

GLIMPSES OF THE FUTURE

A monthly digest of technologies, developments and trends that will shape our lives.

Spray-On Film Turns Windows Into Solar Panels

Norwegian solar power company EnSol has patented a [thin film solar cell technology designed to be sprayed on to windows](#) and similar surfaces.

Unlike traditional silicon-based solar cells, the film is composed of metal nanoparticles embedded in a transparent composite matrix, and operates on a different principle. EnSol is now developing the product with help from the [University of Leicester's Department of Physics and Astronomy](#).

Ultimately, [EnSol](#) hopes to achieve a cell efficiency of at least 20 percent, and have its product ready for the commercial market by 2016.

Smart Phones Become Translation Tools

For the past four years, scientists at America's National Institute of Standards and Technology (NIST) have been conducting detailed performance evaluations of speech translation systems for the Defense Advanced Research Projects Agency (DARPA). Now US Marines in Afghanistan are using a new [smartphone-based device that translates English into Pashto and then Pashto back into English](#).

Previous systems used microphones and portable computers. In the most recent tests, the NIST team evaluated three two-way, real-time, voice-translation smartphone devices designed to improve communications between the U.S. military and non-English speakers in foreign countries.

Traditionally, the military has relied on human translators for communicating with non-English speakers in foreign countries, but the job is dangerous and skilled translators often are in short supply.

Scaffolding To Help Mend A Broken Heart

The majority of people survive a heart attack, but the damage done to the heart muscle is irreversible. As a result, most patients eventually succumb to congestive heart failure, the most common cause of death in developed countries.

Stem cells offer hope for achieving what the human body can't do: mending broken hearts. Now researchers have built [a scaffold that supports the growth and integration of stem cell-derived cardiac muscles cells](#).

The scaffold supports the growth of cardiac cells in the lab and encourages blood vessel growth in living animals.

Surfing At Night - With Headlights

A keen surfer in California has created a one-of-a-kind surfboard [complete with headlights designed specifically for](#)

Speedboat That Can Go Beneath The Waves

[Scubacraft](#) is a new speedboat that has one feature no other leisure boats can provide [the ability to submerge](#).

The 1500cc boat will take you underwater at the press of a button, provided that you're wearing the proper scuba gear. When you're under, this toy will speed you through the waters, at down to 100 feet (30 meters) depth, thanks to a 160 HP engine, which provides enough power for the craft to reach 50mph (80km/h) on the surface.

The open-cockpit design allows owners to forgo most of the rigorous training needed to pilot pressurized vessels, although full scuba gear and certification are required for the driver and two passengers.

Orders for the versatile new machine are currently being taken, and delivery is expected next year. Price for the watercraft is from \$120,000.

Plastic Memory Chips Developed

Researchers at Ohio State University have demonstrated the first [plastic computer memory device](#) that utilizes the spin of electrons to read and write data. An alternative to traditional microelectronics, the 'spintronics' device could store more data in less space, process data faster, and consume less power, it is claimed.

Normal electronics encode computer data based on a binary code of ones and zeros, depending on whether an electron is present in a void within the material.

But researchers have long known that electrons can be polarized to orient in particular directions, like a bar magnet. They refer to this orientation as spin — either 'spin up' or 'spin down' — and have been working on a way to store data using spin. The resulting electronics, dubbed 'spintronics', would effectively let computers store and transfer twice as much data per electron.

Biological Viruses May Improve Battery Life

Scientists at MIT have reported progress in [using a common virus to develop improved materials for high-performance, rechargeable lithium-ion batteries](#) that could be woven into clothing to power portable electronic devices.

These new power sources could in the future be woven into fabrics such as uniforms or ballistic vests, and poured or sprayed into containers of any size and shape. These conformable batteries could power smart phones, GPS units, and other portable electronic devices.

Jet Fuel from Plants

[surfing at night](#).

Dubbed the Night Stalker, Bill Stewart's creation is the first ever shortboard to pack LEDs embedded in the side fins and two 700 lumen headlights contained with the board's transparent plexiglass nose to form a pair of surfboard headlights.

North Korea Develops Radar-Absorbing Paint

North Korea is believed to have developed [a radar absorbing paint to conceal its fighter jets, warships and tanks from surveillance](#) and from reconnaissance aircraft flown by South Korea and the United States, a report said recently.

According to the daily [Chosun Ilbo](#), which obtained a classified North Korea field manual published in 2005, North Korea's military has also built numerous fake foxholes and caves near the Demilitarised Zone to evade precision strikes.

The 80-page handbook gives detailed instructions on how to make and apply stealth paint, which absorbs radar waves, the newspaper said.

Energy Storage System To Top Up Peak Electricity Supply

It is very difficult to store excess electricity so power stations and distribution grids are built with capacity to supply peak demands - which is underused and very wasteful at other times. Now, researchers at the University of Leeds have developed [a way to store excess power](#) - which might make future generation facilities much more efficient

The key idea is for power stations to use excess electricity to run a unit producing liquid nitrogen and oxygen - or 'cryogen'. At times of peak demand, the nitrogen would be boiled – using heat from the environment and waste heat from the power plant. The hot nitrogen gas would then be used to drive a turbine or engine, generating 'top up' electricity.

Meanwhile, the oxygen would be fed to the combustor to mix with the natural gas before it is burned. Burning natural gas in pure oxygen, rather than air, makes the combustion process more efficient and produces less nitrogen oxide. Instead, this 'oxy-fuel' combustion method produces a concentrated stream of carbon dioxide that can be removed easily in solid form as dry ice.

Researchers at a startup company in Colorado [have turned plant scraps into jet fuel](#), an important demonstration that high-energy fuels can be made efficiently from renewable and abundant biomass.

The company, [Gevo](#), has engineered a yeast that helps transform the cellulose found in wood chips and plant stalks into butanol, an ingredient of gasoline. The researchers can then modify the butanol into jet fuel.

Butanol has 30 percent more energy than an equal amount of a conventional biofuel such as ethanol. Because of that appeal researchers have been developing ways to cheaply and efficiently produce butanol from renewable sources.

Mali Researchers To Rear Malaria-resistant GM Mosquitoes

A laboratory in Mali will soon be rearing Africa's first mosquitoes that are [genetically modified to resist malaria](#).

The laboratory, at the [Malaria Research and Training Centre, University of Bamako](#), was officially opened earlier this month.

The lab's research is part of a partnership, between the University of Bamako and Keele University in the United Kingdom, which aims to develop GM mosquitoes to fight malaria.

The researchers hope that resistant mosquitoes will one day take over wild populations, eventually wiping malaria out.

Researchers Develop 'Cluster Bomb' Therapy To Target Cancer Cells

Conventional chemotherapy treatments for cancer use a 'shotgun approach' that also damages healthy cells bringing debilitating side effects such as nausea, liver toxicity and a battered immune system. Now [a new way to deliver this life-saving therapy](#) to cancer patients by getting straight to the source of the disease has been developed.

The [researchers at Tel Aviv University](#) responsible for the breakthrough delivery vehicle liken it to a 'cluster bomb for cancer' because of its ability to deliver the drugs directly into cancer cells before releasing its chemotherapeutic payload.

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