SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

# Weekly Discovery

We SHARE to inspire and ignite ideas!

10 - 14 January 2022

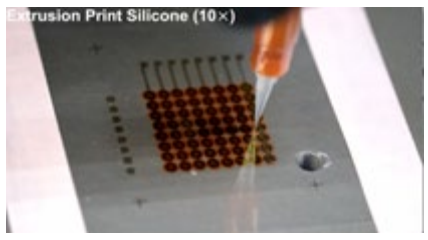
The Library publishes **9 alerts** focusing on Topics relevant to **growth and research areas** to SUTD.

Stay up to date by **subscribing** to any of these **9 Topical Reports** - CLICK HERE TO SUBSCRIBE NOW

Artificial Intelligence & Data Science | Aviation | Cities
HealthCare | Robotics & Automation | Design & Innovation
Cybersecurity | Digital Design & Fabrication | Advanced Manufacturing

3D PRINTING

## Researchers Develop First Fully 3D-Printed, Flexible OLED Display




"In a groundbreaking new study, researchers at the University of Minnesota Twin Cities used a customized printer to fully 3D print a flexible organic light-emitting diode (OLED) display. The discovery could result in low-cost OLED displays in the future that could be widely produced using 3D printers by anyone at home, instead of by technicians in expensive microfabrication facilities."

Source: UNIVERSITY OF MINNESOTA (7 January 2022)

E-WASTE

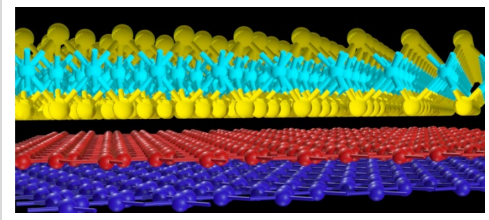
## E-Waste Is A Cybersecurity Problem, Too Toxic Chemicals Can Leach Out Of Old Devices—But So Can Sensitive Data

"The world generated a record 53.6 million metric tons of electronic waste in 2019, up more than 21 percent over five years, according to the United Nations' most recent assessment...Only about 17 percent of that e-waste was recycled, and what happens to the rest can be detrimental for both human health and privacy. A new systematic review by The Lancet found that "people living in e-waste exposed regions had significantly elevated levels of heavy metals and persistent organic pollutants," and it advocated for "novel cost-effective methods for safe recycling operations…to ensure the health and safety of vulnerable populations."

Source: IEEE Spectrum (7 January 2022)

GRAPHENE

## Magnetic Surprise Revealed In 'Magic-Angle' Graphene



"Magnets and superconductors don't normally get along, but a new study shows that 'magic-angle' graphene is capable of producing both superconductivity and ferromagnetism, which could be useful in quantum computing."

Source: Brown University (6 January 2022)

HEALTHCARE

## Virtual Reality Could Help Make Therapy Easier

"The Edith Cowan University (ECU) study found 30 per cent of people prefer to talk about negative experiences with a virtual reality avatar, rather than a person.
Researchers compared social interactions where people engaged in VR conversation versus face-to-face.
They used full face and body motion capture technology to create a 'realistic motion avatar' that closely mimicked their real-life counterpart, then analysed how people interacted with avatars compared to people."

Source: ECU (5 January 2022)

MACHINE LEARNING

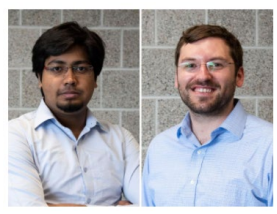
## Seeking A Way Of Preventing Audio Models For AI Machine Learning From Being Fooled

"Artificial intelligence (AI) is increasingly based on machine learning models, trained using large datasets. Likewise, human-computer interaction is increasingly dependent on speech communication, mainly due to the remarkable performance of machine learning models in speech recognition tasks."

Source: UNIVERSITY OF THE BASQUE COUNTRY (6 January 2022)

MATERIAL MODELING

## Engineers Develop New Software Tool To Aid Material Modeling Research

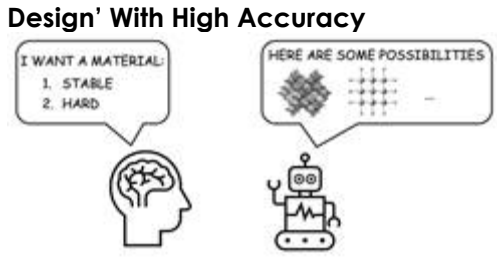


"A new software tool can accelerate materials science research by cutting out tedious background research on material properties… researchers recently debuted propSym, an open-source software on the programming platform MATLAB, to calculate the fundamental constants needed to describe the physical properties of solids.

Source: Penn State (5 January 2022)

MATERIALS

## SMART Researchers Discover Novel Way To Perform 'General Inverse Design' With High Accuracy

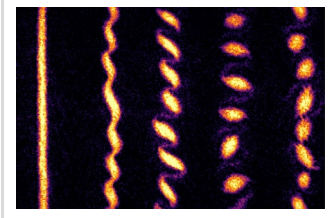



"This breakthrough paves the way for further development of a burgeoning and fast-moving field that could eventually enable the use of machine learning to accurately identify materials based on a desired set of user-defined properties. This could be revolutionary for materials science and have vast industrial benefits and use cases."

Source: SMART (6 January 2022)

PHYSICS

## Physicists Watch As Ultracold Atoms Form A Crystal Of Quantum Tornadoes



"Now, MIT physicists have directly observed the interplay of interactions and quantum mechanics in a particular state of matter: a spinning fluid of ultracold atoms. Researchers have predicted that, in a rotating fluid, interactions will dominate and drive the particles to exhibit exotic, never-before-seen behaviors."

Source: MIT (5 January 2022)

PLASTIC

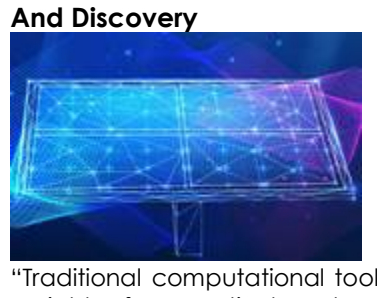
## Breakthrough In Separating Plastic Waste: Machines Can Now Distinguish 12 Different Types Of Plastic

"For the first time, we can now tell the difference between a wide range of plastic types and thereby separate plastics according to their chemical composition. This is ground-breaking and it will increase the rate of recycling of plastics immensely"

Source: Eurekalert! (5 January 2022)

SOLAR

## New Simulator To Speed Up Solar Cell Development Open-Source Tool Could Be Coupled With Neural Networks For Solar Cell Optimization And Discovery

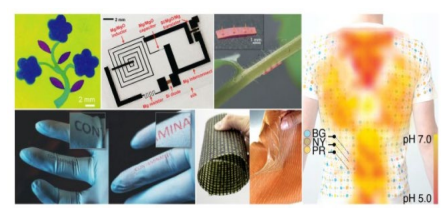


"Traditional computational tools take the variables for a particular solar cell design as input, and spit out the resulting power rating as the output.
But with the new software, "we provide output but also show how efficiency would change if we change any of the input parameters," says Giuseppe Romano, a research scientist at MIT's Institute for Soldier Nanotechnologies. "You can change input parameters continuously and see a gradient of how output changes."

Source: IEEE Spectrum (4 January 2022)

SUSTAINABLE MATERIAL

## Sustainable Silk Material for Biomedical, Optical, Food Supply Applications




"While silk is best known as a component in clothes and fabric, the material has plentiful uses, spanning biomedicine to environmental science. In Applied Physics Reviews, by AIP Publishing, researchers from Tufts University discuss the properties of silk and recent and future applications of the material."

Source: AIP (4 January 2022)

TRANSPORT

## Milan To Build Cambio Network Of "Super-Cycle Corridors" Linking 80 Per Cent Of The City

"Milan has committed itself to constructing 750 kilometres of bike paths by 2035 as part of a plan to make cycling the most convenient form of local transport…Once completed, it will place 86 per cent of Milan's population and 80 per cent of services, including hospitals, schools and businesses, within one kilometre of a bike route.."

Source: DEZEEN (10 January 2022)