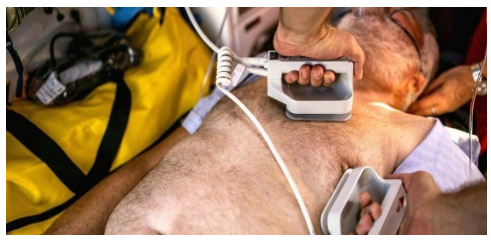
Weekly Discovery

We SHARE to inspire and ignite ideas!

20 - 24 February 2023

AI

AI supports doctors' hard decisions on cardiac arrest



"When patients receive care after cardiac arrest, doctors can now — by entering patient data in a web-based app — find out how thousands of similar patients have fared. Researchers at the University of Gothenburg have developed three such systems of decision support for cardiac arrest that may, in the future, make a major difference to doctors' work."

Source: GU (13 February 2023)

AI

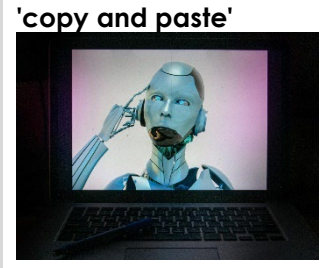
AI analyses cell movement under the microscope

"The enormous amount of data obtained by filming biological processes using a microscope has previously been an obstacle for analyses. Using artificial intelligence (AI), researchers at the University of Gothenburg can now follow cell movement across time and space. The method could be very helpful for developing more effective cancer medications."

Source: GU (16 February 2023)

AI

Beyond memorization: Text generators may plagiarize beyond 'copy and paste'



"The researchers focused on identifying three forms of plagiarism: verbatim, or directly copying and pasting content; paraphrase, or rewording and restructuring content without citing the original source; and idea, or using the main idea from a text without proper attribution. They constructed a pipeline for automated plagiarism detection and tested it against OpenAI's GPT-2 because the language model's training data is available online, allowing the researchers to compare generated texts to the 8 million documents used to pre-train GPT-2."

Source: PSU (16 February 2023)

ENERGY

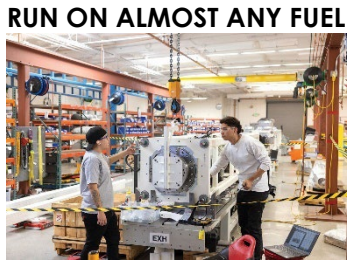
Stretchy Devices Spin Electricity From Body Heat

"Researchers have now made a thermoelectric generator (TEG) that is soft and stretchy and that biodegrades completely when exposed to the environment. Unlike conventional rigid thermoelectric devices, this one, reported in the journal Science Advances, could be easily integrated into fabrics, allowing for body-heat-powered wearable sensors or temperature-detecting disposable face masks."

Source: IEEE (15 February 2023)

ENERGY

THIS NEW BREED OF GENERATOR CAN RUN ON ALMOST ANY FUEL



"It's January 2030 and your electric heat pump is warming the house while your electric car charges in the garage, all powered by solar panels on your roof and by wind and solar generators at your local utility. It doesn't matter that it's been raining for two weeks because your utility is tapping into ammonia produced with last summer's sunshine. It's consuming that ammonia in a linear generator.

The linear generator can quickly switch between different types of green (and not-so-green, if need be) fuel, including biogas, ammonia, and hydrogen. It has the potential to make the decarbonized power system available, reliable, and resilient against the vagaries of weather and of fuel supplies. And it's not a fantasy; it's been developed, tested, and deployed commercially."

Source: IEEE (18 February 2023)

ENERGY

Skies Begin to Clear for Hydrogen-Powered Flight

"The 19-seater Dornier 228 propeller plane that took off into the cold blue January sky looked ordinary at first glance. Spinning its left propeller, however, was a 2-megawatt electric motor powered by two hydrogen fuel cells—the right side ran on a standard kerosene engine—making it the largest aircraft flown on hydrogen to date. Val Miftakhov, founder and CEO of ZeroAvia, the California startup behind the 10-minute test flight in Gloucestershire, England, called it a "historical day for sustainable aviation."

Source: IEEE (17 February 2023)

HEALTH TECH

Ingestible sensor could help doctors pinpoint GI difficulties

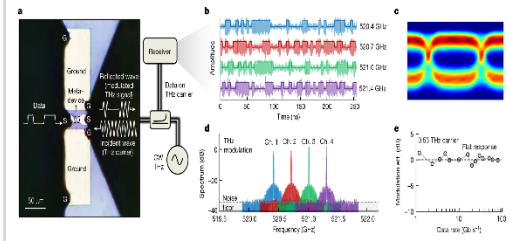
"Engineers at MIT and Caltech have demonstrated an ingestible sensor whose location can be monitored as it moves through the digestive tract, an advance that could help doctors more easily diagnose gastrointestinal motility disorders such as constipation, gastroesophageal reflux disease, and gastroparesis.

The tiny sensor works by detecting a magnetic field produced by an electromagnetic coil located outside the body. The strength of the field varies with distance from the coil, so the sensor's position can be calculated based on its measurement of the magnetic field."

Source: MIT (13 February 2023)

ICT

Electronic metadevices break barriers to ultra-fast communications

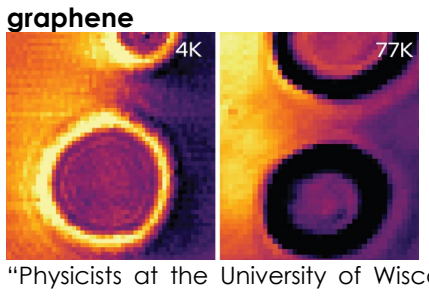


"EPFL researchers have come up with a new approach to electronics that could launch the next generation of ultra-fast devices for exchanging massive amounts of data, with applications in 6G communications and beyond."

Source: EUREKALERT (17 February 2023)

MATERIALS

Smooth sailing for electrons in graphene

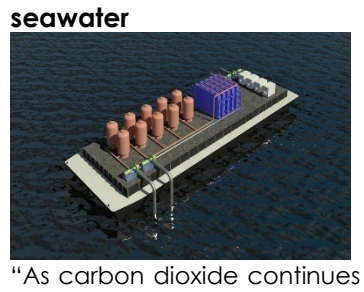


"Physicists at the University of Wisconsin–Madison directly measured, for the first time at nanometer resolution, the fluid-like flow of electrons in graphene. The results, which will appear in the journal Science on Feb. 17, have applications in developing new, low-resistance materials, where electrical transport would be more efficient."

Source: WISE! (16 February 2023)

SUSTAINABILITY

How to pull carbon dioxide out of seawater



"As carbon dioxide continues to build up in the Earth's atmosphere, research teams around the world have spent years seeking ways to remove the gas efficiently from the air. Meanwhile, the world's number one "sink" for carbon dioxide from the atmosphere is the ocean, which soaks up some 30 to 40 percent of all of the gas produced by human activities…

Now, a team of researchers at MIT says they may have found the key to a truly efficient and inexpensive removal mechanism. The findings were reported this week in the journal Energy and Environmental Science, in a paper by MIT professors..."

Source: MIT (16 February 2023)

SUSTAINABILITY

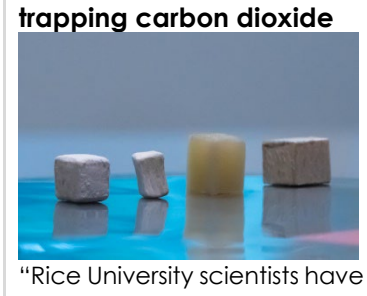
New superalloy could cut carbon emissions from power plants

"As the world looks for ways to cut greenhouse gas emissions, researchers from Sandia National Laboratories have shown that a new 3D-printed superalloy could help power plants generate more electricity while producing less carbon."

Source: Eurekalert (16February 2023)

SUSTAINABILITY

Engineered wood grows stronger while trapping carbon dioxide



"Rice University scientists have figured out a way to engineer wood to trap carbon dioxide through a potentially scalable, energy-efficient process that also makes the material stronger for use in construction.

Structural materials like steel or cement come at a high cost both in dollars and carbon dioxide emissions; building construction and use accounts for an estimated 40% of emissions. Developing sustainable alternatives to existing materials could help mitigate climate change and reduce carbon dioxide emissions."

Source: RICE (16 February 2023)

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