



News | Spring 2024

Chair's Message:

Dear Alumni and Friends,

With this newsletter, it is my pleasure to present you an update on the Mechanical & Aerospace Engineering (MAE) Department in the still on-going 2023-24 academic year.

First, I am excited to welcome Professors [Anya Jones](#) and [Anushri Dixit](#), the two new additions to our faculty ranks. Professor Jones comes from a previous position as Professor of Aerospace Engineering at the University of Maryland. She is a fluid dynamicist with a focus on experimental and theoretical aerodynamics. Assistant Professor Dixit received her Ph.D. from Caltech in 2023 and is currently a post-doc at Princeton. Her research areas center on motion planning and control of robots in unstructured environments.



Meanwhile, we also welcome a new class of students in our various undergraduate and graduate degree programs in Mechanical and Aerospace Engineering. With the continuing high interest in the MAE majors, I am proud that we are attracting excellent students with outstanding credentials while mindful of our responsibility to provide them with a world-class education, research opportunities, and experience.

As a leading MAE Department in the country and around the world, our faculty and students conduct trailblazing research in broad interdisciplinary areas of Mechanical and Aerospace Engineering from rockets and spacecraft, to robots, bio-engineering devices and advanced materials, to energy and sustainability. This newsletter offers a small window showcasing some of the exciting new activities and accomplishments of our students, faculty members, and alumni.

Finally, I would like to take this opportunity to update you on an [urgently needed project](#) to upgrade the department's space and infrastructure to meet the research and teaching needs of a modern MAE department. Your help to make it happen is greatly

appreciated.

Go Bruins! Thank you.

Sincerely,

Xiaolin Zhong, Professor and Chair

FACULTY SPOTLIGHTS

FACULTY SPOTLIGHT: Kunihiro “Sam” Taira

Mechanical and Aerospace Engineering (Chair: Prof. Xiaolin Zhong)

Principal Investigator: Kunihiro “Sam” Taira
Computational and Data Driven Fluid Dynamics Group

- Extremely/unsteady aerodynamics
- Reduced order modeling
- Active flow control
- Machine learning analysis



UCLA Samueli School of Engineering

FACULTY SPOTLIGHT: Tim Fisher

Mechanical and Aerospace Engineering (Chair: Prof. Xiaolin Zhong)

Principal Investigator: Tim Fisher
Group website: 883.8888.8888.8888

- Research: New concentrated solar technology to make clean hydrogen and gasoline from methane → sunlight (9/20/23, 9/20/23, 9/20/23)
- Honored during the Climate Change conference (12/21/23) (1/23 selected out of 3000 applicants)
- Received new solar heat absorber patents in CA and AZ (2/18/23, 2/18/23, 2/18/23)
- 2/18/23 Dept. of Energy, 1 CA Energy Commissioner
- Mapping projects in hydrogen and electronics cooling
- Service & Teaching
 - Named UCLA campus-wide Faculty Director for the UC LEADS program - 2 year (2022-2024) experience across UC systems
 - Named Editor in Chief of top 40 IEEE specialized journal in the field (Journal of Heat and Mass Transfer)
 - Teaching innovations in thermodynamics and heat transfer curricula



UCLA Samueli School of Engineering

FACULTY SPOTLIGHT: Dennis Hong

Mechanical and Aerospace Engineering (Chair: Prof. Xiaolin Zhong)

Principal Investigator: Dennis Hong
RoMeLa, Robotics & Mechanisms Laboratory - www.RoMeLa.org

- Developed ARTEMIS, one of the most advanced humanoid robots in the world
- ARTEMIS is the fastest/humanoid robot in the world at 2.1 m/s, and the first running humanoid from a stadium
- Bill Gates invited the team to see ARTEMIS which was published on "Gates Notes"
- First Place at the 2023 Int. Humanoid Locomotion Competition at the IEEE Humanoids Conf.
- Won 3rd Place at "RoboCup 2022" held in Bordeaux, France, July 4 - 10, 2022



UCLA Samueli School of Engineering

FACULTY SPOTLIGHT: Yongjie Hu

Mechanical and Aerospace Engineering (Chair: Prof. Xiaolin Zhong)

Principal Investigator: Prof. Yongjie Hu Group website: hu.888888.ucla.edu

Our recent innovation was selected as the "Top 10 Semiconductor Stories of 2023" by IEEE

Invention of Solid-State Thermal Transistor

- Revolutionizing Future Technologies for Dynamic Thermal Management
- Developed a first-of-its-kind solid state thermal transistor
- Demonstrated high speed, and energy, and reversibility across millions of cycles
- Perfected first-principles theory and an alloy spectroscopy to confirm new physics
- Provided a game-changing solution for 3D chip packaging
- Opened numerous opportunities for precise control of thermal current and in advanced thermal management, 3D chip packaging, and energy technologies
- Filed in 10 patents
- UCLA Samueli being highlighted by 100+ news media and research posts
- UCLA's special leverage in international competition for next-generation semiconductor

Research published in Science Magazine

UCLA News: <https://news.ucla.edu/2023/08/01/thermal-transistor/>

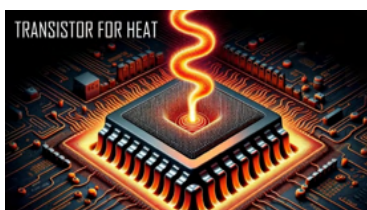
News Highlights

- "UCLA's Innovation in Thermal Transistor" (IEEE Spectrum)
- "UCLA's Special Leverage in International Competition for Next-Generation Semiconductor" (IEEE Spectrum)
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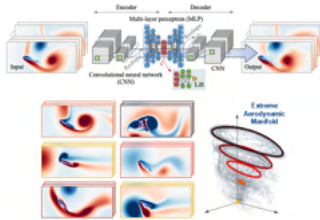
UCLA Samueli School of Engineering

FACULTY IN THE NEWS



Professor Yongjie Hu and Team Invent a First-of-its-Kind Thermal Transistor to Transform the Paradigm of Dynamic Heat Management

MAE Professor Yongjie Hu led a research team that has unveiled a first-of-its-kind solid-state thermal transistor that uses an electric field to control a semiconductor device's heat movement with unprecedented performance.



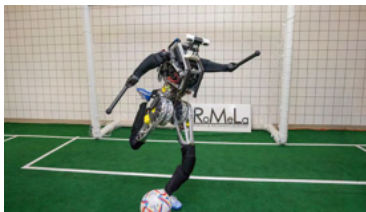
[Kai Fukami and Kunihiko Taira reveal a low-rank manifold of extreme aerodynamics with machine learning and computational fluid dynamics](#)

UCLA MAE Ph.D. student Kai Fukami and his supervisor Professor Kunihiko Taira have recently discovered a low-dimensional manifold that captures the dynamics behind a wide range of extreme aerodynamic scenarios with spatiotemporal high degrees of freedom by leveraging machine learning and computational fluid dynamics.



[UCLA Engineers Unveil Algorithm for Robotic Sensing and Movement](#)

Led by project investigator and assistant professor of mechanical and aerospace engineering Brett Lopez at the UCLA Samueli School of Engineering



[Dennis Hong's ARTEMIS highlighted by Reuters, others](#)

The second largest wire service in the world highlighted Dennis Hong, a professor of mechanical and aerospace engineering and director of the Robotics and Mechanisms Laboratory, on his full-sized humanoid robot.



[Combining Surgery and Robotics to Design Bionic Implants](#)

Award-winning UCLA engineer Tyler Clites aims to improve human mobility.



[Fire Prevention and Safety \(FP&S\) Grant Program Research and Development \(R&D\) Activity](#)

Professor Spearrin leads multi-university FEMA project to create and test new field-deployable gas sensors that provide timely and quantitative assessment of fire toxicity, with a specific focus on structural fires and overhaul operations



[Center for Translational Applications of Nanoscale Multiferroic Systems Celebrates 10 Years of Innovation](#)

Over the past decade, the multi-institutional Center for [Translational Applications of Nanoscale Multiferroic Systems \(TANMS\)](#) funded by the National Science Foundation has made big strides in its efforts to control magnetism in tiny magnetic devices.



[Professor CJ Kim Featured in IEEE EDS Podcast Series with Luminaries](#)

Chang-Jin “CJ” Kim, a distinguished professor of mechanical and aerospace engineering, outlines his life and career, from his childhood in South Korea to today.



[Microsoft co-founder Bill Gates met with UCLA Prof. Dennis Hong, director of RoMeLa, to discuss robots on Gates Notes](#)

Microsoft co-founder Bill Gates met with UCLA Prof. Dennis Hong, director of RoMeLa, to discuss how robots can play a critical role in improving health care, hospitality, agriculture, manufacturing and construction.

FACULTY AWARDS



[Distinguished Professor and Dean Emeritus Vijay Dhir Named to European Academy of Sciences and Arts](#)

Founded in 1990 and headquartered in Austria, the non-governmental association brings together more than 2,000 leading scholars and practitioners — among them 32 Nobel Prize winners from across Europe — who are elected for their achievements in science, arts and governance. They are grouped into seven classes and Dhir will be a member of its technical and environmental sciences cohort.



[Jeff Eldredge selected for UCLA's 2024 Distinguished Teaching Award](#)

The Distinguished Teaching Award Selection Committee has selected Professor Eldredge for this year's Distinguished Teaching Award for Senate Faculty.



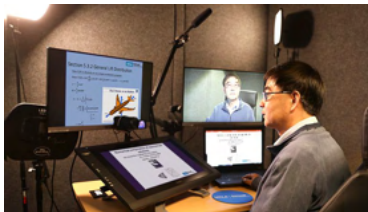
[Lihua Jin awarded the 2023 ASME Sia Nemat-Nasser Early Career Award](#)

Prof. Jin was selected to receive the 2023 ASME Sia Nemat-Nasser Early Career Award "for unraveling coupled non-equilibrium processes in stimuli-responsive soft materials to achieve programmable shape morphing and actuation, developing novel mechanical metamaterials for reusable energy absorption and reversible shape transformation and furthering understanding of the stretchability of electronic materials and devices."



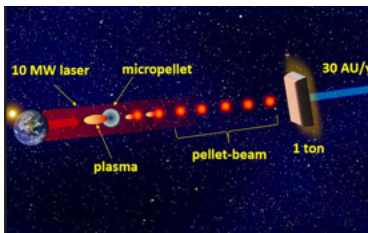
[Brett Lopez receives 2022-23 MAE Outstanding Faculty Teaching Award](#)

MAE Awards and Honors Committee has selected Professor Brett Lopez to be the recipient of the 2022-23 MAE Outstanding Teaching Award.



[UCLA Samueli School of Engineering Online Master's Program Ranked No. 1 by U.S. News & World Report](#)

The online master's degree program at the UCLA Samueli School of Engineering has again been ranked No. 1 by U.S. News & World Report.



[Artur Davoyan's concept selected by the NASA Innovative Advanced Concepts \(NIAC\) Program](#)

A project from UCLA's Artur Davoyan, meanwhile, could speed up missions to the outer edge of the Solar System and even interstellar space.



[UCLA Professor Receives Biomedical Engineer Society Rising Star Award](#)

Neil Lin, an assistant professor of mechanical and aerospace engineering as well as bioengineering at the UCLA Samueli School of Engineering, has received a 2024 [Rising Star Junior Faculty Award](#) from the Biomedical Engineering Society (BMES) Cell and Molecular Bioengineering (CMBE) Special Interest Group.



[2 UCLA Engineers Named to 2023 National Academy of Inventors](#)

Eric P. Y. Chiou — a professor of mechanical and aerospace engineering — and Paul Weiss — a distinguished professor of chemistry and biochemistry, and materials science and engineering — at the UCLA Samueli School of Engineering have been elected as fellows of [the National Academy of Inventors \(NAI\)](#).



[UCLA Engineering Professor Elected American Physical Society Fellow](#)

[Pirouz Kavehpour](#), a professor of mechanical and aerospace engineering at the UCLA Samueli School of Engineering, has been elected a fellow of the American Physical Society.



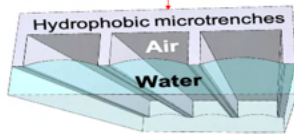
[Professor M'Closkey Mechatronics Paper Awarded](#)

"An electrostatically suspended contactless platform," Mechatronics 80 (2021), received the International Federation of Automatic Control Mechatronics Paper Prize 2020-2022. The award was presented at the Awards Ceremony of the IFAC 2023 Congress in Yokohama, on Friday July 14, 2023.



[Team RoMeLa wins the “2023 International Humanoid Locomotion Competition” held at the International IEEE Humanoid Conference 2023 \(Austin, TX, Dec 12-14\) with the world’s fastest humanoid robot ARTEMIS developed at RoMeLa](#)

Professor Dennis Hong and his RoMeLa team win with the world’s fastest humanoid robot ARTEMIS.



[Professor CJ Kim, in collaboration with UCSB, awarded a \\$1M research award from the Defense Advanced Research Projects Agency \(DARPA\)](#)

Managed by the Defense Science Office (DSO) of DARPA, the funded research is to help reduce hydrodynamic drag of ships that will increase speed, extend endurance, reduce fuel usage, and tame emissions.

ALUMNI/STUDENTS IN THE NEWS



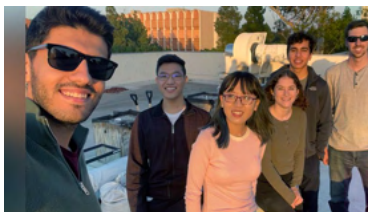
[Huang named dean for the College of Engineering, Architecture and Technology](#)

Alumni Dr. Hanchen Huang graduated with a Ph.D. from our MAE Department in the 1990s. His former PhD advisor is Emeritus Professor Nasr Gohniem.



[Race to the Finish](#)

Bruin Racing, the umbrella campus organization divided into four “teams” that build and race various zippy vehicles, has brought together students and faculty advisers to design and manufacture three testbed cars a year: a Formula for speed, the Baja for off-roading endurance, and a Supermileage for fuel efficiency.



[UCLA Engineering Student Leads Portable Solar Panel Project to Improve Accessibility](#)

Third-year mechanical engineering Ph.D. student at the UCLA Samueli School of Engineering, Chen Zhang continues to ask tough questions about electricity generation — but she also aims to be part of solutions that focus on sustainable and accessible renewable energy.



[3D Printing for Everyone: UCLA Club President and Mechanical Engineering Senior on Diversifying STEM](#)

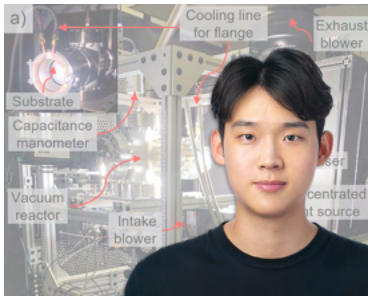
Jacobi Gunsalus wants to engineer an equitable future for everyone by fostering a creative and inclusive community at the student-run UCLA chapter of 3D4E — 3D printing and modeling for everyone.



[UCLA Aerospace Engineering Senior Builds, Launches Rockets and More](#)

Rising fourth-year student at the UCLA Samueli School of Engineering, Anjali Koganti, reached yet another milestone on her journey to become an aerospace engineer as a 2023 Brooke Owens Fellow and a summer intern at The Aerospace Corporation.

STUDENT AWARDS



[Min Jong Kil wins Itherm Best Paper Award](#)

Min Jong Kil, a 2nd year ME Ph.D. student in [UCLA MAE Professor Tim Fisher's Nanoscale Transport Research Group](#) lab, won the [Itherm Best Paper Award](#).



[Vedasri Godavarthi awarded a Zonta International Amelia Earhart \(AE\) Fellowship for the 2023-2024 academic year](#)

The Zonta International Amelia Earhart Fellowship is awarded to about 30 women a year pursuing Ph.D. in Aerospace Engineering. Godavarthi has been working on very challenging high-speed unsteady flow problems.



[UCLA Engineering Student Earns NASA Grant for Research in Heat Transfer Technology](#)

Zachary Wong '20, M.S. '22, a mechanical engineering Ph.D. candidate at the UCLA Samueli School of Engineering, received a [2022 NASA Space Technology Graduate Research Opportunities grant](#) for his research on oscillating heat pipes, which disperse heat to regulate system temperatures.



[UCLA Engineering Students Receive 2023 NSF Graduate Research Fellowships](#)

Mechanical Engineering student, John McCullough of Professor Clites' lab, received the prestigious [2023 Graduate Research Fellowship](#) from the National Science Foundation.

INTRODUCTION OF 2 NEW FACULTY MEMBERS



[Anushri Dixit](#)

Anushri Dixit received her Ph.D. in Control and Dynamical Systems from California Institute of Technology in 2023 and her B.S. in Electrical Engineering from Georgia Institute of Technology in 2017. She is currently a Postdoctoral Researcher in the Department of Mechanical & Aerospace Engineering at Princeton University. Her research focuses on motion planning and control of robots in unstructured environments while accounting for uncertainty in a principled manner. Her work on risk-aware methodologies for planning has been deployed on various robotic platforms as a part of Team CoSTAR's effort in the DARPA Subterranean Challenge. She has received the Outstanding Student Paper Award at the Conference on Decision and Control, Best Student Paper Award at the Conference of Robot Learning (as a co-author), and was selected as a Rising Star in Data Science by The University of Chicago.



[Anya Jones](#)

Anya Jones is a fluid dynamicist with a focus on experimental and theoretical aerodynamics, unsteady and separated flows, and vortex dynamics. Much of her research aims to better understand the fundamental flow physics and mechanisms behind aerodynamic force production in unsteady environments including large-amplitude gust encounters, extreme vehicle maneuvers, flight through wakes, flapping wings, and separated and reverse flow on high advance ratio rotors. She has chaired several NATO Science & Technology Organization task groups on the unsteady aerodynamics of wing-gust response and mitigation and has held visiting positions at the Technion in Haifa, Israel as a Fulbright Scholar; TU Braunschweig in Germany as an Alexander von Humboldt Research Fellow; and Tohoku University in Japan as a Visiting Professor.

Dr. Jones is joining UCLA from a previous position as Professor of Aerospace Engineering at the University of Maryland, College Park, where she directed the Separated and Transient Aerodynamics Laboratory and was a member of the Alfred Gessow Rotorcraft Center and the Maryland Robotics Center. She is an Associate Fellow of AIAA and has been awarded the Presidential Early Career Award for Scientists and Engineers (PECASE) as well as the AFOSR Young Investigator Award and NSF CAREER Award. She received her PhD in Engineering from the University of Cambridge, her S.M. in Aeronautics and Astronautics from MIT, and her B.S. in Aeronautical and Mechanical Engineering from Rensselaer Polytechnic Institute.

INDUSTRY OUTREACH NEWS



During the current academic year the MAE Department has been actively pursuing enhanced connections to industry partners, including partners at national laboratories and FFRDCs. Thus far we have held two meetings of our [MAE Industrial Advisory Board \(IAB\)](#): a Zoom-based meeting on December 13, 2023, and an in-person meeting on March 1, 2024, which coincided with our MAE Graduate Student Open House for newly admitted students. For each of the IAB meetings, the department welcomed over 25 organizational representatives, and we are delighted with their active engagement and helpful comments and discussions, especially at the strategic level. At the in-person meeting on March 1, IAB members heard presentations by a number of faculty and students, and were able to learn in detail about a range of MAE research activities as well as undergraduate student group projects during our impactful poster session, involving over 40

poster presentations by students and postdocs.

Separately from the IAB, the MAE Department is actively seeking industry support through its **Industrial Affiliates (IA) program**, where numerous benefits may be provided to organizations that contribute to UCLA MAE and its students, including scholarships and unrestricted funding. Please contact MAE Industry Outreach Chair Ann Karagozian (ark@ucla.edu) to discuss the various ways that your company can give to the UCLA MAE Department and how your gift will be used to support the highest quality of teaching and research.

HELP NEEDED: DEPARTMENT CENTER PROJECT FUNDING OPPORTUNITIES



*MAE Faculty Suite
Modernization: Past (Before July 2023)*

One of my goals as the new Chair of the MAE Department is to upgrade the infrastructure of the department to meet the new challenges and opportunities of our time. The most pressing item is the modernization of the old, outdated, and cramped departmental office suite on the 4th floor of Engineering 4, which has served the department for the last four decades. We urgently need a modern department center to serve as a converging point for the faculty, students, and staff to work, collaborate, and innovate.



*MAE Faculty Suite
Modernization: Now (April 2024)*

We have started the project in the Summer of 2023 by removing the old cubicles, painting the walls, and installing new flooring. The next step is to build a new center envisioned in the attached picture with workstation areas and two glass-walled conference rooms: a smaller meeting room for faculty/staff/students/visitors and a larger innovation/brain-storming room for students and a conference room for the faculty and staff. The new suite will be the new center of the MAE Department befitting of a major MAE Department in the world.



*MAE Faculty Suite
Modernization: Future (2025+)**

The accomplishment of this ambitious vision would not be possible without your generous support. Our top priority is to fund the construction of the two conference rooms, and there are naming opportunities available for both rooms. If you would like to learn more or support this project, please contact me at xiaolin@seas.ucla.edu. Your generosity is greatly appreciated.

**Courtesy of Tangram*

UCLA Samueli

Mechanical & Aerospace Engineering

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