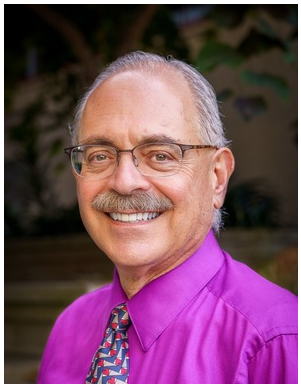
UC San Diego
JACOBS SCHOOL OF ENGINEERING

NEWS
November 2025

Fusion Now



For the California fusion innovation ecosystem **the moment is now.**

This is one of my takeaways from the statewide fusion convening we just held at UC San Diego, in conjunction with General Atomics and Lawrence Livermore National Laboratory.

Right now, universities, national labs and federal agencies are working together to solve the remaining R&D challenges that are holding back the ability of fusion startups to deliver power plants capable of running 24/7.

Also right now, fusion startups in California and around the country are in direct conversation with local and state government agencies regarding where to build pilot plants and future manufacturing facilities.

The fact that both of these things — and so much more — are happening **right now** across our fusion ecosystem is an indication of the dynamic, fast changing fusion R&D and commercialization environments we are all now operating in.

As an engineering dean at a school with a long-standing focus on fusion and fusion-enabling technologies, it's clear to me that universities and others in the public sector need to meet this moment. And in fact, there was broad consensus at our California fusion convening that we need to accelerate when it comes to public-private coordination across the state.

Here at UC San Diego, we are certainly giving it our best effort.

Just over a year ago, we launched the UC San Diego Fusion Engineering Institute. The work through the institute to build connections within UC San Diego, across the region and across that state has led to powerful positive impacts.

Earlier this month, professor Farhat Beg was awarded $4M in funding for a new collaborative fusion research effort funded by the University of California National Laboratory Fees Research Program to address tough shared challenges previously surfaced by the California fusion community — thanks in part to meetings we helped to convene last year.

The PISCES Lab founded by professor George Tynan is now running with an incredible upgrade. The $15 million U.S. Department of Energy award allowed for the addition of an ion beam accelerator to his lab's existing experimental infrastructure. The upgraded

facility fills an important need for fusion researchers in the public and private sectors working to develop new fusion reactor materials.

Earlier this year, scientists and engineers at General Atomics and UC San Diego established a Fusion Data Science and Digital Engineering Center in San Diego.

This year, UC San Diego became the new home to the nonprofit Fusion Power Associates (FPA). The program for the FPA 2025 annual meeting in DC next month is world class. The event is already at capacity for in person attendance.

And this is just scratching the surface — there is much more to come.

As I put the final touches on this column, I also see that the DOE has just added an Office of Fusion to their org chart. Things certainly are moving fast in fusion — **the moment is now.**

If you're interested in empowering UC San Diego to meet the fusion moment, please get in touch. I can't overstate the value of graduate fellowships in fusion — to give just one example.

In the meantime, I hope you have a wonderful Thanksgiving and restful weekend. As always, I can be reached at DeanPisano@ucsd.edu.

Sincerely,

Al

Albert ("Al") P. Pisano
Dean, UC San Diego Jacobs School of Engineering
Special Adviser to the Chancellor for Campus Strategic Initiatives

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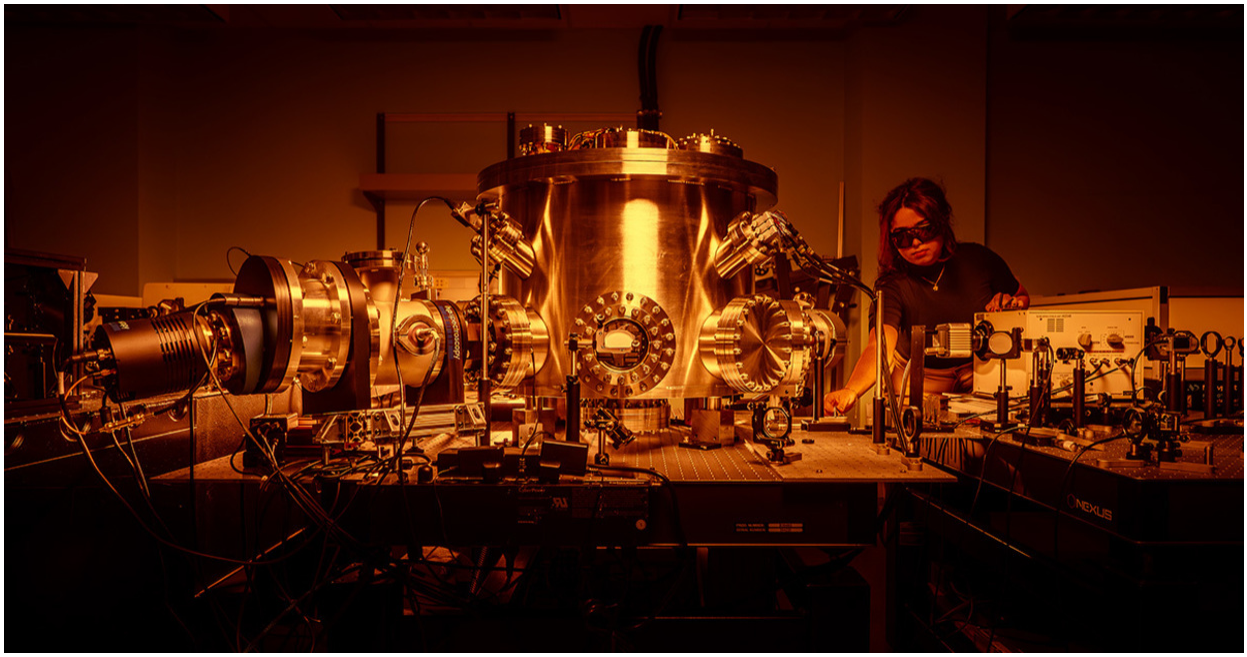

California Cements Fusion Leadership at First Statewide Summit

More than 200 leaders from government, industry, national labs and academia gathered at UC San Diego for the first statewide convening to accelerate California's fusion energy economy. The message was clear: Now is the time to double down and solve the remaining challenges holding back abundant fusion energy — and California is extremely well positioned to do this. Working collaboratively, California can turn the promise of abundant, stable, clean energy from fusion into a commercial reality for the nation and the world. The summit was hosted by UC San Diego, Lawrence Livermore National Laboratory, and General Atomics.

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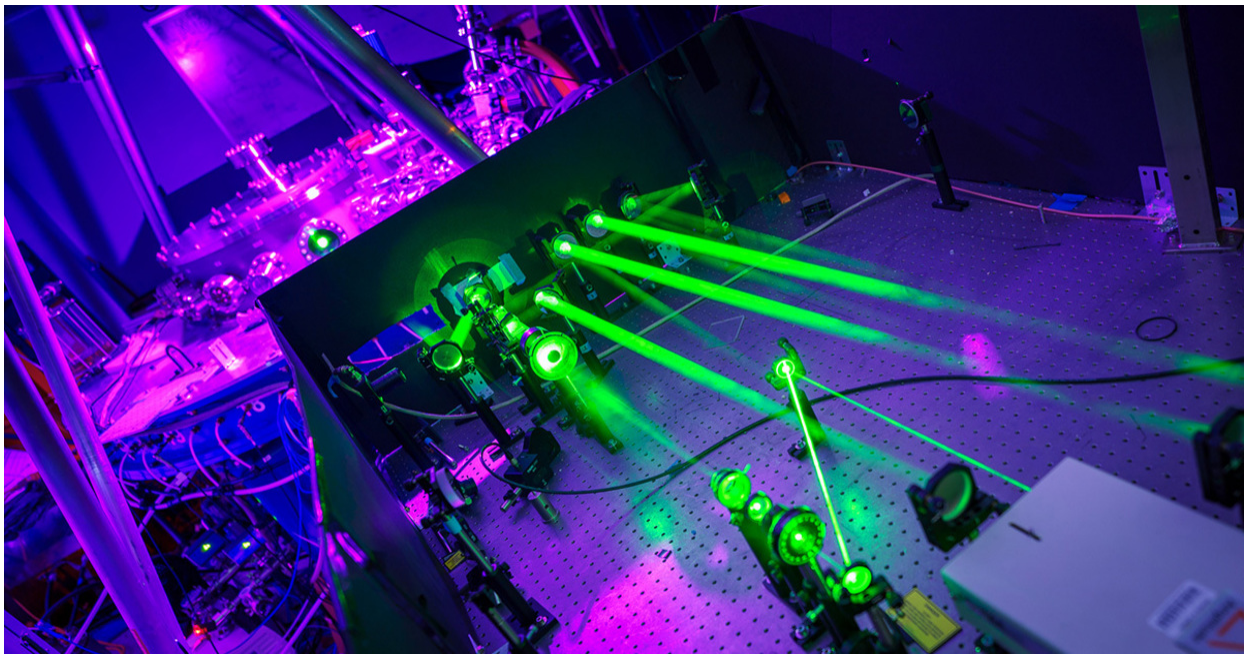

We are Leading a New Effort to Make Fusion Energy a Practical Reality

With $4 million from the University of California National Laboratory Fees Research Program, researchers at UC San Diego will lead a new multi-institution research effort aimed at solving materials, fuel, diagnostic and workforce challenges required to make clean, affordable fusion energy a commercial reality. The new California Center for Fusion Energy – Materials and Diagnostics for Extreme Conditions (MDEC) is a strategic partnership among UC San Diego, UCLA, UC Irvine, UC Santa Cruz and two national labs — Lawrence Livermore and Los Alamos.

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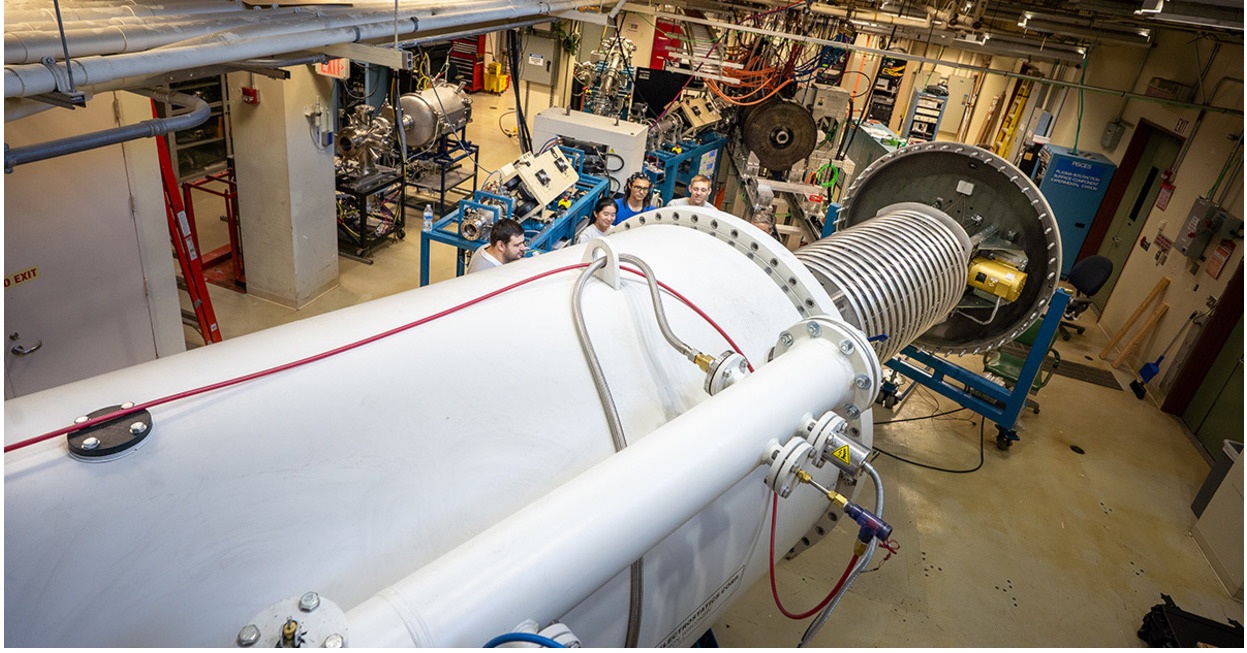

Upgraded Facility Accelerates Efforts to Develop Materials for Fusion

An upgraded fusion research facility at UC San Diego is expected to reduce the time and cost required to develop and demonstrate new materials that are fit to line the walls of fusion reactors. Researchers will now be able to expose materials samples to both fusion plasmas and to high-energy ions at the same time, in a controlled experimental setting. This is thanks to a $15 million Department of Energy award that funded the addition of a new ion beam accelerator.

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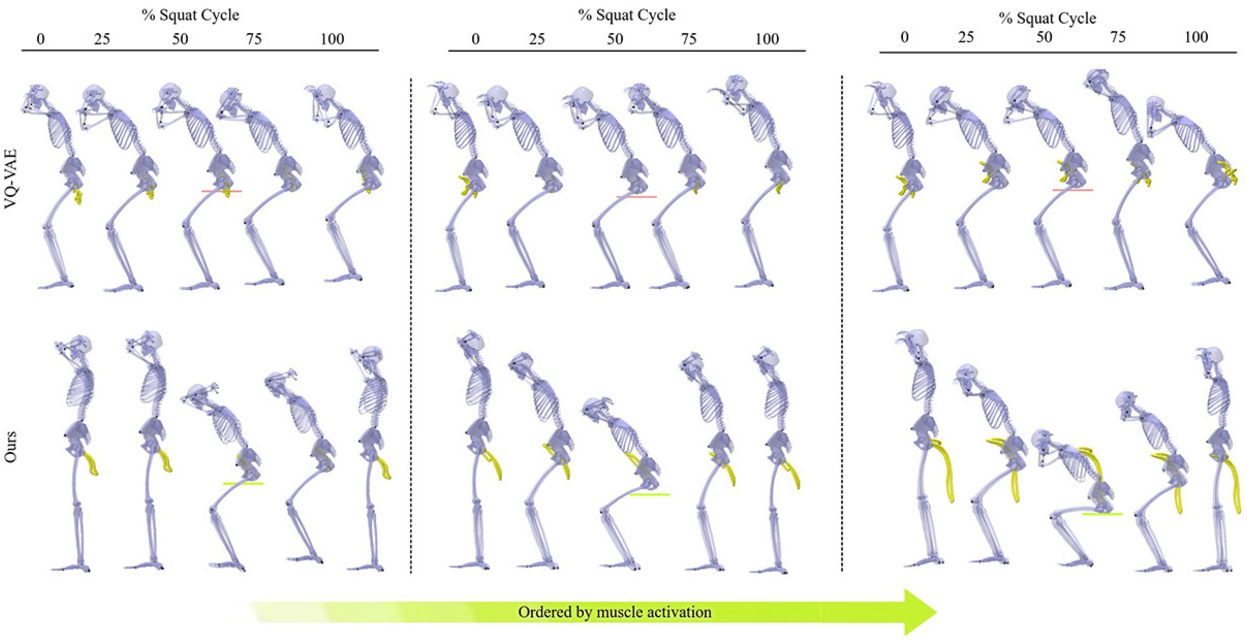

A Generative AI Tool to Help Athletes Avoid Injuries

Generative AI can be harnessed to prevent injuries in athletes and also aid in rehabilitation after an injury. Bioengineers and computer scientists at the Jacobs School

developed a model trained with athlete movements together with information about the biomechanical constraints on the human body, such as how much force a muscle can develop. This tool can generate videos that show the best motions athletes can execute during exercise to avoid injury and improve performance, or the best motions for athletes that need rehabilitation after an injury. Next steps include personalizing the model for specific individuals.

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Biomanufacturing the Pigment for Octopus Camouflage

UC San Diego researchers developed a new way to biomanufacture large amounts of the octopus “camouflage pigment,” xanthommatin. A complex process involving this pigment is what allows octopuses, squids and other cephalopods to change the color of skin to blend in with their environment. The new method for producing large amounts of this color-changing, nature-inspired pigment involves robots and bioinformatics tools developed in bioengineering professor Adam Feist’s lab. The pigment could have potential applications in natural sunscreens, color-changing household paints and environmental sensors.

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Transforming Computer Science Education in the Age of AI

UC San Diego has launched a global consortium with support from Google.org – Google's philanthropic arm – to help teach the next generation of coders. The consortium brings together experts from education and nonprofit organizations, as well as industry and academia, comprising thousands of educators in dozens of countries around the world, who in turn will impact tens of thousands of students. The funding is part of Google's recently announced $1 billion commitment to education in the United States.

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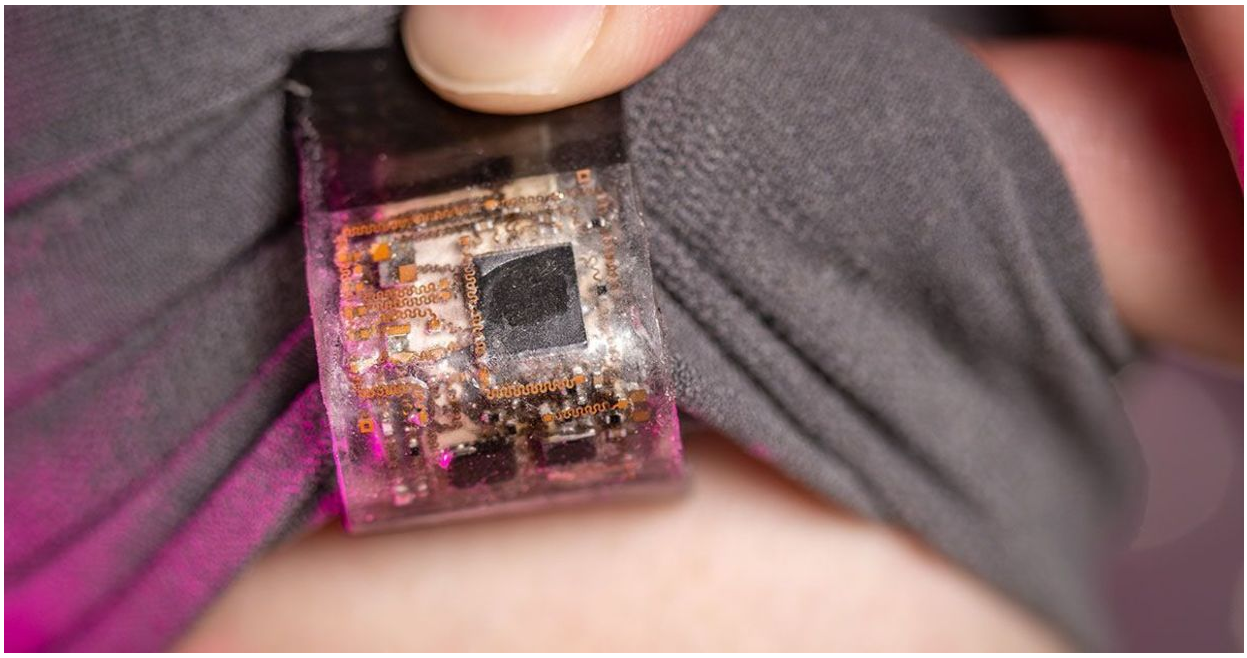

Wearable Lets Users Control Machines and Robots While on the Move

A next-gen wearable system, developed by engineers at the Jacobs School, enables people to control machines using everyday gestures — even with excessive motion in the

background, such as while a person is running, riding in a car or floating on turbulent ocean waves. The system combines stretchable electronics with AI to overcome a long-standing challenge in wearable technology: reliable recognition of gesture signals in real-world environments.The technology could enable patients in rehabilitation or individuals with limited mobility, for example, to use natural gestures to control robotic aids without relying on fine motor skills.

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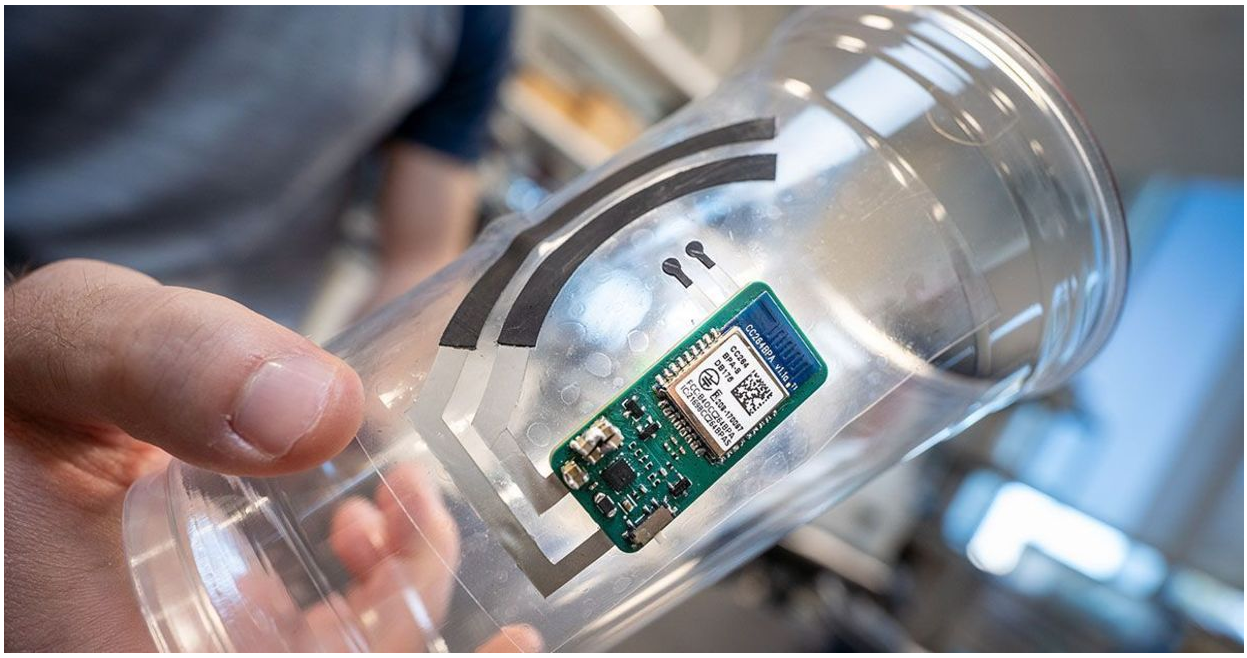

Sweat-powered Sticker Turns Your Drinking Cup into a Health Sensor

An electronic sticker can use the sweat from a person's fingertips to both harvest energy and monitor that person's vitamin C levels — no blood draws, lab visits or batteries required. This project is part of a larger effort at the Jacobs School to generate real-time insights into human health and wellness through smart sensing technologies. In this new work, the flexible sticker, which attaches to everyday objects such as a disposable drinking cup, collects trace amounts of sweat as a person grips the cup. Within minutes, the system harvests enough power from the sweat to analyze it for vitamin C and wirelessly sends the results to a nearby laptop.

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