

Tuning Electrode Surfaces to Optimize Solar Fuel Production

[Scientists have demonstrated that modifying the topmost layer of atoms](#) on the surface of electrodes can have a remarkable impact on the activity of solar water splitting. As they reported in Nature Energy on Feb. 18, bismuth vanadate electrodes with more bismuth on the surface (relative to vanadium) generate higher amounts of electrical current when they absorb energy from sunlight.

Are 'Bacterial Probiotics' a Game-changer for the Biofuels Industry?

[In a study recently published in Nature Communications, scientists](#) from The Novo Nordisk Foundation Center for Biosustainability (DTU) and Yale University have investigated how bacteria that are commonly found in sugarcane ethanol fermentation affect the industrial process. By closely studying the interactions between yeast and bacteria, it is suggested that the industry could improve both its total yield and the cost of the fermentation processes by paying more attention to the diversity of the microbial communities and choosing between good and bad bacteria.

Ultrasound Has Potential to Damage Coronaviruses, Study Finds

[A new study by researchers in MIT's Department of Mechanical Engineering](#) suggests that coronaviruses may be vulnerable to ultrasound vibrations, within the frequencies used in medical diagnostic imaging. Through computer simulations, the team has modeled the virus' mechanical response to vibrations across a range of ultrasound frequencies. They found that vibrations between 25 and 100 megahertz triggered the virus' shell and spikes to collapse and start to rupture within a fraction of a millisecond.

Standard Digital Camera and AI to Monitor Soil Moisture for Affordable Smart Irrigation

[Researchers at UniSA have developed a cost-effective new technique](#) to monitor soil moisture using a standard digital camera and machine learning technology. Researchers from The University of South Australia and Baghdad's Middle Technical University have developed a cost-effective alternative that may make precision soil monitoring simple and affordable in almost any circumstance. This monitoring system could potentially be trained to recognize the specific soil conditions of any location.

Recyclable 'Veggie' Battery Could Power Future Devices More Efficiently

[A new type of 3D-printed battery which uses electrodes made from vegetable](#) starch and carbon nanotubes could provide mobile devices with a more environmentally-friendly, higher-capacity source of power. A team of engineers led from the University of Glasgow have developed the battery in a bid to make more sustainable lithium-ion batteries capable of storing and delivering power more efficiently. The battery's design and fabrication is outlined in a paper published in the Journal of Power Sources.

A Stable Copper Catalyst for Carbon Dioxide Conversion

[A new catalyst for the conversion of carbon dioxide \(CO₂\)](#) into chemicals or fuels has been developed by researchers at Ruhr-Universität Bochum and the University of Duisburg-Essen. They optimized already available copper catalysts to improve their selectivity and long-term stability. Researchers are pursuing the idea of converting CO₂ electrochemically with the help of renewable energies. This would not only create useful products; they would also serve as storage for the renewable energies.

