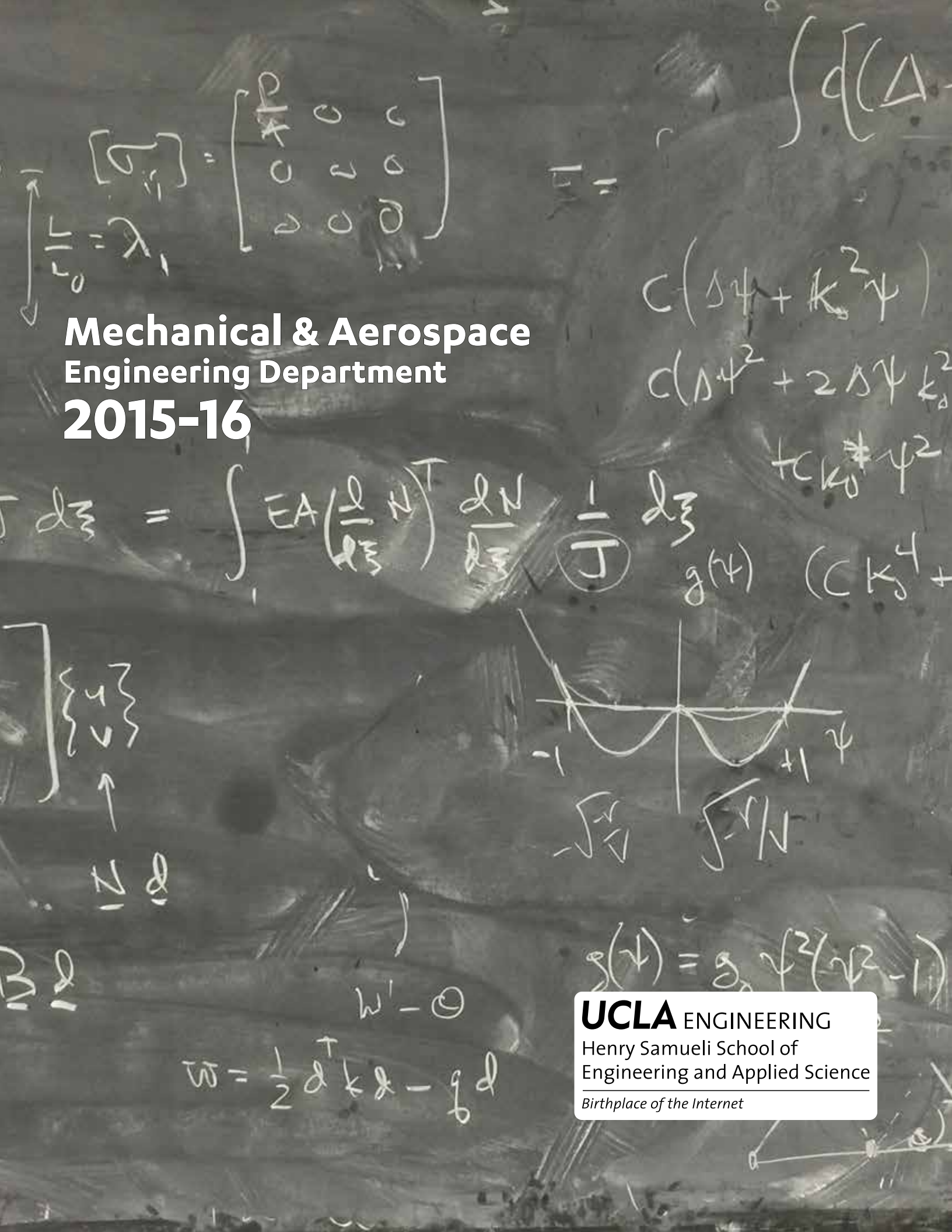

Mechanical & Aerospace
Engineering Department
2015-16

UCLA ENGINEERING
Henry Samueli School of
Engineering and Applied Science

Birthplace of the Internet

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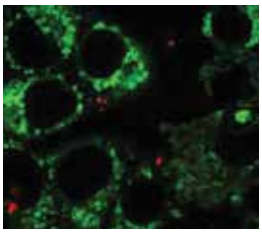
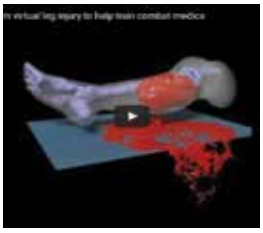
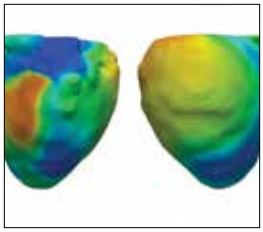






UCLA MAE ANNUAL REPORT 2015-16

Cover and back image: William Klug's office chalkboard.

Thanks to all that contributed to the Klug Family Fund.

Thanks to all who contributed to this report.

Designed and edited by Alex Duffy.

Chair's Message

Welcome to the HSSEAS Department of Mechanical and Aerospace Engineering

Welcome to UCLA's Department of Mechanical and Aerospace Engineering at the Henry Samueli School of Engineering and Applied Science.

The College of Engineering was opened in 1945 with an initial cohort of 379 students. In 1969 the College became the School of Engineering and Applied Science to better address the upward shift in education level of engineers and the crucial role of the engineer in society. The School was organized into seven departments, one of which has become today's Department of Mechanical and Aerospace Engineering. The common thread woven throughout the history of MAE at UCLA is excellence in education and research.

MAE is undergoing a major expansion. With the completion of Engineering VI, we are expanding the size of our faculty and will be accepting a significantly increased number of our truly outstanding undergraduate and graduate school applicants.

Mechanical Engineering is the broadest of the engineering disciplines. Mechanical engineers design, fabricate, and test all types of devices and systems that draw from expertise that is applicable from nano technology to space vehicles, and from sustainable electrical power generation to medical technology. The mechanical engineer incorporates concepts from mechanical, thermal, and fluid systems implemented in software-controlled hardware solutions. MEs provide the foundation of the engineering discipline, work in every industry including transportation, energy, electronics, bioengineering, and manufacturing, and move into major leadership roles in industry, government, and academia throughout their careers.

Aerospace Engineering has considerable overlap with Mechanical Engineering, but in addition AEs understand the many complexities associated with air and space based systems.

Mechanical and Aerospace Engineering research at UCLA is truly world class. Within the MAE department you will find a major robotics thrust, joint air and space programs with AFRL and JPL, sustainable energy and smart grid research, and the NSF-TANMS nanotechnology engineering research center. Housed adjacent to the California NanoSystems Institute and the UCLA Medical School, MAE researchers are on the forefront of the development of new technology in these areas.

Christopher S. Lynch
Chairman

The research activities of our faculty and students are broad, and the size of our growing program provides challenging experiences for our students in areas beyond the typical core of mechanical engineering programs. Multi-disciplinary programs abound, and the research experience of our faculty is reflected in the classroom experience, enabling our ME students and graduates to go out and address the world's grand challenges.

— Christopher S. Lynch

Dean Jayathi Murthy

Dean and Professor Jayathi Murthy has joined UCLA's Mechanical and Aerospace Engineering Department. Dean Murthy's field of research is heat and mass transfer.

Jayathi Y. Murthy became the seventh dean of the UCLA Henry Samueli School of Engineering and Applied Science on January 1, 2016.

Before joining UCLA Engineering, Murthy was chair of the Department of Mechanical Engineering at the University of Texas at Austin, and held the Ernest Cockrell Jr. Memorial Chair in Engineering. Consistently ranked as one of the top mechanical engineering departments in the country, the department has 66 faculty members and approximately 1,500 students.

Jayathi Y. Murthy

From 2008 to 2014, Murthy served as the director of the Center for Prediction of Reliability, Integrity and Survivability of Microsystems (PRISM), a $21 million center of excellence supported by the National Nuclear Security Administration (NNSA).

Prior to joining the University of Texas at Austin, Murthy was the Robert V. Adams Professor of Mechanical Engineering at Purdue University from 2008 to 2011. Before joining Purdue, she was a professor of mechanical engineering at Carnegie Mellon University in Pittsburgh.

From 1988 to 1998, Murthy worked at New Hampshire-based Fluent, Inc., a developer and vendor of the world's most widely used computational fluid dynamics software. She led the development of algorithms and software that still form the core of the company's products.

Murthy began her career at Arizona State University, where she was an assistant professor of mechanical and aerospace engineering from 1984 to 1988.

Her research interests include nanoscale heat transfer, computational fluid dynamics, and simulations of fluid flow and heat transfer for industrial applications. Her recent research has addressed sub-micron thermal transport, multiscale multiphysics simulations and uncertainty quantifications.

Murthy received a Ph.D. in mechanical engineering from the University of Minnesota, an M.S. from Washington State University and a B. Tech from the Indian Institute of Technology, Kanpur. She is a fellow of the American Society of Mechanical Engineers and the author of more than 280 technical publications. She serves on the editorial boards of Numerical Heat Transfer and the International Journal of Thermal Sciences. She is an editor of the second edition of the Handbook of Numerical Heat Transfer.

Mitchell Spearrin

Assistant Professor Mitchell Spearrin has joined UCLA's Mechanical and Aerospace Engineering Department. Prof. Spearrin's field of research is both fluid mechanics and heat and mass transfer.

Prof. Spearrin's research focuses on spectroscopy and optical sensors, including laser absorption and fluorescence, with experimental application to advanced propulsion, energy systems, and other dynamic flow fields. Recent projects have included spatially and temporally resolved measurements in supersonic combustion (i.e. scramjet) flows and detonation-based engines, where new performance metrics were developed to understand and advance these systems. Future propulsion research is aimed toward experimental investigation of systems that operate at supercritical conditions, as is the case for most rockets, and the underlying spectroscopy and kinetics associated with those reacting flows. Dr. Spearrin completed his Ph.D. at Stanford University, working in the High Temperature Gas Dynamics Laboratory. Prior to his academic career, Dr. Spearrin worked for Pratt & Whitney Rocketdyne in Los Angeles as a combustion devices development engineer. Prof. Spearrin is currently looking for highly motivated students to join his new laboratory at UCLA.

Mitchell Spearrin

BASIC SCIENCE

Fundamental collisional and radiative processes determine the intensity and structure of observed spectra for a given atom or molecule and are dependent on thermodynamic conditions. In our laboratory, we investigate these basic mechanisms using laser spectroscopy in optical gas cells and high-temperature furnaces, providing insight into physical behavior at the molecular level at conditions relevant to sensing applications of interest. Fundamental spectroscopic constants can be determined experimentally and integrated into spectral models or more comprehensive databases.

EXPERIMENTAL METHODS

Rapid advances in photonics equipment provide for constant opportunities to expand experimental capabilities using laser spectroscopy. Increasing power, efficiency, tunability range, tuning speed, and wavelength coverage of lasers can provide for new methods. In our lab, we investigate significant extensions of existing techniques and entirely new methods that involve increasing temporal, spatial, and spectral dimensions/resolution by way of absorption and fluorescence interactions.

ENGINEERING APPLICATIONS

Laser spectroscopy is particularly well-suited to sensing applications that require high time-resolution (or fast response time) and non-intrusive detection. These technical requirements are typical of reacting flow fields where the time scales of chemistry are very short (microsecond to millisecond) and where intrusive probes can alter the parameters of interest. High-speed flows, with steep spatial and temporal flow-field gradients, have analogous diagnostic needs. More diverse applications of our sensing methods are unified by the need for quantitative, time-sensitive information required to understand complex, dynamic systems that typically involve competing flow-field mechanisms.

Mohamed Abdou: UCLA Fusion Science and Technology Center will help Korea develop

L to R: Mu-Young Ahn, Alice Ying, Flora O'Brien, MAE Prof. Mohamed Abdou, HSSEAS Dean Jayathi Murthy, Dr. Seungyon Cho, MAE Chair Christopher Lynch.

UCLA and the National Fusion Research Institute (NFRI) in Korea agreed to an additional four years of collaboration. NFRI will provide the UCLA Fusion Science and Technology Center (FSTC) with funds and materials. UCLA FSTC will help NFRI develop an advanced breeding blanket based on a helium-cooled lithium-based ceramic pebble bed concept. The UCLA FSTC effort will involve carrying out experiments in the state-of-the art facilities in the FSTC laboratory as well as modeling, design, and analysis. The blanket will simultaneously extract energy and breed tritium utilizing neutrons produced in the fusion reaction. The ultimate objective of the joint UCLA-NFRI collaborative research agreement is to enable Korea to develop the blanket concept and build a prototype to test in ITER. The ITER Project is being constructed in Southern France as a collaborative project between EU, Japan, USA, China, Korea, India, and Russia. ITER will demonstrate the principles of fusion energy and produce 500 MW of fusion power. ITER is the largest science project ever and is a unique model of international collaboration. The new 4-year collaboration builds on the success and outstanding accomplishments of the past 3 years between NFRI and UCLA FSTC.

A ceremony was held on August 1st at UCLA to sign the extended agreement. It was attended by a delegation from NFRI and the Korea Atomic Energy Research Institute and led by Dr. Seungyon Cho, Head of the Systems Division in ITER-KOREA. UCLA was represented by Dean Jayathi Murthy; Prof. Mohamed Abdou, director of the UCLA Fusion Science and Technology Center; and Prof. Chris Lynch, chair of the Mechanical & Aerospace Engineering Department. The festive signing ceremony was attended by key representatives from OCGA, invited guests, and researchers and graduate students from the fusion center.

Greg Carman: Named IEEE Magnetics Society Distinguished Lecturer

Greg Carman

TANMS Center Director, Greg P. Carman, was named as 2016 IEEEMagnetics Society Distinguished Lecturer. Here is an excerpt from his presentation "Magnetics + Mechanics + Nanoscale = Electromagnetics Future"

Efficient control of small scale magnetism presents a significant problem for future miniature electromagnetic devices. In most macroscale electromagnetic systems we rely on a discovery made by Oersted 200 years ago where an electrical current through a wire creates a distributed magnetic field. While this concept works well at large scale, it suffers significant problems at volumes below 1 mm3. One approach to control nanoscale magnetic states is spin-transfer torque (STT). However, experimental measurements on STT memory devices indicates that 100 fJ is required to reorient a bit of memory with an energy barrier of about 0.5 aJ, i.e., at 0.0005 percent efficiency. Therefore, new nanoscale approaches are needed for future miniature electromagnetic devices.

Recently, researchers have explored strain-mediated multiferroic composites to resolve this problem. For this material class, a voltage-induced strain alters the magnetic anisotropy of the magneto-elastic elements. These strain-mediated multiferroics consists of a piezoelectric material coupled to magneto-elastic elements to transfer electrical energy to magnetic energy through a mechanical transduction. The coupling coefficient (energy transferred) in piezoelectric materials (e.g., lead zirconate titanate, PZT) is approximately 0.8 while the coupling coefficient in magneto-elastic materials (e.g., Tb-Dy-Fe, Terfenol-D) is of similar magnitude, 0.8. Thus, the amount of energy to overcome a 0.5 aJ bit barrier is potentially only 0.8 aJ, or an efficiency of about 60 percent, neglecting line losses.

Yong Chen: UCLA to play role in developing shape-shifting wings for aircraft

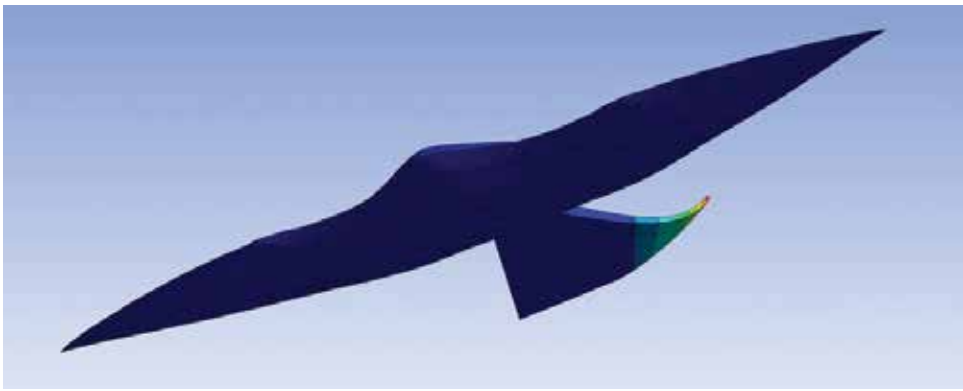
An international team of engineers and biologists will gain unprecedented insights into how birds fly so efficiently in order to design unmanned aircraft with shapeshifting wings. These planes may prove to be lighter, faster and far more maneuverable than today's stiff-winged aircraft.

Researchers have received a $6 million grant from the Air Force Office of Scientific Research to produce the most detailed analysis of bird flight ever made for an aerospace engineering project. The project is headed by Daniel Inman, a professor of aerospace engineering at the University of Michigan, and UCLA MAE Professor Yong Chen.

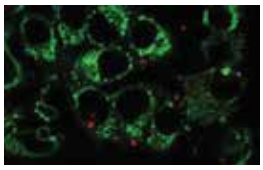
While modern, rigid-wing airplanes use drag-inducing flaps and slats for control, birds manipulate individual feathers or clusters of feathers on their wings, creating surfaces that control flight without wasting energy.

"A biological neural network can process signals at a speed comparable to a supercomputer while weighing only one millionth as much and consuming one millionth the power," said Chen, who also has an appointment in the UCLA Department of Materials Science and Engineering. Chen's brain-like circuits will be able to quickly and efficiently process information from the sensors, using it to choose the best wing shapes to maneuver the aircraft.

Yong Chen



Pei-Yu Chiou: UCLA-led team develops new method to study mitochondrial DNA diseases



Cell membranes

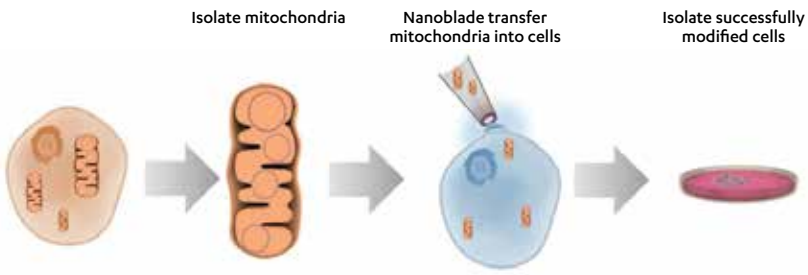
To address complex issues surrounding mtDNA alterations, UCLA researchers, led by Dr. Michael Teitell, Director of Basic and Translational Research in the Jonsson Comprehensive Cancer Center, and MAE Professor Pei-Yu (Eric) Chiou, collaborated on a new precision cutting tool.

The tool, a "photothermal nanoblade," opens holes in the outer membrane of a cell to enable pressurized delivery of desired contents, in this case healthy mitochondria, into the cell cytoplasm.

"Our photothermal nanoblade can open a micron-sized pore through a cell membrane by utilizing an ultrafast laser-induced cavitation bubble for precision cutting," Chiou said. "This process keeps cells alive as the nanoblade tool never enters the cell. So, we can achieve a very high efficiency in the delivery of large-sized, slow-diffusing cargo, such as mitochondria."

Additionally, Chiou and Teitell are engineering an approach that incorporates the nanoblade into a high-throughput system that could deliver desired cargo, such as mitochondria, into as many as 100,000 cells per minute.

Pei-Yu Chiou



The process of transferring mitochondria between cells using the nanoblade technology. Image credit: Alexander Patananan.

Jeff Eldredge: Develops 3-D model of a human airway, virtual leg to train combat medics

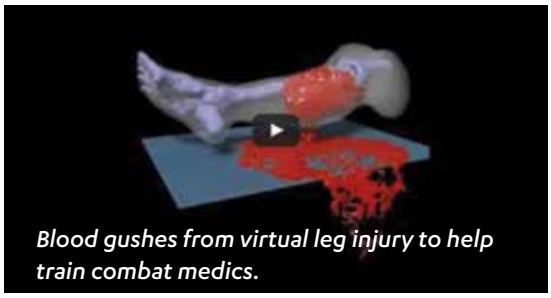
Jeff Eldredge

Imagine that before performing surgery, doctors could consult software that would determine the actual effectiveness of the procedure before even lifting a scalpel.

With the use of a computational model of the human airway being developed by MAE Professor Jeff Eldredge, people who suffer from sleep apnea may one day benefit from such a scenario.

Previously, Eldredge had been working on creating models that simulated the interactions between blood and vessel walls with Shao-Ching Huang, an expert in high performance computing from the UCLA Institute for Digital Research and Education (IDRE), which funded development of the computational tools for the project.

Additionally, in December 2015 at a conference in fluid dynamics, Eldredge and his UCLA colleagues presented the first detailed simulation of a human leg being injured by flying shrapnel, gushing blood and all. For that project, Eldredge worked in collaboration with a team from the Center for Advanced Surgical and Interventional Technology at the David Geffen School of Medicine. The goal is to train combat medics on a virtual patient that reacts in realistic ways. Researchers took CT scans of a patient's leg to create the simulated one.



Blood gushes from virtual leg injury to help train combat medics.

Rajit Gadh: Develops smart grid technology to tackle energy shortage

Rajit Gadh

MAE Professor Rajit Gadh is tackling energy shortage issues by redistributing energy from electric vehicles and solar panels based on consumer needs.

Gadh, the director of the UCLA Smart Grid Energy Research Center, is spearheading the development of a new energy distribution network, called smart grid technology. He intends to improve the technology in India through a new partnership between the Smart Grid Energy Research Center and an energy distribution company in New Delhi, UCLA officials announced Jan. 29.

The university and Tata Power Delhi Distribution Limited aim to use smart grid technology to increase the efficiency of energy delivery, lower its price and widen its coverage in India and other developing countries, he added.

Gadh is focused on applying smart grid technology to electric vehicles. His research team designed a new outlet for parking lots that allows up to four cars to be charged at once, compared to standard charging's one at a time. The researchers tested the technology on an experimental Mitsubishi in Parking Structure 9.

Gadh said smart grid technology, compared to traditional power grid technology, is a less centralized and more consumer-friendly network that distributes energy according to people's needs. He added he aims to increase charging capability by coordinating with car owners' schedules through a mobile application.

"This technology raises the efficiency of energy use and reduces the power price," Gadh said. "This is a win-win situation."

Gadh said he thinks electric vehicles are eco-friendly and powerful, but the standard method of charging them is inefficient.

Dan Goebel: Honored at UCLA Engineering Awards Dinner

MAE Adjunct Professor Dan Goebel was honored at the HSSEAS Awards Gala held on February 5, 2016, at the Beverly Hills Hotel.

Alumni Professional Achievement: Dan Goebel BS '77, MS '78, PhD '81 is a senior research scientist at the Jet Propulsion Laboratory whose work has led to the development of propulsion technologies used in the NASA Dawn mission to Mars and Jupiter, space stations and satellites. He is currently working on NASA's Asteroid Redirect and Retrieval Mission. Goebel, who is also an adjunct professor of electrical engineering at USC, has earned many honors, including membership in the National Academy of Engineering.

Dan Goebel

Chih-Ming Ho: New personalized medicine and tuberculosis treatments

MAE Professor Chih-Ming Ho was quoted in a recent article regarding new landmark research in personalized medicine:

"Optimizing the drug ratios during combination therapy for a population or a specific patient has, until now, been virtually impossible," said Ho, who is UCLA Engineering's Ben Rich–Lockheed Martin Professor, and a corresponding author of the study. "Our ability to calibrate how individual patients respond to treatment and to use that information to robustly guide their regimen based on the parabola-based approach has made personalized medicine a reality."

Additionally, researchers from UCLA and Shanghai Jiao Tong University have made an important step toward a substantially faster and more effective treatment for tuberculosis, which infects some 10 million people and causes 1.5 million deaths each year.

In the study, researchers used a technique called feedback system control, which was developed at UCLA, to study cells infected with the bacteria that cause tuberculosis. They quickly narrowed combinations of 14 different tuberculosis drugs with five different doses — resulting in 6 billion possibilities — into several promising combination treatments that kill the bacteria that cause tuberculosis much faster than the standard regimen used to treat tuberculosis.

"Designing a drug combination with optimized drug-dose ratios has, until now, been virtually impossible," said Ho, the study's principal investigator. "Feedback system control technology demonstrated it can pinpoint these best possible ratios for a wide spectrum of diseases."

Chih-Ming Ho

Dennis Hong: Technology that makes people happy, Hyupsung Social Contribution Award

Dennis Hong

They are all shapes and sizes, with all numbers of legs. They can put out fires on ships, shimmy up construction sites to do dangerous inspections, safely traverse battlefields and enter power plants to plug radiation leaks.

Oh, and they play soccer, too. One tiny one even break-dances.

These are just some of the products of the endlessly creative mind of UCLA's Dennis Hong, director of the legendary RoMeLa (Robotics and Mechanisms Laboratory), and his intrepid band of robot-loving graduate and undergraduate students.

"The more I study and research, the more I realize how far we are from the science-fiction robots — Rosie from 'The Jetsons,' C-3PO from 'Star Wars' and all the scary 'Terminator' robots," concludes Hong. "Only when it becomes a research program and finds its application does [a robot] idea become valuable. ... If you look at all our robots, it's technology that will help society and make people happy, give them independence and freedom. That's what we do."

Additionally, Prof. Hong was one of the 5 recipients of the prestigious 5th "2015 Hyupsung Social Contribution Award" at the award ceremony at the Hyupsung Foundation Bulding in Busan Korea, December 7. The Hyupsung Social Contribution Award is given for contributions to the society besides their great achievements in their respective fields. The winners will be given award plaques and awards of 50 million won each ($50,000 USD).

Professor Dennis Hong was chosen for his contribution in the development of life saving robots to be used at disaster sites, and technologies that can help the physically challenged including the world's first car for the visually impaired. He inspires the young generation especially in the science and engineering fields. He works for the beautiful coexistence of human and robots in the future.

Jonathan Hopkins: Wins Presidential Early Career Award for Scientists and Engineers

Jonathan Hopkins

MAE Assistant Professor Jonathan Hopkins received the Presidential Early Career Award for Scientists and Engineers (PECASE) from the White House. The award is the highest honor bestowed by the U.S. government on science and engineering researchers in the early stages of their careers.

"These early-career scientists are leading the way in our efforts to confront and understand challenges from climate change to our health and wellness," President Obama said in announcing the awards. "We congratulate these accomplished individuals and encourage them to continue to serve as an example of the incredible promise and ingenuity of the American people."

Jonathan Hopkins is leading research to generate the knowledge necessary to design and fabricate advanced flexible structures, mechanisms, and materials that enable the creation of new high-impact technologies. He leads the Flexible Research Group at UCLA which is exploring: microarchitectured materials; additive fabrication; microelectromechanical systems (MEMS); precision flexure systems; soft robots; and medical devices. Last year, his group received a $510,000 grant from the Air Force Office of Scientific Research (AFOSR) to help facilitate research involving the design and fabrication of microarchitectured materials with programmable properties.

Hopkins received his Ph.D. from the Massachusetts Institute of Technology. He was a post-doctoral researcher at Lawrence Livermore National Laboratory before joining UCLA in 2013.

Ann Karagozian: Interim Vice Chancellor for Research, quoted in LA Times

MAE Professor Ann R. Karagozian was appointed interim vice chancellor for research. A member of the UCLA faculty since 1982, she heads UCLA's Energy and Propulsion Research Laboratory and is the director of the Collaborative Center for Aerospace Sciences, a joint venture of the Air Force Research Laboratory and UCLA.

Professor Karagozian was quoted in the LA Times article "The final frontier: cheap space travel." The article is an overview of recent efforts in the new space race to cut launch costs. Professor Karagozian was quoted regarding using methane as fuel. From the LA Times:

Experts say liquefied natural gas, which is a commercially available form of methane, could have several advantages as a rocket fuel.

Blue Origin has said its wide availability and low cost would enable an "extended engine development test program."

Methane is also clean, meaning it's less likely to clog fuel lines inside the engine. **That would reduce the type of rigorous cleaning needed to clear those particulates and make it easier for reusability**, said Karagozian.

SpaceX is also developing a liquid-oxygen-and-methane staged combustion engine called Raptor, which company President Gwynne Shotwell has said could be flown on "orbital trajectories and beyond Earth missions," according to her statement last year to the House Armed Services Committee.

This could be a factor in the company's plans for Mars, as SpaceX has said methane could be synthesized in the Martian atmosphere. "**Methane has those advantages for reusability**," UCLA's Karagozian said. "**But it is not standard. It's not a sure thing by any means.**"

Ann Karagozian

Pirouz Kavehpour: Penguins' anti-ice trick revealed

BBC Earth

Penguin's Anti-Ice Trick Revealed

Bird feathers are known to have hydrophobic, or non-wetting, properties. But scientists from UCLA, University of Massachusetts Amherst and SeaWorld wanted to know what makes Antarctic penguins' feathers extra ice repelling. "What we learn here is how penguins combine oil and nano-structures on the feathers to produce this effect to perfection," explains UCLA mechanical and aerospace engineering professor Pirouz Kavehpour. The news was also carried in The Huffington Post; The Christian Science Monitor; Discovery News; the Daily Mail (U.K.); and the Daily Mirror (U.K.).

Pirouz Kavehpour

William Klug: Cutting-edge model of the heart will help scientists study new therapies

William Klug

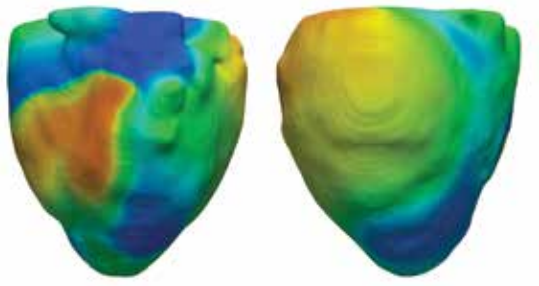
A team of UCLA doctors, scientists and engineers have created a detailed computer model that shows how the heart's electrical signals are affected by congestive heart failure. The "virtual heart" will help medical researchers study new drug therapies that could treat heart failure.

The model can simulate tiny, subtle changes in the heart's cells and tissues as well as the larger impact on the entire heart — the changes are then shown in a corresponding electrocardiogram, or ECG, a tool commonly used to diagnose heart abnormalities.

One of the senior authors of the paper was MAE Professor William Klug, who we tragically lost on June 1, 2016.

"Bill led the 'virtual heart' project," said study's principal investigator Alan Garfinkel, who holds faculty appointments in integrative biology and physiology in the UCLA College and in medicine at the David Geffen School of Medicine at UCLA. "His work will live on in this model, which can potentially help many who suffer from arrhythmias in congestive heart failure."

Congestive heart failure, commonly referred to as CHF, occurs when the heart cannot pump enough blood. It is a leading cause of death. Patients also die at an accelerated rate from electrical disturbances called arrhythmias, the subject of the UCLA study.



Xiaochun Li: Super-strong lightweight metal, also leads $140 million smart center

Xioachun Li

A team led by MAE Professor Xiaochun Li, holder of UCLA's Raytheon Chair in Manufacturing, has created a super-strong yet light structural metal with extremely high specific strength and modulus, or stiffness-to-weight ratio. The new metal is composed of magnesium infused with a dense and even dispersal of ceramic silicon carbide nanoparticles. It could be used to make lighter airplanes, spacecraft, and cars, helping to improve fuel efficiency, as well as in mobile electronics and biomedical devices.

To create the super-strong but lightweight metal, the team found a new way to disperse and stabilize nanoparticles in molten metals. They also developed a scalable manufacturing method that could pave the way for more high-performance lightweight metals. The research was published today in Nature.

Additionally, President Barack Obama has announced a $70 million federal award to a nonprofit co-founded by UCLA to create a nationwide Smart Manufacturing Innovation Institute, with the goal of improving the efficiency of advanced manufacturing. Li is the technical director for the institute's California Regional Center.

The institute will be headquartered in downtown Los Angeles in partnership with the city, led by the Smart Manufacturing Leadership Coalition. It will include a national network of five regional manufacturing centers funded by $70 million from the U.S. Department of Energy and more than $70 million in matching funds from many of the institute partners. President Obama announced the new institute June 20, 2016.

Webb Marner: Receives honorary membership from ASME

MAE Adjunct Professor Webb Marner was the recipient of Honorary Membership from the American Society of Mechanical Engineers (ASME) on November 16, 2015 at the 2015 International Mechanical Engineering Conference Exhibition in Houston, Texas. Honorary Membership is the highest award bestowed by ASME.

He was honored for "significant contributions to the mechanical engineering profession through research in enhanced heat transfer, gas-side fouling, and process engineering; outstanding teaching and student mentoring; and extensive, exemplary professional service."

After graduating from Purdue University he spent nearly two years as a quality control engineer with Sarkes Tarzian, Inc., Bloomington, Indiana, a TV tuner manufacturing company. After an MSME degree from Purdue and a PhD degree from the University of South Carolina, he served on the faculty of the South Dakota School of Mines for four years, spent seven years carrying out research at Heat Transfer Research, Inc., and then spent most of his career (26 years plus seven years as an interim employee) at Caltech's Jet Propulsion Laboratory (JPL). Dr. Marner's early years at JPL were devoted to energy related research and development. From 1995-2004 he served as Manager of the Measurement, Test, and Engineering Support Section in the Mechanical Systems and Research Division. During this period his highly diverse section had a workforce of up to 200 employees and annual budgets up to $ 34 M. The primary responsibility of the Section was to support the testing of the Laboratory's projects – including Cassini, Mars Pathfinder, and Mars Exploration Rover (MER) — in the Environmental Test Laboratory (ETL). He also taught part-time at Cal State LA, CSUN, and has been at UCLA since 1991 where he teaches courses in the thermal sciences.

Webb Marner

Laurent Pilon: Researchers receive $1.2 Million to develop more energy-efficient windows

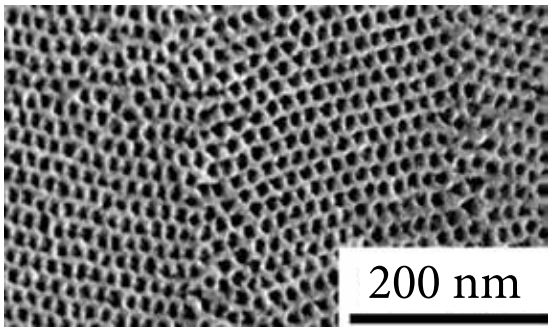
UCLA Engineering researchers have received $1.2 million from the Department of Energy to improve the efficiency of existing single-pane windows in commercial and residential buildings. The federal agency's goal is to accelerate the development of materials that could cut in half the amount of heat lost through single-pane windows.

The UCLA team is developing a transparent coating that can reduce the transfer of heat from one side of the window to the other, and better resist condensation that leads to mold and other forms of building damage. The project is called Thermally Insulating Transparent Barrier (THINNER) Coatings for Single-Pane Windows.

MAE Professor Laurent Pilon is the lead researcher on the project. Others include Professor Bruce Dunn, the Nippon Sheet Glass Company Chair in Materials Science; MAE Assistant Professor Yongjie Hu, and Sarah Tolbert, a professor of chemistry and biochemistry who holds a joint appointment in materials science and engineering.

"Our team is combining expertise in nanomaterials, optics, and thermal sciences to create a new transparent and insulating multilayer nanoporous titania/silica coating for windowpanes," Pilon said. "In order to ensure that the process is scalable, we are also developing a high temperature spray-on application process that is compatible with the operations of conventional glass manufacturers."

Laurent Pilon



Scanning electron microscope image of the UCLA nanoporous titania/silica coating material that can improve the energy-efficiency of windows.

Jacob Rosen: Surgical robotic system "RAVEN" featured on NBC medical drama "Heartbeat"

Jacob Rosen

MAE Professor Jacob Rosen's RAVEN surgical robotic system was featured on the NBC medical drama "Heartbeat" during the episode "The Land of Normal" which aired April 20, 2016.

Prof. Rosen was contacted by researchers from NBC. Commercially available robotic systems which are heavily regulated by the FDA are prevented from featuring a new and futuristic approach to surgical robotics. However it is the core and true nature of research platforms to explore the boundaries of the impossible. As such Raven was selected to be featured on NBC Heartbeat.

"The scriptwriter, director, and physician and nurse medical advisors met with me in lab to learn more about RAVEN and its capabilities," said Rosen. "They changed the original script to include the system in this episode reflecting its true futuristic nature."

Heartbeat, a tense medical drama about a heart surgeon who struggles to balance her personal and professional life, is a show "that is simultaneously realistic and futuristic," Rosen observed. The episode needed a research platform that could be both, and RAVEN was it in light of the RAVEN appearance in 2013 movie "Ender's Game."

Jason Speyer: Recipient of the 2016 Richard E. Bellman Control Heritage Award

Jason Speyer

The American Automatic Control Council has selected MAE Professor Jason Speyer as the recipient of the 2016 Richard E. Bellman Control Heritage Award. The Bellman Award is given for distinguished career contributions to the theory or application of automatic control. It is the highest recognition of professional achievement for US control systems engineers and scientists. Prof. Speyer's award citation will read:

For pioneering contributions to deterministic and stochastic optimal control theory and their applications to aerospace engineering, including spacecraft, aircraft, and turbulent flows.

The award was presented at the 2016 American Control Conference during the Awards Ceremony on Thursday, July 7, 2016, at the Boston Marriott Copley Place in Boston, MA.

Tsu-Chin Tsao, Veronica Santos, Xiaochun Li: Making a home from materials on Mars

Tsu-Chin Taso

Buoyed by their success in the first stage of a recent NASA challenge, a team of UCLA engineers and architects aims to design and build a demonstration habitat for humans on Mars. Their prototype, to be entered in the challenge's next stage, would be built with high-performance composite materials comprised only of materials native to the Red Planet.

Earlier this year, the UCLA Hybrid Composites team's proposal earned a runner-up spot (fourth out of 165 entries) in the first stage of NASA's 3-D Printed Habitat Challenge, part of the space agency's Centennial Challenges program designed to "advance construction technologies needed to create sustainable housing solutions for Earth and beyond."

"The UCLA team's engineering experts in materials, 3D printing, robotics, and control are creating innovative processes and equipment for the MARS habitat challenge," said Tsu-Chin Tsao, professor and chair of the UCLA Mechanical and Aerospace Engineering Department.

The UCLA Hybrid Composites team members include: Özel; Tsao; Les Lackman, deputy director of UCLA Engineering's Institute for Technology Advancement (ITA) and an adjunct professor; MAE Associate Professor Veronica Santos; MAE Professor Xiaochun Li; Wei Kao, technology strategist at ITA; Larry Carlson, ITA's director of advanced materials; Jenn-Ming Yang, professor of materials science and engineering and UCLA Engineering's associate dean for international initiatives and online programs; and Matt Gerber, a mechanical engineering Ph.D. student.

Veronica Santos

Richard Wirz: UCLA Grand Challenge reveals plan for environmental sustainability

MAE Associate Professor Richard Wirz was recently quoted in the Daily Bruin article "UCLA Grand Challenge reveals plan for environmental sustainability".

Wirz researches cost-effective sources of renewable energy for the Challenge. One statistic the plan cited to support the cause for environmental policy change in L.A. states that renewable energy, like wind and solar power, powers only 22 percent of L.A. County's electricity.

"In LA, (energy consumption) is a gigawatt problem, so we need gigawatt solutions," said Wirz, a member of the Challenge's main steering committee.

Wirz leads a team that aims to improve wind turbine technology and solar thermal energy storage. His project, funded in part by the California Energy Commission, plans to test the technology at a solar field in Brawley, California in 2016, he said.

"It's a volunteer effort – myself and others do it out of a labor of love," Wirz added. "It's not helping our salary. Everyone on a committee is passionate about saving the planet."

Wirz said he thinks the initiative has the potential to impact cities, states and countries beyond the immediate UCLA area, potentially making L.A. a model for urban sustainability and livable ecosystems.

"This is an effort to be responsible," he said. "We're trying to create an example for other parts of the world."

Richard Wirz

MAE students Caguimbal, Wu are 2016 UCLA Engineering Award winners at commencement

2016 Student Speaker Gregory Caguimbal, B.S. ME

2016 Outstanding Bachelor of Science Award Michael J. Wu, B.S. ME

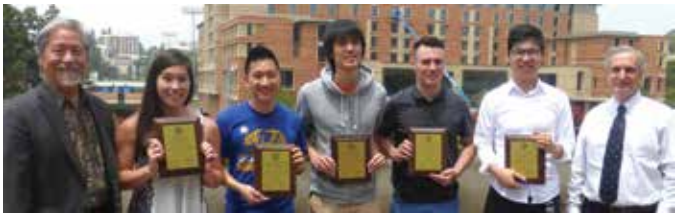
Each year the seven departments of the UCLA Henry Samueli School of Engineering and Applied Science, and the school as a whole, bestow honors on top graduates and those students who made special contributions during their collegiate careers.

Two MAE students were selected this year and have plans now that they've graduated.

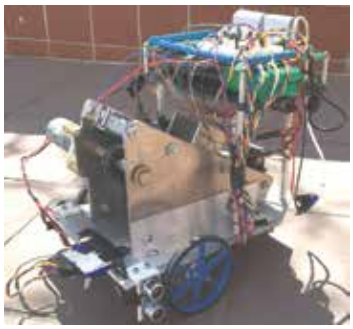
Gregory Caguimbal, BS ME, started in August at Lockheed Martin in Sunnyvale.

Michael J. Wu, BS ME, will attend UC Berkeley to pursue a master of engineering in mechanical engineering, with a concentration in product design.

The 6th Annual Mechanical Engineering Capstone Design Course MAE162D/E Competition



First Prize Winners – Team 13 from left to right Joe Zhou, Cheney Mao, Joey Nicolino, Clara Takahashi, Michael Wu, Cheney Mao, Joey Nicolino, Joe Zhou – the team is flanked by (left) Jason Hatakeyama (Boeing) and Prof. Robert Shaefer (right).



First Prize Winner Team-13 Autonomous Transporter.

ME senior Adam Garcia and other students team up with Chancellor Block to create an app

Adam Garcia, Will Gu, Chancellor Gene Block and Tanuj Lalwani. Image by Reed Hutchinson/UCLA.

Adam Garcia is one of three UCLA students who are going to try and turn the chancellor's idea for a phone app to improve productivity by tracking participants' input at meetings — or even class seminars — into reality.

The challenge is part of the 3rd Annual Code for the Mission, which is asking students to use their skills to create an app that uses voice and speech recognition to analyze and improve the dynamics of group interactions.

MAE graduate student Gary Li wins 1st place at 2016 UCLA Grad Slam, wins 3rd place at UC Grad Slam

Aerospace engineering graduate student Gary Li won first place March 3, 2016, at UCLA Grad Slam, a campus-wide competition where graduate students give three-minute presentations on their research. Li went on to win third place on April 22, 2016, at the UC Grad Slam, which took place in San Francisco.

Li, who bested nearly 70 students over three rounds of competition at UCLA, received a $3,000 stipend for first place.

His presentation, "Traveling to Mars with Immortal Plasma Rockets," described how traditional chemical rockets currently used for space propulsion could be replaced with much more efficient plasma thrusters.

MAE alumnus and Northrop Grumman employee David E. Lee receives an Asian-American Engineer of the Year Award

Northrop Grumman Corporation (NYSE:NOC) employee David E. Lee, received an Asian-American Engineer of the Year of the Award at the 15th annual Asian-American Engineer of the Year (AAEOY) award ceremony, held this weekend in New Brunswick, New Jersey. The AAEOY Awards recognize outstanding Asian-American professionals for their leadership, technical achievements and public service in the fields of science, technology, engineering and mathematics (STEM).

Since 2002, hundreds of Asian-American professionals from U.S. technology corporations, research institutions and the U.S. Armed Forces have been honored with AAEOY awards. The past awardees included Nobel Laureates, academicians, corporate executives and astronauts.

Lee earned a bachelor's degree in mathematics, a master's degree in manufacturing engineering and a doctorate degree in mechanical engineering from UCLA.

Jon Van Lew wins Best Student Award at ISFNT

Jon Van Lew (second from right), a UCLA graduate student, split top prize of the inaugural FED Student Award @ISFNT.

Jon Van Lew, a Ph.D. candidate of Mechanical Engineering at the UCLA Henry Samueli School of Engineering and Applied Science, was awarded the Fusion Engineering and Design Student Award for Outstanding Presentations for his contribution to the 12th International Symposium on Fusion Nuclear Technology (ISFNT-12), held on Jeju Island, South Korea. Sponsored by Elsevier, the award acknowledges outstanding contributions to the field of Fusion Nuclear Technology, presented at the conference

His presentation was titled *Numerical Study on Influences of Bed Resettling, Breeding Zone Orientation, and Purge Gas on Temperatures in Solid Breeders*. Top honors of the award and prize money were shared between Jon Van Lew and Cristian Gleason-Gonzalez, a researcher from the Karlsruhe Institute of Technology.

MAE researcher Giacomo Po wins new NSF research grant to study the ductility of transition-metal carbides through experiments and modeling

MAE researcher Dr. Giacomo Po won a new research grant from the National Science Foundation to study the ductility of transition-metal carbides through experiments and modeling. These materials exhibit high hardness, high stiffness, good resistance to wear, ablation, and corrosion, high-temperature mechanical strength along with good electrical conductivity, but they are brittle. The new study at UCLA will reveal the fundamental origin of their brittleness, and how to design such materials to be ductile at the nano and microscales. Exploring the relationship between dislocation activity and onset of fracture may potentially lead to the design of tougher miniature structural components, such as micro- and nano-electromechanical systems (MEMS and NEMS). Po's proposed research will provide the much needed theoretical insights into the role of structural defects on plasticity in these hard materials. Po is in the process of securing a tenure-track faculty position and can be reached at gpo@ucla.edu.

AE grad student Salvador Badillo-Rios earns NDSEG Fellowship

AE graduate student Salvador Badillo-Rios received a National Defense Science and Engineering Graduate (NDSEG) Fellowship, one of the country's top honors for students in the early part of their graduate study. The fellowships are awarded to students in 15 areas of Department of Defense interest.

Badillo-Rios is among four UCLA students and 180 nationwide to receive the fellowship. The fellowship pays for each student's full tuition and academic fees for three years. Students also receive a stipend. The awards were announced by the American Society for Engineering and Education, which administers the fellowship program.

Wen Yu Peng '14 named 2016 NSF Graduate Research Fellow

Four UCLA Engineering students and five alumni now at other institutions have received the prestigious Graduate Research Fellowship from the National Science Foundation for 2016. The recipients include current graduate students Calvin Brown, N.H. Diane Kim, and Angus Sidore, senior Kyrollos Yanny, and alumni Anjali Mulchandani, Trenton Otto, Wen Yu Peng, Stephanie Wang and Albert Yen. The fellowship program, which offers three years of financial support, recognizes "outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based master's and doctoral degrees at accredited United States institutions."

Wen Yu Peng '14
Field: Aerospace Engineering
Current institution: Stanford University
Undergrad advisor: Ann Karagozian

MAE Graduate Council (MAEGC) formed to help grads

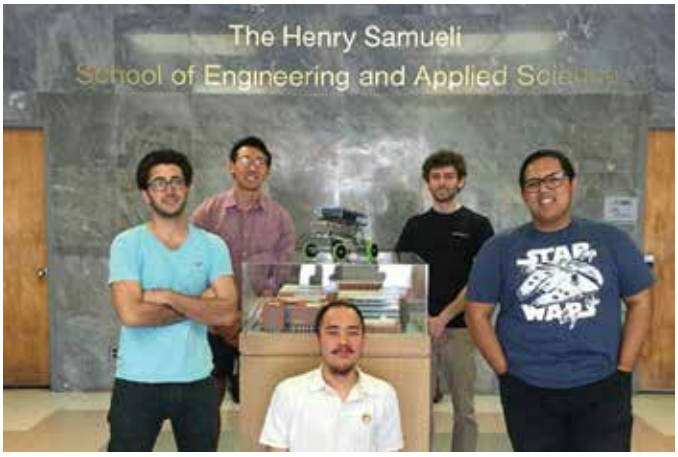
UCLA MAE is proud to announce the formation of the Mechanical and Aerospace Engineering Graduate Council (MAEGC). This graduate student-founded body is a registered campus organization that aims to promote social activities and provide a forum for grads to voice their opinions within the MAE department. The founding members of MAEGC are excited to plan departmental mixers, company visits, and maintain a lounge and message board for MAE grads. MAEGC's inaugural social took place during May 2016 and drew nearly one hundred attendees. For more information about upcoming events or how to get involved, please contact mae_gc@seas.ucla.edu or visit us on Facebook at www.facebook.com/MAEGradCouncil.

MAE alumnus Hanchen Huang elected as a Fellow of the Society of Engineering Science

MAE alumnus Hanchen Huang was elected as a Fellow of the Society of Engineering Science for his outstanding achievements in materials and mechanics, and leadership in the engineering community.

Professor Huang joined Northeastern in 2013, as Chair of the Mechanical and Industrial Engineering Department. He is also an elected Fellow of the American Society of Mechanical Engineers and an elected Member of the Connecticut Academy of Science and Engineering. Professor Huang received his Ph.D. from UCLA in 1995.

MAE-162E Capstone Design class team wins 1st place in the Science, Engineering and Math category for the 2016 Library Prize for Undergraduate Research



A MAE-162E Capstone Design class team won first place in the Science, Engineering, & Math category for the 2016 Library Prize for Undergraduate Research.

Gregory Caguimbal, Thomas Chun, Hunter Jones, Fadi Rafeedi, and Samuel's project "Rack Attack" impressed the judging panel, who remarked on the outstanding teamwork, research, and writing skills demonstrated by the students.

John Domann: Magnetic Material Signals Car Crashes

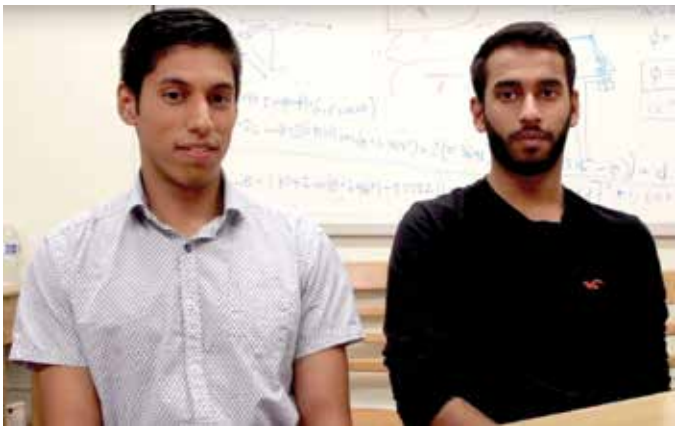
From The Naked Scientists (podcast)

John Domann, a mechanical engineering graduate student advised by Professor Greg P. Carman, was interviewed by the Cambridge University-based podcast The Naked Scientists, on recent published results on galfenol, a magneto-elastic material. One application could help computers in cars react to a collision and protect passengers, as the material's signal travels at the speed of light.

Domann was also quoted in Phys.org regarding Galfenol (edited):

"In general this means a magnetoelastic material can convert mechanical energy into magnetic energy, and vice versa," explained Domann. Galfenol converts energy with high efficiency; it is able to turn roughly 70 percent of an applied mechanical energy into magnetic energy, and vice versa. Significantly, the magnetoelastic effect can be used to generate electricity. "If we wrap some wires around the material, we can generate an electrical current in the wire due to a change in magnetization," Domann said.

MAE students Anthony Gildemeister, Reuben Rozario help create NASA satellite



Anthony Gildemeister and Reuben Rozario.

ELFIN is a group of students building a satellite on the UCLA campus. They are working in conjunction with NASA to launch in 2017, with the goal of measuring electron losses in space. Second year aerospace student Reuben Rozario and third year mechanical engineering student Anthony Gildemeister are helping to create the NASA satellite.

Brian Shedd, ME PhD: Entrepreneurship resources grow for UCLA undergraduate students

Brian Shedd changed out of a T-shirt and jeans into business casual clothes to sneak into entrepreneurship events when he was an engineering graduate student in 2006. At the time, Shedd was interested in entrepreneurship, but couldn't find the resources to learn more about it.

"I got on (the Entrepreneurship Association's) mailing list, found out about events and hung out until people realized I wasn't supposed to be there," he said. "Engineering students stand out in a room full of business students."

Years later, the entrepreneurship environment for UCLA students has changed dramatically, providing several resources and entrepreneurial student groups for undergraduate students and non-business students.

Shedd, who now works in the Office of Intellectual Property and Industry Sponsored Research, or OIP, said there was an explosion of entrepreneurial student groups and activity once StartUp UCLA, which provides consulting resources and space for startups, was founded in 2012.

Phillipe Videau: UCLA Engineering Student Helps Create New Bike Helmet Technology

Philippe Videau held a single flexible strip of connected triangular pieces in his hands. Seconds ago, the product was an entire bike helmet with an organic frame made of mycelium, a structure found in mushrooms.

Videau, a fifth-year aerospace engineering student, said he and fellow project members wanted to create a lighter, less bulky bike helmet after discovering biking was a common interest.

The bike helmet's framework is made of mycelium – fiber found in mushrooms and other fungi that can mold to customized head shapes. Mycelium is a natural, biodegradable material unlike polystyrene, a compound found in everyday helmets.

"We thought as long as we're making the helmet foldable, lighter and custom-fit, why not explore the sustainable and biodegradable aspect?" Videau said.

William Klug, 39, UCLA MAE engineering professor whose research crossed disciplines

William S. Klug, a professor of mechanical and aerospace engineering, died June 1, 2016. He was 39.

The university has established a fund to enable the community to contribute to help support his family.

The Department of Mechanical and Aerospace Engineering has established a virtual wall where well-wishers can leave a note or a remembrance for Profesor Klug's family.

Klug, a beloved and committed scholar, conducted life-saving research that also involved colleagues from UCLA's engineering, science and medical faculty. He specialized in computational biomechanics and the mechanics of biological systems, such as cancer cells.

Klug had been a member of the UCLA community since his days as a graduate student, from 1998 through 1999, when he earned a master's degree in civil engineering. He went on to earn a doctorate from Caltech in 2003, and then returned to UCLA that year as a faculty member of the Henry Samueli School of Engineering and Applied Science. Klug held appointments in mechanical and aerospace engineering and in bioengineering, and he was promoted to full professor in 2015.

"Our entire UCLA family is mourning the loss of Professor Klug, a respected, dedicated and caring faculty member," UCLA Chancellor Gene Block wrote in a statement to the campus community. "At this time, our thoughts and prayers are with Professor Klug's wife, Mary Elise, his two children, and his extended family, friends and colleagues. ... Let us remember and be grateful for the wonderful gifts and talents Professor Klug shared with us at UCLA."

Among his recent research projects, Klug was collaborating with colleagues at the David Geffen School of Medicine in running the UCLA Cardiac Modeling Group. Funded by a $4.3 million grant from the National Institutes of Health, the researchers were applying biomechanics to cardiology research with the goal of better understanding the electromechanics of the heart.

His previous research provided a clearer picture of the physics of cells and their organelles, which had applications for understanding the life cycles of viruses like HIV. He was also director of the Klug Research Group, which studied computational biomechanics, including how biological structures' shape and mechanics affects their function.

MAE Chair and Professor Tsu-Chin Tsao said "We lost a professor who cared a lot about his students and who was on a very positive trajectory. My heart goes out to his family."

Klug received a number of prestigious awards, including a 2008 National Science Foundation Career Award of $475,000 over five years and his department's Samueli Teaching Award in 2007. In his career, he used that and other grants to support research by a number of doctoral and post-doctoral scholars whom he worked with or mentored. In 2012, he was honored by Westmont College, his undergraduate alma mater, as a distinguished alumni.

National Academy of Engineering Members

Albert Carnesale

Election Year: 2011.

Election Citation:

"For bringing engineering excellence and objectivity to international security and arms control, and for leadership in higher education."

Vijay Dhir

Election Year: 2006.

Election Citation:

"For work on boiling heat transfer and nuclear reactor thermal-hydraulics and safety."

Dan Goebel

Election Year: 2015.

Election Citation:

"For contributions to low-temperature plasma sources for thin-film manufacturing, plasma materials interactions, and electric propulsion."

Chih-Ming Ho

Election Year: 1997.

Election Citation:

"For contributions to the understanding and control of turbulent flows."

John Kim

Election Year: 2009.

Election Citation:

"For development of direct numerical simulation and seminal contributions to the understanding of the physics and control of turbulent flows."

Kuo-Nan Liou

Election Year: 1999.

Election Citation:

"For contributions in the theories of radiation transfer and light scattering, with applications to remote sensing technology and climate modeling."

Ali Mosleh

Election Year: 2010.

Election Citation:

"For contributions to the development of Bayesian methods and computational tools in probabilistic risk assessment and reliability engineering."

Lucien A. Schmit, Jr.

Election Year: 1985.

Election Citation:

"For pioneering work in structural synthesis, combining finite element analysis and nonlinear programming algorithms to create a powerful class of modern structural design methods."

Jason L. Speyer

Election Year: 2005.

Election Citation:

"For the development and application of advanced techniques for optimal navigation and control of a wide range of aerospace vehicles."

Design, Robotics, and Manufacturing


Rajit Gadh


Dennis Hong


Jonathan Hopkins


Xiaochun Li


Jacob Rosen


Veronica Santos

ALSO

Abdou
Carman
Ghoniem
Tsao

Fluid Mechanics


Jeff Eldredge


Ann Karagozian


Pirouz Kavehpour


John Kim


Mitchell Spearrin


Richard Wirz


Xiaolin Zhong

Heat and Mass Transfer


Mohamed Abdou


Vijay Dhir


Yongjie Hu


Adrienne Lavine


Jayathi Murthy


Laurent Pilon

ALSO

Ju
Kavehpour
Spearrin

MEMS and Nanotechnology

Yong Chen

Pei-Yu Chiou

Vijay Gupta

Chih-Ming Ho

Sungtaek Ju

Chang-Jin Kim

ALSO

Carman
Hu
Kavehpour
Li
Pilon

Structural and Solid Mechanics

Oddvar Bendiksen

Greg Carman

Nasr Ghoniem

William Klug

Christopher Lynch

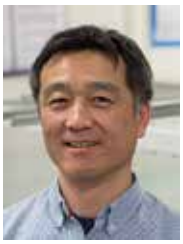
Ajit Mal

ALSO

Gupta
Hopkins
Li

Systems and Control

Steven Gibson



Tetsuya Iwasaki

Robert M'Closkey

Jason Speyer

Tsu-Chin Tsao

ALSO

Hopkins
Santos

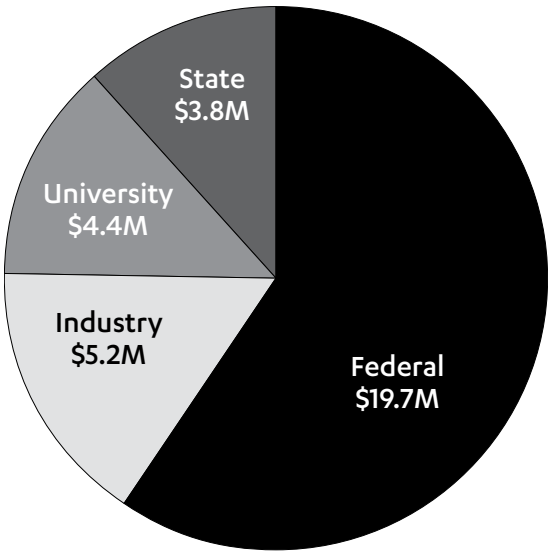
Faculty and Staff

Ladder Faculty	36
Joint Appointments	2
Emeriti Faculty	10
Adjunct	6
Lecturers	30
Staff	24

Recognitions

NAE Members	9
Society Fellows	60
CAREER Awards	13
Young Investigators	6

Research Budget (in millions)



Total $33.1M

Research Centers

The Mechanical and Aerospace Engineering Department contributes to the following Research Centers:

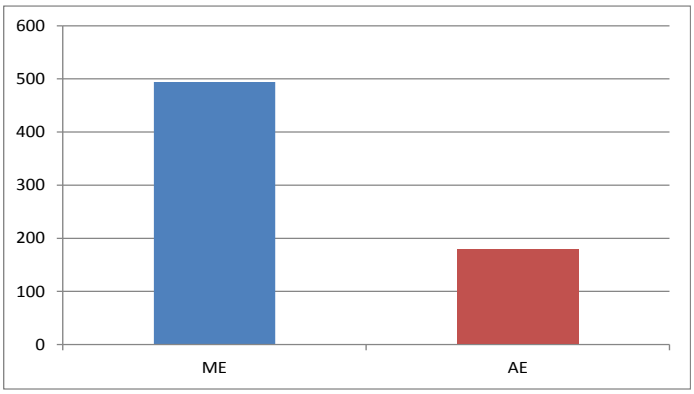
CCAS - UCLA-AFRL Collaborative Center for Aerospace Sciences (Karagozian)

FSTC - Fusion Science and Technology Center (Abdou)

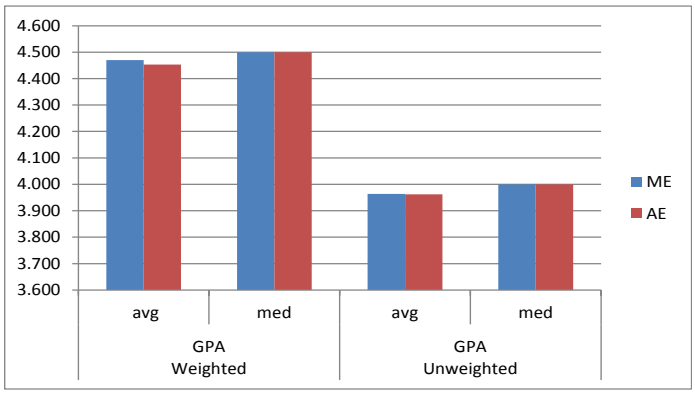
SMERC - Smart Grid Energy Research Center (Gadh)

TANMS - Center for Translational Applications of Nanoscale Multiferroic Systems (Carman)

2015 Fall Quarter Undergraduate Enrollment

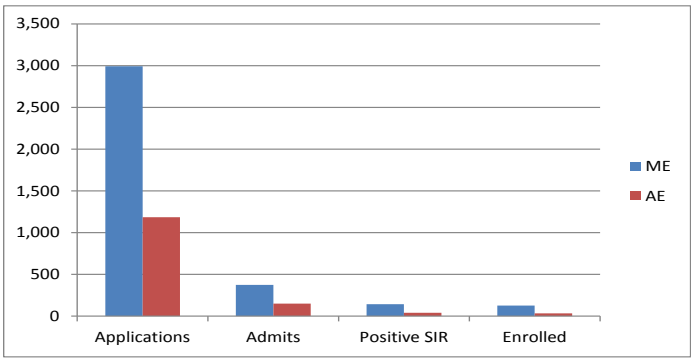


2015 Fall Quarter Enrolled Freshman GPA

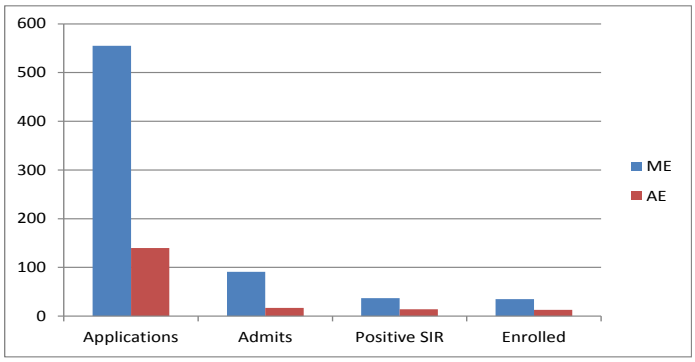


2015-16 Undergraduate Admission Statistics

Freshman



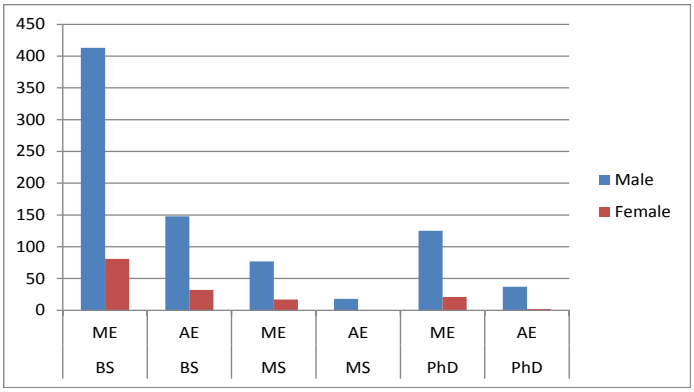
Transfer



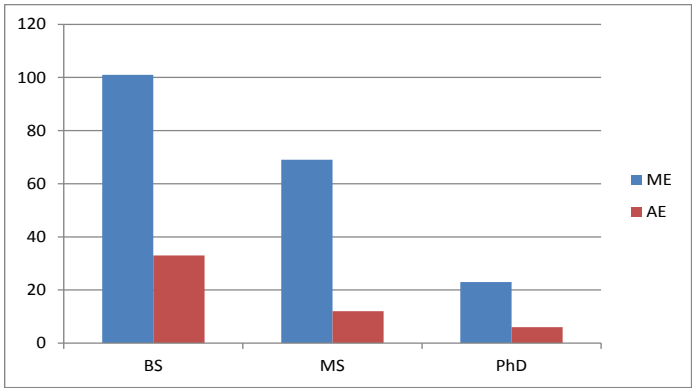
2015-2016 Graduate Admissions Statistics

	Applicants			Admits			Enrolled		
	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign	Total
ME	206	519	725	140	137	277	53	54	107
AE	83	65	148	48	18	66	22	5	27
Total	289	584	873	188	155	343	75	59	134
% Foreign		66.90%			45.19%			44.03%	

Gender Breakdown by Major



2015-16 Degrees Granted



Industrial Advisory Board

MAE Industrial Advisory Board Meeting February 19, 2016. Left to right: Steven J. Yahata, Boeing Company; Tetsuya Iwasaki, MAE Professor; Geoffrey McKnight, HRL Laboratories; Erick Hall, Aerospace Corporation (front); Luke Haylock (IAB Chair), Alcoa (back); Ajit Mal, MAE Professor; Chris Lynch, MAE Professor and IAB liaison; Wayne Goodman, Aerospace Corporation; Michael T. Huggins, AFRL; Timothy Frei, Northrup-Grumman; Ingo Foldvari, National Instruments; Tsu-Chin Tsao, MAE Chair and Professor.

Aerospace Corporation
Dr. Erick Hall
General Manager, Vehicle Systems Division

Air Force Research Laboratory
Michael T. Huggins
Chief/Site Director, Rocket Propulsion Division

Alcoa
Luke Haylock (IAB Chair)
Director of New Product Development

Boeing Company
Eugene Lavretsky
Senior Technical Fellow

Boeing Company
Steven J. Yahata
Director, Structures Technology,
Boeing Research & Technology

Honeywell Engines, Systems & Services
Matt Schacht
Acting Director Environmental Control Systems Engineering

HRL Laboratories, LLC
Geoffrey McKnight
Scientist, Sensors and Materials Laboratory

Intel Assembly Technology Development
Gaurang Choksi
Manager, Core Competency Development

JPL NASA
Tom Cwik
Manager of the NASA Space Technology Program
JPL Astronomy, Physics, and Space Technology Directorate

Lockheed-Martin Aeronautics Company
Philip A. Conners
Engineering Director – Palmdale Site

NASA Armstrong Flight Research Center
David McBride
Center Director

National Instruments
Ingo Foldvari
University Program Manager, US West

Northrop-Grumman Aerospace Systems
Timothy J. Frei
Vice President, System Enhancements and Product Applications

RAND Corporation
Natalie W. Crawford
Senior Fellow and former Director, Project AIR FORCE

Raytheon Space and Airborne Systems
Patrick J. Fitzgerald
Department Manager, Thermal & Structural Design Dept.
Mechanical & Optical Engineering Center

Alumni Advisory Board

MAE Alumni Advisory Board. Left to right: Sharat Batra '05, Sean Oh (ASME), Gerard Toribio '08, Anny Lin (AIAA), Nirav Mehta (SAE), Jessica Leung '15, Norris Tie '14, Prof. Ajit Mal, David Lee MS '90, PhD '98, Hannah Jorgensen '10, Anthony Tyson '12, Prof T-C Tsao, James Sharp '03, MS '06, William Goodin MS '71, PhD '75 (Chair).

Sharat Batra, '05, ME, LA DWP
Eddie Chau, '89, ME, CCI Valve
Mark Ford, '82, MS '88, AE, Northrop Grumman
Anthony Gambardella, '12, MS '13, ME, SpaceX
Greg Glenn, '03, MS '06, ME, Freedom innovations
Aditi Gobburu, '07, MS '08, ME, Northrop Grumman
William Goodin, 'MS '71, PhD '75, ME, UCLA
Bill Holbrow, '90, ME, Blakely Sokoloff LLP
Sean Hutchinson, '12, AE, Zodiac
Hannah Jorgensen, '10, AE, Northrop Grumman
David E. Lee, 'MS '90, PhD '98, ME, Northrop Grumman
Sasha Lukyanets, '07, MS '09, AE, The Aerospace Corporation
Mark Malicdem, '05, AE, B/E Aerospace
Eugene Nemirovsky, '05, ME, Scaled Composites
Avi Okon, '02, MS '05, ME, JPL
Yesha Shah, '14, AE, Orbital ATK
James Sharp, '03, MS '06, ME, Northrop Grumman
Brian Shedd, 'MS '05, PhD '08, ME, UCLA
Eliza Sheppard, 'MS '05, MBA '10, ME, Northrop Grumman
Marianne So, '07, ME, Honeywell
Norris Tie, '14, AE, Northrop Grumman
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