SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Weekly Discovery

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9 DECEMBER 2019 - 13 DECEMBER 2019

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HealthCare	Robotics & Automation	Design & Innovation
Cybersecurity	Digital Design & Fabrication	Advanced Manufacturing

3D PRINTING

Additive Manufacturing of Ultrafine-Grained High-Strength Titanium Alloys

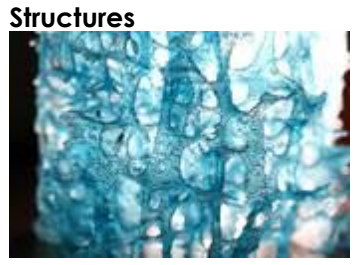
Source: Britannica ImageQuest

"Here we report on the development of titanium–copper alloys that have a high constitutional supercooling capacity as a result of partitioning of the alloying element during solidification, which can override the negative effect of a high thermal gradient in the laser-melted region during additive manufacturing."

Source: Nature (4 December 2019)

3D PRINTING

'Buildings' in Human Bone May Hold Key to Stronger 3D-Printed Lightweight Structures



"Now, the discovery of how a 'beam' in human bone material handles a lifetime's worth of wear and tear could translate to the development of 3D-printed lightweight materials that last long enough for more practical use in buildings, aircraft and other structures."

Source: Purdue University (5 December 2019)

ARCHITECTURE

How Artificial Lighting Can Improve (or Worsen) Architecture

"Of the varying aspects of architectural and interior design, lighting is one element that can visually enhance or destroy a space. This influence stems from the wide range of artificial lighting designed for the most widely differing tasks, environments, and purposes, including internal and even external spaces such as facades and landscape projects."

Source: ArchDaily (5 December 2019)

ARTIFICIAL SKIN

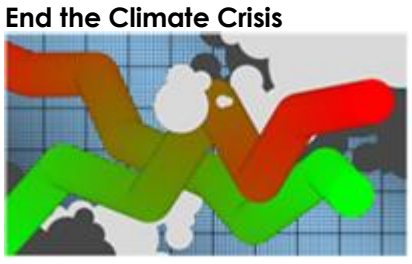
Japanese Company Creates Spray-On Artificial Skin

"A Japanese cosmetics manufacturer has developed spray-on artificial skin using fine fiber technology … the Kao Corporation envisions that the fine fiber technology could find future use cases in the medical field. For instance, the fine fiber technology might be used in wound healing, to conceal burn or post operation scars or as an invisible medical patch."

Source: Engineering360 (5 December 2019)

CLIMATE

This MIT Climate Solutions Simulator Lets You Design the Perfect Plan to End the Climate Crisis

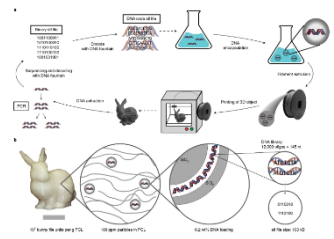


"Called En-ROADS, the simulator allows users to implement different climate policies, like a coal tax or a subsidy for renewables, by moving corresponding sliders, and then instantly see the effects those changes would have on our planet's future temperature."

Source: Fast Company (3 December 2019)

DATA STORAGE

Storing Data in Everyday Objects



Source: Nature Biotechnology

"Researchers have discovered a new method for turning nearly any object into a data storage unit. This makes it possible to save extensive data in, say, shirt buttons, water bottles or even the lenses of glasses, and then retrieve it years later."
Read more in Nature Biotechnology or view the video here.

Source: Science Daily (9 December 2019)

DEEP LEARNING

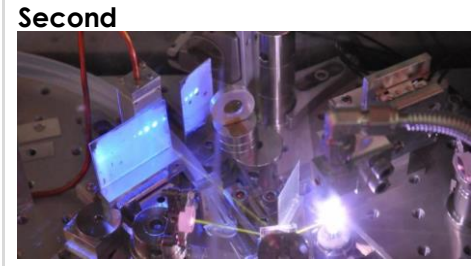
Rice, Amazon Report Breakthrough in 'Distributed Deep Learning'

"Using a divide-and-conquer approach that leverages the power of compressed sensing, computer scientists from Rice University and Amazon have shown they can slash the amount of time and computational resources it takes to train computers for product search and similar 'extreme classification problems' like speech translation and answering general questions."

Source: Rice University (9 December 2019)

IMAGING TECHNOLOGY

New Laser Technique Images Quantum World in a Trillionth of a Second



"Technique captures a process that commonly causes electrical resistance in materials while, in others, can cause the absence of resistance, or superconductivity."

Source: EurekAlert! (10 December 2019)

KNOWLEDGE MANAGEMENT

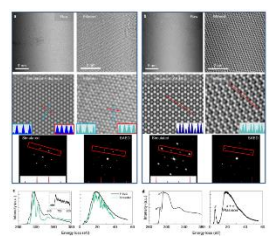
How Your Organization's Experts Can Share Their Knowledge

"As a leader, how can you make sure to not only preserve that know-how for future generations but also multiply its impact? Through something we call a knowledge cascade: the diffusion of experts' 'deep smarts' to and through multiple learners in a way that minimizes the burden on the experts."

Source: Harvard Business Review (9 December 2019)

MATERIALS SCIENCE

A Tech Jewel: Converting Graphene into Diamond Film



Source: Nature Nanotechnology

"Researchers of the Center for Multidimensional Carbon Materials (CMCM) within the Institute for Basic Science (IBS, South Korea) have reported in Nature Nanotechnology the first experimental observation of a chemically induced conversion of large-area bilayer graphene to the thinnest possible diamond-like material, under moderate pressure and temperature conditions."
Read more at Nature Nanotechnology.

Source: Science Daily (9 December 2019)

MATERIALS SCIENCE

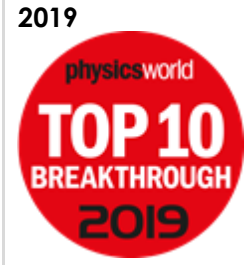
Breakthrough Made in Detecting Carbon Impurities in Gallium Nitride Crystals via Light

"Carbon impurity has long hindered efficiency in nitride-based electronic and optical devices. But Researchers at Tohoku University, have discovered a method that can quickly detect carbon impurity using light."

Source: Phys.org (9 December 2019)

PHYSICS

Physics World Announces Its Breakthrough of the Year Finalists for 2019

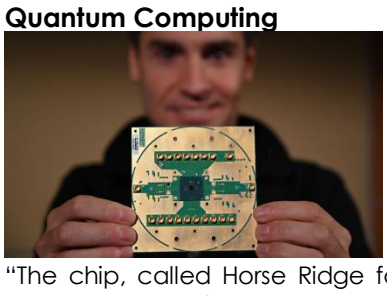


"Today, we are revealing the 10 finalists for 2019, which serves as a shortlist from which we will pick the Breakthrough of the Year."

Source: Physics World (4 December 2019)

QUANTUM COMPUTING

Intel Unveils Cryogenic Chip to Speed Quantum Computing



"The chip, called Horse Ridge for one of the coldest spots in Oregon, uses specially-designed transistors to provide microwave control signals to Intel's quantum computing chips."

Source: IEEE Spectrum (9 December 2019)

ROBOTICS

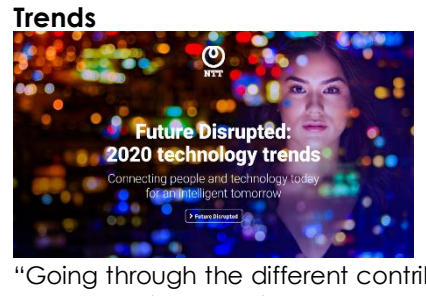
A Robot and Software Make It Easier to Create Advanced Materials

"A Rutgers-led team adapted advanced liquid handling robotics to perform the chemistry required for synthesizing synthetic polymers. This new automated approach enables the rapid exploration of new materials valuable in industry and medicine."

Source: Rutgers Today (4 December 2019)

TECHNOLOGY

Future Disrupted: 2020 Technology Trends



"Going through the different contributions to Future Disrupted, it's clear that we've never before had so much powerful technology at our disposal – technology we can use to answer questions and solve problems in our societies, businesses and communities."

Source: NTT (2019)

VIRTUAL REALITY

Virtual Reality Can Help Treat These Four Conditions

"Through research, scientists have proved that VR can create new avenues for patients suffering from various conditions."

Source: International Business Times (8 December 2019)

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