SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Weekly Discovery

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4 - 8 April 2022

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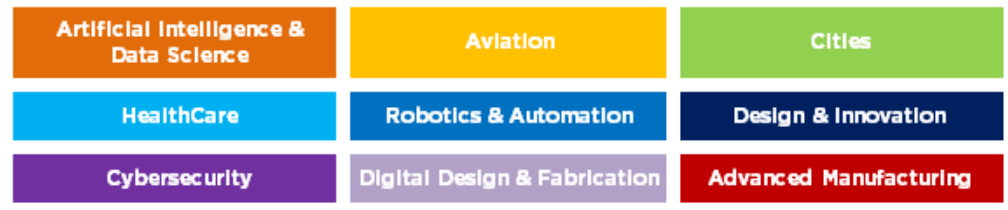


5G TECHNOLOGY

The Future of 5G+ Infrastructure Could be Built Tile by Tile

"Tentzeris says his team's modular application equipped with 5G+ capability has the potential for immediate, large-scale impact as the telecommunications industry continues to rapidly transition to standards for faster, higher capacity, and lower latency communications."

Source: Georgia Institute of Technology (29 March 2022)

BATTERY

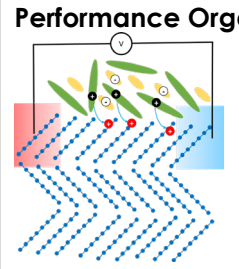
Scavenger Nanoparticles Could Make Fuel Cell-Powered Vehicles A Reality

"Engineers have developed a material that could give fuel cell systems a competitive edge over the battery systems that currently power most electric vehicles."

Source: University of Illinois Chicago (30 March 2022)

ENERGY

Converting Body Heat Into Electricity: A Step Closer Towards High-Performance Organic Thermoelectrics



"The team around Prof. Karl Leo investigated the charge and thermoelectric transport in modulation-doped large-area rubrene thin-film crystals with different crystal phases. They were able to show that modulation doping allows achieving superior doping efficiencies even for high doping densities, when conventional bulk doping runs into the reserve regime. Modulation-doped orthorhombic rubrene achieves much improved thermoelectric power factors."

Source: Eurekalert! (4 April 2022)

MATERIALS

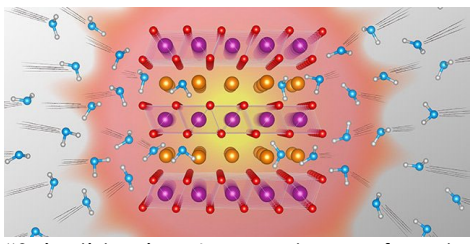
New Polymer Membrane Tech Improves Efficiency of CO2 Capture

"A longstanding challenge for such membranes has been a trade-off between permeability and selectivity. The higher the permeability, the more quickly you can move gas through the membrane. But when permeability goes up, selectivity goes down – meaning that nitrogen, or other constituents, also pass through the membrane quickly – reducing the ratio of CO2 to other gases in the mixture. In other words, when selectivity goes down you capture relatively less CO2."

Source: NC State (1 April 2022)

MATERIAL SCIENCE

The Material that Could Save Industries Heat

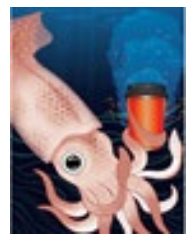


"Scientists in Japan have found a common substance that can reversibly and rapidly store and release relatively large amounts of low-grade heat without decomposing. The research could lead to more efficient reuse of industrial waste heat."

Source: Tohoku University (4 April 2022)

MATERIAL SCIENCE

Squid Skin-Inspired Cup Cozy Will Keep Your Hands Cool And Your Coffee Hot



"Drawing inspiration from cephalopod skin, engineers at the University of California, Irvine invented an adaptive composite material that can insulate beverage cups, restaurant to-go bags, parcel boxes and even shipping containers."

Source: University of California - Irvine (28 March 2022)

MEDTECH

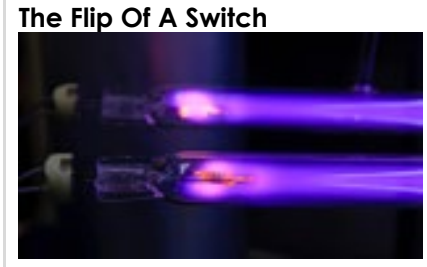
Personalised 'Smart Dressings' Set To Transform Treatment Of Chronic Wounds

"a team of scientists from the University of Brighton aim to drastically reduce that human and financial cost. Their aim is to create a new generation of 'theranostic' dressings which not only actively speed up wound healing but also provide doctors with diagnostic information on the patient's healing process."

Source: Brighton University (30 March 2022)

OPTICS

'An Underutilized Tool:' UV-LED Lights Can Kill Coronaviruses And HIV With The Flip Of A Switch

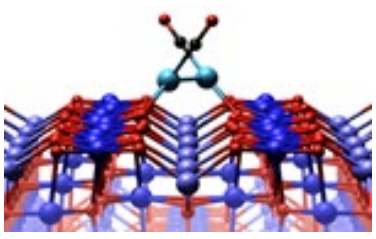


"The same lightbulbs used in offices and public spaces can destroy coronaviruses and HIV, according to a new studyOpens an external site in a new window from U of T Scarborough."

Source: University of Toronto (28 March 2022)

PHYSICS

The Platinum Riddle

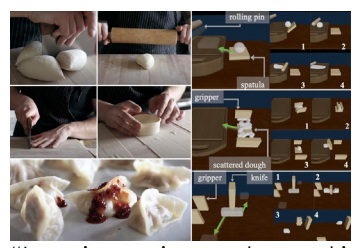


"Now, with the help of atomic-scale microscope images and complex computer simulations, they have been able to show that both the catalyst itself and the material on which it is anchored assume energetically unfavorable "metastable" states for a short time to allow the reaction to happen in a special way."

Source: Vienna University of Technology (4 April 2022)

ROBOTICS

Solving The Challenges Of Robotic Pizza-Making



"Imagine a pizza maker working with a ball of dough. She might use a spatula to lift the dough onto a cutting board then use a rolling pin to flatten it into a circle. Easy, right? Not if this pizza maker is a robot."

Source: MIT News (31 March 2022)

STATISTICS

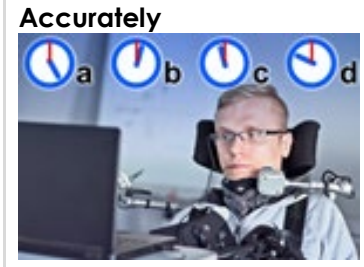
Understanding the Use of Bicycle Sharing Systems with Statistics

"Though bicycle sharing systems (BSSs) are popular in many big cities, it is necessary to actively rebalance the number of bicycles across the various ports with optimization algorithms. In a recent study, Tokyo University of Science researchers statistically analyzed the bicycle usage patterns in four real-world BSSs to obtain realistic benchmarks for testing these algorithms. Their findings can make BSS rebalancing more efficient through an understanding of the social dynamics of human movement."

Source: Tokyo University of Science (4 April 2022)

TECHNOLOGY

System Helps Severely Motor-Impaired Individuals Type More Quickly And Accurately



"A more flexible system being developed by researchers at MIT places individual selection indicators next to each option on a computer screen…The system, called Nomon, incorporates probabilistic reasoning to learn how users make selections, and then adjusts the interface to improve their speed and accuracy."

Source: MIT (5 April 2022)

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