De'Marcus Robinson

FOURTH YEAR PH.D. CANDIDATE

De'Marcus Robinson researches biogeochemical feedbacks in the Santa Barbara Basin's Oxygen Minimum Zone in hopes to better understand the role of benthic microbial communities in this environment. His interest in the ocean began his senior year in high school, where he took an oceanography course and learned about various oceanic phenomena. This experience piqued his curiosity and inspired him to address environmental problems in his hometown of Atlanta, GA. De'Marcus went on to major in Environmental Science with a concentration in Toxicology at Florida A&M University (FAMU).

At FAMU, Robinson was a fellow in the NOAA Educational Partnership Program with Minority Serving Institutions (EPP/MSI), where he conducted research in organic and analytical chemistry, designing a material that absorbs oil. His research on making a sorbent for oil spills on land and in the ocean was presented at numerous NOAA and EPA conferences, providing him with the skills necessary to be a successful researcher. De'Marcus also interned at USC's Center for Dark Energy Biosphere Investigations researching lake microbial productivity in the Owens River Valley Watershed, and at UCLA's Diversity Project, where he researched Turbinaria Ornata, a macroalgae in the coral reefs of Mo'orea. Considering the fact that African Americans make up less than 2% of the Marine Science population, De'Marcus says founding the Undergraduate Research Organization (URO) is one of his biggest accomplishments at FAMU. The group's mission is to further undergraduate research and bring more Black students into research to prepare them for professional and graduate education.

Backed with the skills and knowledge gained at FAMU, De'Marcus found his way to UCLA, where he combines elements of chemistry, microbiology and the ocean in his research. Under the guidance of Dr. Tina Treude, he studies geomicrobiology and biogeochemistry of the ocean and sediment. De'Marcus is a member of XEP and CDLS, where he has expanded his interests in environmental justice work. Outside of UCLA, De'Marcus is active in community service projects and organizations through the mutual aid organization Ready To Help and Phi Beta Sigma Fraternity Inc. De'Marcus has also fulfilled one of his dreams in creating BehindTheSTEAHM, a non-profit organization with the initiative to dispel the misconceptions and misinformation in science, technology, engineering, arts, humanities and mathematics. In the future, he would like to work at NOAA and eventually become a professor at a HBCU to inspire more African Americans to pursue Geoscience careers.

"Considering African Americans make up less than 2% of the Marine Science population, founding the Undergraduate Research Organization (URO) is one of his biggest accomplishments at FAMU. The group's mission is to further undergraduate research and bring more Black students into research to prepare them for professional and graduate education."

UNDERGRADUATE RESEARCH

Tamar Ervin

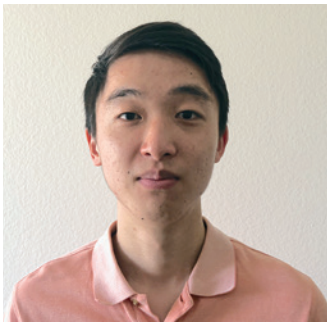
Class of 2022
Astrophysics major, AOS minor

Tamar has been interested in solar physics since she was a high school junior. Currently, she is working on a project to better understand and potentially predict solar coronal holes (CH) under the faculty supervision of Professor Bortnik. CHs are areas of cold, dark, lower density plasma in the sun's corona, important for understanding the sun's changing magnetic flux. CHs can also be the source of high speed solar wind streams causing geomagnetic storms on Earth. Tamar has created the capability to map years worth of solar data through an image correction to mapping pipeline. With these corrections, she can create uniform full-sun maps where differences in instrument data do not pose an issue to CH detection. So far she has created a supervised Convolutional Neural Network (CNN) for detection of CHs in synoptic maps, to create a detection algorithm free of any human input as to detection threshold. She is now working on a machine learning algorithm for unsupervised detection of coronal holes to remove human error. Her paper, "Coronal Hole Detection using Machine Learning Techniques" earned her the 2021 UCLA Library Prize for Undergraduate Research in Science, Engineering, & Math. After finishing her undergraduate studies, she plans to attend graduate school to continue studying topics in solar physics.

Leilani Dulgerov

Class of 2020
AOS/Mathematics B.S.

Following graduation, Leilani has been working on her capstone AOS199 project with Professor Neelin and his research group. She worked on probability distributions of precipitation clusters in the tropics in the CMIP6 model ensemble. She examined the changes to these probability distribution functions under global warming and found that models consistently showed strong increases in extreme precipitation clusters. After the initial promising results and completion of her capstone project, she joined Professor Neelin's research group as a laboratory assistant. She continues to work with them today and has completed the bulk of the required research, thus, she is arranging everything to write an article on their work. She has thoroughly enjoyed working with Professor Neelin and Fiaz Ahmed, and has learned a lot from this experience. Leilani is very excited to have this research published and plans to attend graduate school this fall.



Hamlin Liu

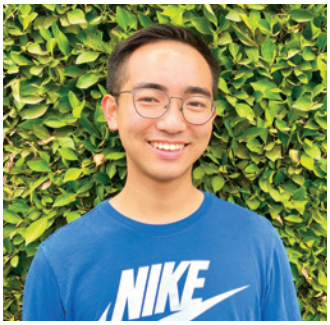
Class of 2022
Computer Science Major

Hamlin is currently focusing his curriculum around machine learning and its applications, particularly in the geosciences. He is working with Professor Bortnik doing research in applying deep learning methods with aiding in tsunami detection. Tsunamis trigger internal gravity waves which can cause anomalies within total electron content (TEC) data. These anomalies are easily picked up by GPS and GNSS satellites. In his work, they are training neural networks to detect these anomalies in the TEC data both in real time to act as another method for researchers to predict tsunamis, and historically to provide insight on past events. They have recently submitted this work as a paper for publication. Although he is not too sure of the specifics, Hamlin does know that in the future he would like to pursue research in machine learning either in industry or academia.

Melinda Berman

Class of 2021
AOS B.S., Environmental Sciences B.S.

Melinda's current research project, developing a novel algorithm to estimate burn area of wildfires from satellite active fire detections, is supervised under Dr. Saide. This project has been expanded to include machine learning applications. Using meteorological data and the burn area time series from their algorithm, they may be able to predict the burn area. Improvement in burn area estimations and the machine learning application will enable better smoke emissions predictions, improving air quality forecasting. She presented this work at the Fall 2020 AGU meeting where she won an Outstanding Student Presentation Award (OSPA). Her research experience was also featured in the Undergraduate Research Center's Student Spotlight series. In addition to her research experience at UCLA, she was an intern for the past two summers in the Naval Research Enterprise Program (NREIP) at the Naval Research Laboratory in Monterey, CA working for Dr. Peterson on quantifying stratospheric smoke aerosol mass loading from fire induced thunderstorms. As part of NREIP, she was able to participate in the 2019 NASA/NOAA field campaign studying wildfires, FIREX-AQ, as a member of the forecasting team.



Noah Alviz

Class of 2021
AOS B.S.

Noah is currently conducting research in atmospheric dynamics and climate with Dr. Chen as his faculty advisor and Weiming Ma as his graduate student advisor. Specifically, he is using reanalysis data to research seasonal trends of atmospheric rivers in the Southern Hemisphere, to understand how differences in these trends are influenced by changes in winds and moisture. He started his research journey as an intern for the Joint Institute for Regional Earth System Science and Engineering (JIFRESSE) program last summer, where he conducted statistical analyses to investigate responses of atmospheric rivers to Arctic amplification in the Northern Hemisphere. After his graduation, he took on a summer internship position within the Marine Meteorology Division of the Naval Research Laboratory in Monterey, CA. In the future, he hopes to attend graduate school, and continue growing his skills in data analysis and knowledge of meteorology particularly in climate change.

Jennifer Kosty

Class of 2023
AOS/Mathematics Major

Jennifer identifies submesoscale coherent vortices (SCVs) that are formed by leads in the Southern Ocean sea ice—long, narrow openings between sea ice floes, in her research project. SCVs are long-lived vortices that advect temperature and salinity anomalies throughout the ocean. Models show SCVs may be generated by sea ice leads; cold, high salinity water masses created by the exposure of the ocean surface to the atmosphere. The existence of these lead-generated SCVs has not been proven with in situ data, thus, she is using ARGO and MEOP data sets to identify SCVs below the sea ice in the Southern Ocean to explain their existence. Identifying SCV signatures and their origins will involve analysis of the climatological stratification in different regions of the Southern Ocean to identify anomalous water masses. These anomalies will be studied to determine if they are SCVs, and more specifically, lead-generated SCVs. This project could provide the first data-based evidence for the existence of lead-generated SCVs below the Southern Ocean sea ice. Additionally, it will be important to learn more about the role SCVs play in the polar oceans as they transport significant heat and salt anomalies over large distances. She intends to continue working on her research project and hopes to obtain a Ph.D. in oceanography after graduation, working as a researcher.

Chris La

Class of 2022
Chemistry Major

Chris's research revolves around atmospheric chemistry, ranging from topics such as the generation of reactive oxygen species, particulate matter chemistry, and kinetic modeling. When he initially began in Dr. Paulson's lab, he worked on a project to assay the reactive oxygen species generation potential of particulate matter samples across the L.A. county to determine the effect of this potential on prenatal health and adverse birth outcomes. He has also completed a kinetic model of the iron-catalyzed oxidation of dithiothreitol, which is a redox reagent commonly used in oxidative potential assays. He is currently working on a project to analyze the rapid, light-driven production of hydroxyl radicals when iron(II) reacts with organic peroxides. During his time in Dr. Paulson's lab, he became a UC LEADS Scholar, a Center for Academic and Research Excellence (CARE) Scholar, and was awarded the UCLA Regents Scholarship. In the future, he plans to attend graduate school and earn a Ph.D. in Chemistry.

Mina Deshler

Class of 2022
AOS major

Mina began doing research remotely in Fall 2020 with Dr. Saide. Her research topic is on the 2020 wildfire season in the western United States. She is interested in how wildfire smoke travels from fire sources and how this impacts air quality conditions elsewhere. One of her current focuses is comparing satellite-based Aerosol Optical Depth (AOD) observations to ground-based observations to test their accuracy during large smoke events. Additionally, she has analyzed temporal patterns in PM2.5 concentration and AOD at various distances away from fire sources, and found that there is a delayed peak in PM2.5 at several locations. She intends to continue her research and test these findings against models to see if these results can be accurately reproduced by a model. In the future, she hopes to attend graduate school and continue conducting research in atmospheric science.

Society for Gender Equity in Geoscience (SGEG)

Society for Gender Equity in Geoscience (SGEG), formerly known as the Society of Women Geoscientists (SWG), was founded in 2019 by AOS graduate students Zoe Pierrat, Jordyn Moscoso, Alex Arnold, Katie Tuite, and Earth, Planetary, and Space Sciences (EPSS) graduate student Emily Hawkins (now faculty at LMU) looking for community and support within and between the two departments. SGEG's mission is to promote and uplift women in the geophysical sciences through outreach, community building, institutional reform, and career development. This year for outreach, SGEG had a strong presence at Exploring Your Universe (EYU), UCLA's largest annual science fair, in planning the event, speaking at the event, and running booths. SGEG also partnered with a local elementary science club and connected members with additional outreach opportunities. Despite the pandemic, SGEG has been able to foster community through a buddy program and frequent paint-by-number social nights. Additionally, members have focused on career development by maintaining an active network for writing and presentation feedback on papers, fellowship statements, and other pieces of writing. SGEG was involved with planning the conference titled "Women in STEM: Breaking Barriers," from April 8th–10th, 2021, along with other women in STEM organizations at UCLA (Women in Computer Science, Society of Women in Engineering, Organization for Cultural Diversity in Science, and more). The conference aims to break socioeconomic, generational, and discipline-specific barriers that women in STEM face. Finally, SGEG members actively promote institutional reform to help foster more inclusive departments by serving on diversity and other departmental and college-wide committees. Today, the board consists of six women, three from AOS (Zoe Pierrat, Jordyn Moscoso, and Sarah Johnson) and three from EPSS (Hannah Tandy, Heather Kirkpatrick, and Elisha Jhoti). SGEG welcomes all identities and has branched out of AOS and EPSS to other departments including the Institute of Environment and Sustainability, Physics and Astronomy, Statistics and more! To learn more about SGEG, please visit https://SWG.ucla.edu/.

SGEG founders at EYU 2019 (from left to right: Alex Arnold, Emily Hawkins, Katie Tuite, Zoe Pierrat, and Jordyn Moscoso).

Chi Epsilon Pi (XEP)

XEP is a National Honor Society for outstanding students in Atmospheric and Oceanic Sciences. The student-run organization at UCLA serves to enrich the graduate and undergraduate populations at AOS. Their main goals include coordinating enriching outreach activities, creating a fair and welcoming graduate student recruitment, hosting social events that unite the students of AOS, and advocating on behalf of the students of the department.

After the switch to remote learning, XEP made student belonging their main priority. The mentorship program, led by the outreach chairs Blanca Alvarez Caraveo and Alex Arnold, matched undergrad and graduate AOS students together, sparking personal relationships and some fun combined zoom events. Graduate student Sarah Worden helped charter the "Buddy" program, which created groups of graduate students looking for connection and comradery outside of their lab and their cohort of students. This is the first year of hopefully many years of this program.

Although XEP wasn't able to coordinate some of the larger traditional events they usually host, they were still able to create wonderful moments for the AOS students in the 2020–2021 school year. In March, they hosted a scientific communication workshop with Dionne Rossiter, Director of Science at Cal Berkeley and a prominent advocate for scientific literacy. They also made and safely distributed care packages including new t-shirts to the graduate and undergraduate students of the department, and participated in virtual outreach events.

They are excited to be back to serving and welcoming AOS graduate and undergraduate students in person this fall!

AOS AWARD WINNERS

AAAS

2020 Fellow

Rong Fu—For seminal contributions to the understanding of rainfall and ecosystem interactions, and the scientific application for improving societal drought preparedness at regional scale

AGU

2020 Fellow

Rong Fu—For seminal contributions to the understanding of atmospheric convection and its interactions with ecosystems through innovative use of satellite data

Fall Meeting 2020 Outstanding Student Presentation Awards

Melinda Berman, Quantifying Burn Area of Wildfires from Satellite Active Fire Detections

Zoe Pierrat, Radiative transfer and viewing geometry considerations for the SIF/GPP relationship

Rodrigo Rodakoviski, Quasi-Lagrangian Large-Eddy Simulation of Dust Transport in the Saharan Air Layer

2021 Joanne Simpson Medal

Jacob Bortnik—For exceptional mid-career scientists who have made transformative scientific advances or breakthrough in the Earth and space sciences, have demonstrated strong leadership, and provided outstanding service to science and society

2021 Willi Dansgaard Award

Aradhna Tripati—For significant contributions to the fields of paleoceanography or paleoclimatology from a mid-career scientist within eight to 20 years of receiving their Ph.D.

2021 Ambassador Award

Aradhna Tripati—For outstanding contributions to one or more of the following areas: societal impact, service to the Earth and space community, scientific leadership, and promotion of talent/career pool

AMS

101st Annual Meeting Student Oral Presentation Awards

Yue Huang, Linking the Different Diameter Types of Aspherical Desert Dust Indicates an Underestimation of Coarse Dust Emission

2022 Nicholas P. Fofonoff Award

Andrew Stewart—For pioneering research discoveries regarding the dynamics of oceanic currents, eddies, and sea ice in polar regions

2022 Outstanding Achievement in Biometeorology

Rong Fu—For elucidating the critical role of tropical biosphere feedback mechanisms, exceptional mentorship of underrepresented groups in science, and extraordinary service to scientific societies and policymakers

2022 Fellow

Hui Su

California Academy of Sciences

2021 Fellow

Aradhna Tripati

Columbia University

Earth Institute Postdoctoral Research Fellowship

Yue Huang, "Loss of solar power generation due to aerosols in the present and later 21st-century climates"

Geochemical Society

2021 Geochemistry Fellow

Aradhna Tripati — For fundamental contributions to carbonate clumped isotope geochemistry including equilibrium and kinetic isotope fractionations, development as a paleoceanographic proxy through pioneering work on foraminifera, applications to paleoclimate, mentorship, and contributions to diversity including with the Center for Diverse Leadership in Science and service to the geochemistry and geosciences communities

NASA

2020 Ames NASA Group Achievement Award (GAA): FIREX-AQ

For outstanding scientific achievements of the Fire Influence on Regional to Global Environments Experiment—Air Quality (FIREX-AQ) airborne Earth science mission team

Saide group: Laura Thapa, Xinxin Ye, Francis Turney and Pablo Saide

Stutz group: Katie Tuite, Nathaniel Brockway and Jochen Stutz

Future Investigators in NASA Earth and Space Science and Technology (FINESST)

Sarah Worden, Identifying the Changing Moisture Sources Behind the Early Onset and Demise of the Congo Spring Rainy Season

Laura Thapa, Forecasting Wildfire Emissions with Machine Learning and Evaluating Effects on Biomass Burning Smoke Predictions

Ken Zhao, Improving Glacial Melt Rate Estimates Using ECCO (Estimating the Circulation and Climate of the Ocean) and NASA OMG (Oceans Melting Greenland)

NSF

NSF Graduate Research Fellowship Program

Zoe Pierrat

Blanca Alvarez

NSF Postdoctoral Research Fellowship

Michael Heisel, The Building Blocks of Shear-driven Atmospheric Turbulence

UCLA

2020 Academic Senate Faculty Award for Career Commitment to DEI

Aradhna Tripati

2020 Academic Senate Graduate Student DEI Award

Alex Arnold

Center For Diverse Leadership in Science Fellows

Graduate Students:

Alex Arnold
Blanca Alvarez
Paige Hoel
Jordyn Moscoso
Zoe Pierrat
De'Marcus Robinson

Faculty and Researcher Fellows:

Adeyemi Adebiyi
Rob Eagle Tripati
Alex Hall
Jasper Kok
Pablo Saide

2021 Library Prize for Undergraduate Research in Science, Engineering, & Math

Tamar Ervin, "Coronal Hole Detection using Machine Learning Techniques"

Staff Appreciation and Recognition (STAR) Award

Caitlyn Ongjoco—For exceptional contributions from staff members, going above and beyond regular work expectations to support the campus and their respective organizations

AOS Department Awards 2020

Jacob A. Bjerknes Award

Tomas Chor—For contributions in advancing the understanding and modeling of scalar transport in the oceanic surface boundary layer

Ken Zhao—For providing improved understanding of and physical constraints on oceanic heat transfer toward the Greenland and Antarctic ice sheets

Brian Lance Bosart Award

Ken Zhao—For unselfish service to fellow students and positive contributions to department life while demonstrating a firm commitment to academics

Morris Neiburger Award

Daniel McCoy—In Recognition of Excellence in the Teaching of the Atmospheric and Oceanic Sciences

Honorable Mentions: **Ken Zhao, Tomas Chor, Jordyn Moscoso, Paige Hoel**

Richard P. and Linda S. Turco Exceptional Research Publication Award

Adeyemi Adebiyi, "Climate models miss most of the coarse dust in the atmosphere"

Honorable mention: **Jinxing Li**

Richard P. and Linda S. Turco Graduate Student Fellowship

For AOS graduate students who have demonstrated exceptional progress and performance toward the completion of their PhD

Danny Leung
Gavin D. Madakumbura

Graduate Student Awardees

AOS Most Valuable Person

Geoff Girard—For outstanding service to the department, goofball attitude, endless sarcasm, and true selflessness

Carmen Gandiego

Jacob Bortnik—For engaging lectures, enthusiasm for the students, and exemplary work on the space physics committee

THE IMPACT OF GIVING

While we are incredibly thankful to many of our generous and steadfast supporters over the years, we would especially like to highlight and thank **Lawrence "Larry" W. Harding Jr. and Rich and Linda Turco** (see page 9) who have each made transformational gifts to the Department of Atmospheric & Oceanic Sciences that will profoundly impact our community in meaningful ways for generations to come.

Lawrence "Wayne" Harding

Larry Harding joined AOS as a visiting scholar in 2011 before transitioning to his current Adjunct Professor position in 2012. Since joining the faculty he has been an active and integral member of our community. Whether lecturing, volunteering for committees or personally giving to support graduate student recruitment, Larry's dedication and commitment to lifting up the AOS community has been significant.

One of the many ways Larry has uplifted the AOS community has been through two generous endowments that he has established: the **Lawrence Harding Endowed fund** in 2018 and the **Lawrence Harding Endowed Chair** in 2020. The Lawrence Harding Endowed fund provides discretionary funds so the Department Chair is able to address the department's most pressing needs, including graduate student recruitment. During the pandemic this discretionary funding was even more critically important, as it enabled the Chair to address unprecedented challenges and important time-sensitive needs for students.

The Lawrence Harding Endowed Chair (made in loving memory of Larry's father) will be established initially as a term chair in the Department of Atmospheric and Oceanic Sciences with an expertise in the field of Oceanography. Once the Chair is fully funded with an additional payment through Larry's estate, the Lawrence Harding Endowed Chair will grow substantially to provide salary support for the chair holder. Once this happens it is Larry and AOS's hope that the chair will be used as a recruitment tool for a new faculty member in the field of Oceanography. This incredible gift marks a new era for the Department of Atmospheric and Oceanic Sciences, as it establishes the first endowed Chair with salary support in the history of the department!

DEAN'S GIFT MATCHING FUNDS

UCLA Physical Sciences Dean Miguel García-Garibay is dedicating resources to inspire others to give through the Physical Sciences Matching Gift Program. This program is aimed at significantly transforming the future of UCLA Physical Sciences through endowed support. We recognize the urgency to address social justice priorities and the critical need to increase the diversity of our faculty, staff and student body. A broader pool of talent fosters greater scientific accomplishments and empowers underrepresented communities that significantly benefit our society. As a commitment to these efforts, gifts in support of diversity, equity and inclusion will be considered at a more significant match.

DIVERSITY, EQUITY AND INCLUSIVITY

Qualifying gifts of $100,000 to $1 million to any Physical Sciences endowment aimed at increasing diversity, equity and inclusivity within the division will be matched at 100%.

OTHER ENDOWMENTS

Qualifying gifts of $100,000 to $1 million to all other Physical Sciences endowments will be matched at 50%.

There are limited funds for the Dean's Matching Program that are available on a first-come, first-served basis. If you are interested in learning more about how you can establish your legacy through an endowment that will help ensure the Department of Atmospheric & Oceanic Sciences remains one of the top departments in the country for decades to come, please contact **Amber Buggs** at amberbuggs@support.ucla.edu or **(310) 994-5782**.

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Helen and Lance Bosart
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Kwo Ray Chu
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