SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Weekly Discovery

We SHARE to inspire and ignite ideas!

13 - 17 March 2023

ADDITIVE MANUFACTURING

Researchers Unveil New AI-Driven Method For Improving Additive Manufacturing

"Many industries rely on metal additive manufacturing to rapidly build parts and components. Rocket engine nozzles, pistons for high performance cars, and custom orthopedic implants are all made using additive manufacturing, a process that involves building parts layer-by-layer using a 3D printer."

Source: DOE/ARGONNE NATIONAL LABORATORY (9 March 2023)

ARCHITECTURE

Placemaking In The AI Era

"For architects, one of the most captivating aspects of AI and the Metaverse is that of placemaking. How do we create compelling places that bring people to this new world and enable them to enjoy their experience there, getting them to return once the novelty has worn off? How much of this digital world needs to connect back with our day-to-day physical environs for it to feel meaningful and how do these artificial cities, towns, and neighborhoods come to life?"

Source: Arch Daily (15 March 2023)

AVIATION

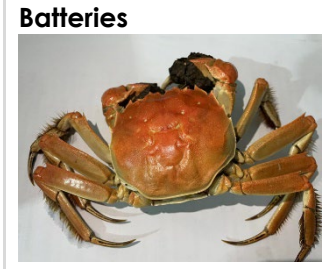
Propeller Advance Paves Way For Quiet, Efficient Electric Aviation

"researchers at Chalmers University of Technology, Sweden, have developed a propeller design optimisation method that paves the way for quiet, efficient electric aviation."

Source: Eurekalert! (14 March 2023)

BATTERIES

Crab Shells Could Help Power The Next Generation Of Rechargeable Batteries



"a team reporting in ACS Omega has used this "crab carbon" to create anode materials for sodium-ion batteries — an up-and-coming competitor to lithium-ion chemistries."

Source: Eurekalert! (13 March 2023)

ENERGY

Future cargo ships could be powered by wind to fight climate change

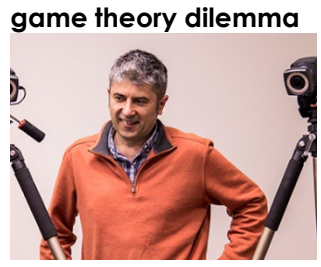
"Scientists from the University of Southampton have received funding from Innovate UK to investigate the potential of the technology as part of efforts to decarbonise the UK's maritime sector.

The research team intends to create new software tools which accurately predicts how modern vessels perform on the ocean when fitted with the FastRig wing-sails, developed by UK company Smart Green Shipping."

Source: Eurekalert! (14 March 2023)

GAME THEORY

Researcher solves nearly 60-year-old game theory dilemma

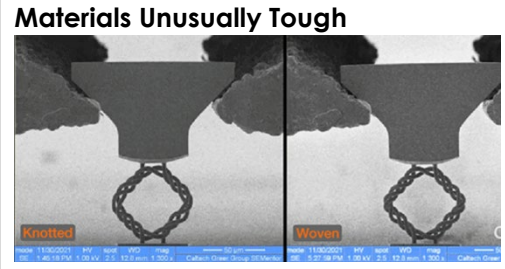


"To understand how driverless vehicles can navigate the complexities of the road, researchers often use game theory — mathematical models representing the way rational agents behave strategically to meet their goals."

Source: UCSC (14 March 2023)

MATERIALS

Knots Smaller Than Human Hair Make Materials Unusually Tough



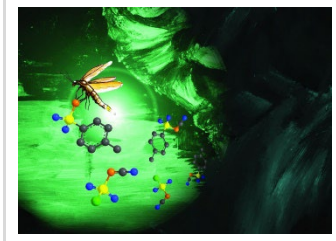
"In the latest advance in nano- and micro-architected materials, engineers at Caltech have developed a new material made from numerous interconnected microscale knots.

The knots make the material far tougher than identically structured but unknotted materials: they absorb more energy and are able to deform more while still being able to return to their original shape undamaged. These new knotted materials may find applications in biomedicine as well as in aerospace applications due to their durability, possible biocompatibility, and extreme deformability."

Source: CALIFORNIA INSTITUTE OF TECHNOLOGY (9 March 2023)

MATERIALS

Researchers Find Access To New Fluorescent Materials



"Nils König and his colleagues demonstrated a new reaction on AIE-based phospholes, which provided access to a new class of substances. Phospholes can be modified under mild conditions by isocyanates, a reactive class of substances consisting of the elements nitrogen, oxygen and carbon, which are inexpensive and widely available due to their industrial applications in the field of polymers and biochemistry. This reaction, which seems to contradict classical organic chemistry, is characterised by high yields and excellent atom economy."

Source: Eurekalert! (10 March 2023)

PERFORMANCE

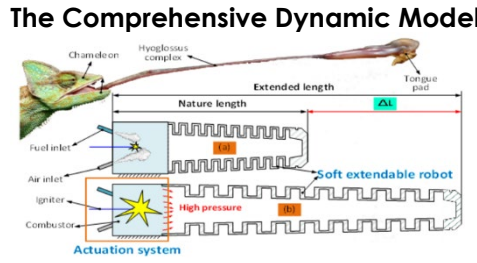
The Future Of Live Performance Is Already Here

"The artists came together in February for what may well have been the world's first synchronized live orchestral performance. Spanning two locations on two continents (at the Peter Jay Sharp Theater on the Juilliard School's iconic Manhattan campus, and at its counterpart in China, which opened in 2020), the musicians performed the same musical piece simultaneously, and without a conductor."

Source: FAST COMPANY (13 March 2023)

ROBOTICS

Design Of A Fuel Explosion-Based Chameleon-Like Soft Robot Aided By The Comprehensive Dynamic Model



"A research paper by scientists at the Beijing Institute of Technology and University of Lancaster displayed a recent advancement of using fuel explosion as the power of source to achieve the rapid and powerful motion for the medium-size robots."

Source: Eurekalert! (11 March 2023)

SOFT ROBOTICS

Carnegie Mellon University researchers develop soft robot that shifts from land to sea with ease

"The bistable actuator is made of 3D-printed soft rubber containing shape-memory alloy springs that react to electrical currents by contracting, which causes the actuator to bend. The team used this bistable motion to change the actuator or robot's shape. Once the robot changes shape, it is stable until another electrical charge morphs it back to its previous configuration."

Source: CARNEGIE MELLON UNIVERSITY (14 March 2023)

SUSTAINABILITY

Scientists enhance recyclability of waste plastic

"Scientists at the U.S. Department of Energy's (DOE) Institute for Cooperative Upcycling of Plastics (iCOUP) have developed a new method for recycling HDPE. Using a novel catalytic approach, iCOUP scientists from DOE's Argonne National Laboratory and Cornell University transformed waste HDPE plastic into a new material that can be recycled repeatedly without loss of quality."

Source: DOE/ARGONNE NATIONAL LABORATORY (14 March 2023)