UC San Diego JACOBS SCHOOL OF ENGINEERING





NSF director inaugurates updated earthquake shake table

National Science Foundation Director Sethuraman Panchanathan was on hand for the grand reopening of UC San Diego's earthquake simulator. It is one of the two biggest shake tables in the world. The facility was recently upgraded with a \$16.9 million grant from NSF. It went from being able to move in one direction – east-west – to three directions – east-west, north-south, up and down, as well as roll, pitch and yaw, three motions in the x, y and z axes performed by airplanes in flight and commonly seen in earthquake motions. This will allow the facility to test structures with an unprecedented degree of accuracy when compared to real earthquake ground motions.

Learn more: bit.ly/ShakeTableUpgradeNSF

Wastewater provides early detection of SARS-CoV-2 virus

Scientists and physicians at UC San Diego and Scripps Research described how wastewater sequencing provided dramatic new insights into levels and variants of SARS-CoV-2 on campus and in the broader community — a key step to public health interventions in advance of COVID-19 case surges — in a recent issue of Nature. Rob Knight, a professor of pediatrics, computer science and bioengineering, and director of the Center for Microbiome Innovation, is co-senior author of the study. The study built on the UC San Diego Return to Learn program.



Learn more: <u>bit.ly/COVID19Wastewater</u>

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Mitigating faculty hiring bias through rubrics

A new in-depth case study in Science finds that rubrics helped mitigate gender bias in engineering faculty hiring decisions. At the same time, the researchers found evidence that substantial gender bias persisted in some rubric scoring categories and evaluators' written comments. Jacobs School bioengineering professor Stephanie Fraley is a corresponding author on this Science Policy Forum, and electrical engineering professor Pamela Cosman is an author. UC San Diego sociologist Mary Blair-Loy is the other corresponding author on this paper, which is part of a larger NSF-funded research project.

Learn more: bit.ly/AntiBiasRubrics

Colon cancer cleared in mice via antibody-and-plantvirus combo

A new combination therapy to combat cancer could one day consist of a plant virus and an antibody that activates the immune system's "natural killer" cells, shows a study by nanoengineers and radiologists at UC San Diego. In mouse models of colon cancer, the combination therapy eliminated all tumors and prevented their recurrence, which in turn resulted in 100% survival. The therapy also increased survival in mouse models of melanoma. This research is from the Jacobs School's Center for Nano-ImmunoEngineering.



Learn more: bit.ly/CancerComboTherapyPlantVirus

US-Mexico student research program breaks record

This summer, 185 high school and college students from the United States and Mexico are collaborating on real-world scientific research projects in labs at UC San Diego. These students are participating in the 9th annual ENLACE binational summer research program. The program, created, organized and run by Olivia Graeve, a mechanical and aerospace engineering professor, has expanded every summer, from five students from Tijuana in 2013, to 185 from across both countries in 2022. Graeve is also director of UC San Diego's campuswide graduate program in materials science and engineering.



Learn more: bit.ly/Enlace2022Kickoff



These energy-packed batteries work well in extreme cold and high heat

Engineers at UC San Diego have developed experimental lithium-ion batteries that perform well at freezing cold and scorching hot temperatures, while packing a lot of energy. Such batteries could allow electric vehicles in cold climates to travel farther on a single charge; they could also reduce the need for cooling systems to keep the vehicles' battery packs from overheating in hot climates. This research is from the Jacobs School's Sustainable Power and Energy Center.

Learn more: bit.ly/WideTempBattery

\$25M to build artificial coral reefs for coastal protection

A team including nanoengineers from UC San Diego has received a \$25 million award from DARPA to build artificial coral reefs to protect coastal areas in Hawai'i against flooding, erosion and storm damage. The nanoengineers are 3D printing biomaterials that coat the artificial reefs, enhancing coral recruitment. UC San Diego Scripps Institution of Oceanography researchers will broadcast sounds from healthy reef environments in order to attract both algae-eating fish and coral larvae to the structures.



Learn more: bit.ly/3DPrintReefsDARPA_UCSD



Netflix-style algorithm to predict tumor behavior

The science behind predicting your viewing habits on Netflix could one day be used to guide doctors in managing some of the hardest-to-treat cancers, shows a study led by bioengineers at UC San Diego and University College London. The researchers used AI to analyze and categorize the size and scale of DNA changes across the genome when cancer starts and grows. These categories of common DNA changes could be used to build a blueprint to predict how a cancer is likely to progress and design the most effective treatments for it

Learn more: bit.ly/CancerGenomeBlueprint

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