

An Unexpected Gray Area Could Bring About Long-Lasting Solar Cells

[University of Wisconsin-Madison materials engineers](#) have made a surprising discovery that could dramatically improve the lifetime of solar energy harvesting devices. The findings published in *Nano Letters* allowed them to achieve the longest-ever lifetime for the photoelectrochemical electrode, which uses sunlight to split water into its constituent parts of hydrogen and oxygen.

Nanocatalysts Developed for Continuous Biofuel Synthesis

[A chemist from The Peoples' Friendship University of Russia has synthesized](#) new catalysts with ruthenium (Ru) nanoparticles for producing biofuel from organic biowaste. Nanocatalysts support more intensive and sustained reactions than the compounds currently available in the market. The results of the study were published in the *ChemSusChem* journal.

Breakthrough Opens Door to \$100 Ultrasound Machine

[Engineers at the University of British Columbia have developed](#) a new ultrasound transducer, or probe, that could dramatically lower the cost of ultrasound scanners to as little as \$100. Their patent-pending innovation—no bigger than a Band-Aid—is portable, wearable and can be powered by a smartphone. The research was published recently in *Nature Microsystems & Nanoengineering*.

Researcher Creates Hydrogels Capable of Complex Movement

[Kyungsuk Yum, an assistant professor in UTA's Materials Science and Engineering Department](#), and his doctoral student, Amirali Nojoomi have recently published groundbreaking research in *Nature Communications*. They have developed a process by which 2-D hydrogels can be programmed to expand and shrink in a space- and time-controlled way that applies force to their surfaces, enabling the formation of complex 3-D shapes and motions.

Newly Discovered Enzyme Is 'Firing Pin' For Plant Immunity

[Just like humans, plants have an immune system that helps them fight off infections.](#) Gitta Coaker, professor in the Department of Plant Pathology at UC Davis and colleagues have now identified a key step in how plant cells respond to pathogens; a family of kinase enzymes that activate the enzymes that make reactive oxygen. The work is published Sept. 12 in the journal *Cell Host & Microbe*.

Algae Could Help Increase Yield in Wheat and Other Crops

[A team from the Australian National University \(ANU\)](#) has discovered how to insert tiny compartments from blue-green algae, called carboxysomes, into plants. Carboxysomes are responsible for making cyanobacteria so efficient at transforming carbon dioxide into energy-rich sugars. This could lead to a 60 percent increase in plant growth and yield like wheat, cowpeas and cassava.

Keep Cool: Researchers Develop Magnetic Cooling Cycle

[Researchers at the Technische Universität \(TU\) Darmstadt](#) and the Helmholtz-Zentrum Dresden-Rossendorf (HZDR) have developed the idea of a cooling cycle based on the 'magnetic memory' of special alloys. Relevant initial experimental results have now been published in *Nature Materials*. The researchers generated the magnetic field using the strongest permanent magnets known to date – containing the rare-earth metal neodymium in addition to iron and boron.