UC San Diego
JACOBS SCHOOL OF ENGINEERING

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Celebrate what you value

As an engineering dean, I'm laser-focused on helping people to develop technologies that will have positive impacts on the lives of large numbers of people. This is what I aim for every day here at the UC San Diego Jacobs School of Engineering. But it's not enough to encourage positive impact. I feel it's necessary to recognize and celebrate these positive impacts, both here at the Jacobs School and around the world.

At this very moment, I am engaged in UC San Diego's longstanding efforts to celebrate positive impact through the Kyoto Prize Symposium. This year's Kyoto Prize Laureate in Advanced Technology is Caltech Professor Emeritus Carver Mead; and our own Jacobs School electrical engineering and computer science professor Andrew Kahng is leading campus efforts to make Carver Mead feel welcome within our community. Carver Mead not only helped to invent the VLSI process, a fundamental of all modern microelectronics, but he has had an entire career of impactful success after impactful success. There are local events here in San Diego, as well as events in Kyoto, Japan. I'm hoping you'll come and help me celebrate.

Because I believe we should celebrate what we value around the world, I have invested my personal time in helping launch another international prize. Just in its third year, this set of prizes, totalling $4.5M annually, is focused on positive impact on people and the planet. I'm talking about the VinFuture Prize, and I serve as co-chair of the pre-screening committee. I am proud to let you know that the grand-prize-winning projects in the first two years of the award have been mRNA vaccines and then global networking technology. Talk about your global positive impact!

In addition to the $3M grand prize, there are three VinFuture special prizes at $500K each. These special prizes celebrate projects with great potential for widespread positive impacts within 10 years. They also bring particular attention to the contributions of women, people working in developing countries, and people working in emerging fields. You can read about the 2022 winners and 2021 winners. For 2023, nominations are now open. I hope I've inspired you to nominate people for VinFuture prizes. Or to encourage others to nominate for this or other prizes focused on positive impact.

As always, I can be reached at DeanPsano@eng.ucsd.edu.

Sincerely,
Al
Albert ("Al") P. Pisano, Dean
UC San Diego Jacobs School of Engineering

UV Nail Polish Dryers Damage DNA

Nail polish dryers that emit ultraviolet (UV) light damage DNA and cause mutations in human cells, according to research led by UC San Diego bioengineers. The findings suggest that the ultraviolet nail polish drying devices used to cure gel manicures may pose more of a public health concern than previously thought. "If you look at the way these devices are presented, they are marketed as safe, with nothing to be concerned about," said Ludmil Alexandrov, a professor of bioengineering as well as cellular and molecular medicine at UC San Diego, and corresponding author of the study published in *Nature Communications*. "But to the best of our knowledge, no one has actually studied these devices and how they affect human cells at the molecular and cellular levels until now." Read coverage in NPR, The Washington Post, and watch first author UC San Diego bioengineering postdoc Maria Zhivagui on CBS News.

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Wearable Sensor Tracks Heart Pumping During Exercise

A new wearable heart monitor uses ultrasound to provide automated insights on both the structure and function of the human heart. This "wearable echocardiogram" works during strenuous exercise; can be worn for up to 24 hours; and is the size of a postage stamp. Thanks to custom AI algorithms, the new device is capable of measuring how much blood the heart is pumping. This is important because dysfunctions in heart pumping are at the root of most cardiovascular diseases. But testing heart pumping issues often manifest only when the body is in motion. The work, led by nanoengineering professor Sheng Xu, was published in *Nature*. Read coverage in IEEE Spectrum, The San Diego Union Tribune, and New Scientist.

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Injectable Biomaterial Treats Damaged Hearts

A new biomaterial that can be injected intravenously reduces inflammation in tissue and promotes cell and tissue repair. "This biomaterial allows for treating damaged tissue from the inside out. It's a new approach to regenerative engineering," said UC San Diego bioengineering professor Karen Christman, the lead researcher on the team publishing in *Nature Biomedical Engineering*. The biomaterial was tested and proven effective in treating tissue damage caused by heart attacks in both rodent and large animal models. The biomaterial could be beneficial to patients with traumatic brain injury and pulmonary arterial hypertension as well. Christman and Ventrix Bio, Inc., a startup she cofounded, are planning to ask for authorization from the FDA to conduct a study in humans of the new biomaterial's applications for heart conditions. Watch a video explainer from The Sheeley Science Show.

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Farinaz Koushanfar named ACM Fellow

UC San Diego electrical engineering professor Farinaz Koushanfar has been named one of 57 Fellows of the Association for Computing Machinery (ACM) for 2022. Koushanfar is being recognized for her contributions to secure computing and privacy-preserving machine learning. Koushanfar directs the Adaptive Computing and Embedded Systems (ACES) Lab at UC San Diego. The work from her lab has transformed the fields of hardware-based security, secure AI, and privacy-preserving computing. Koushanfar is also the founding co-director of the Center for Machine Intelligence, Computing and Security (MICS), an engineering research center at the UC San Diego Jacobs School of Engineering focused on technical innovation and diverse workforce development through the integration of hardware, software, AI algorithms, and data for scalable machine learning and security.

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DARPA comes to UC San Diego

The Defense Advanced Research Projects Agency (DARPA) hosted the grand finale of its first-ever national conference series at UC San Diego in December. UC San Diego receives more than $120 million in annual funding from the U.S. Department of Defense, the most of any University of California institution. "Our research philosophy and how we do research at UC San Diego aligns really well with DARPA, because we are both driven to create an innovation pipeline that advances foundational research all the way to viable problem-solving products and services that address a greater good," said UC San Diego Vice Chancellor of Research Corinne Peek-Asa. Intel and UC San Diego, for example, just joined a DARPA program that aims to prevent exploitation of computing systems.

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Amino Acid Eases Neuropathy in Diabetic Mice

Approximately half of people with type 1 or type 2 diabetes experience peripheral neuropathy—weakness, numbness, and pain, primarily in the hands and feet. The condition occurs when high levels of sugar circulating in the blood damage peripheral nerves. Now, working with mice, researchers at the Salk Institute and UC San Diego have identified another factor contributing to diabetes-associated peripheral neuropathy: altered amino acid metabolism. The study, published in *Nature*, adds to growing evidence that some often-underappreciated, "non-essential" amino acids play important roles in the nervous system. The findings may provide a new way to identify people at high risk for peripheral neuropathy, as well as a potential treatment option. Listen to Christian Metallo on the Nature podcast.

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Endowed Chair Honors Shao-Chi Lin

Renowned high energy density science expert Farhat Beg has been named the inaugural recipient of the Shao-Chi and Lily Lin Chancellor's Endowed Chair in Engineering Science at UC San Diego. Shao-Chi Lin was an internationally renowned aeronautical engineer at UC San Diego who pioneered excimer lasers, and specialized in gas dynamics, with applications in many areas including the re-entry of spacecraft into earth's atmosphere after space travel. Beg, a professor in the Department of Mechanical and Aerospace Engineering at UC San Diego, carries on Lin's legacy in terms of research, education, and workforce development. This endowed chair was established with a generous gift from Lily Lin in honor of her late husband Shao-Chi Lin.

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Join us for Research Expo on April 26

Looking to recruit top tech talent? Want to see the latest technologies in development, and talk with the graduate students and faculty bringing them to fruition? Join us on Thursday, April 26 for our 41st annual Jacobs School of Engineering Research Expo, to connect with students, faculty, alumni and industry partners of the #1 engineering school in the nation. Research Expo will be free of charge this year. Read about this year's Research Expo promotional visuals.

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