



Tech Insider Stories 27 January 2023

Story 1: A new satellite can now measure nearly all the Earth's water

Source: CNN Story by Ashley Strickland

Link: <https://www.cnn.com/2022/12/16/world/nasa-swot-launch-scn/index.html>



- Last month an innovative satellite created through a joint effort between NASA and the French space agency was launched into orbit.
- Using cutting-edge radar technology, the International Surface Water and Ocean Topography Mission satellite will survey water on more than 90% of the world's surface every 21 days measuring the height of water in freshwater bodies and the oceans.
- The goal is to show how oceans influence climate change as well as how global warming is impacting lakes, rivers, and reservoirs.
- The satellite's surveying will help scientists understand the global water budget and see how the heat exchange between the Earth's atmosphere and bodies of water may be accelerating global warming.

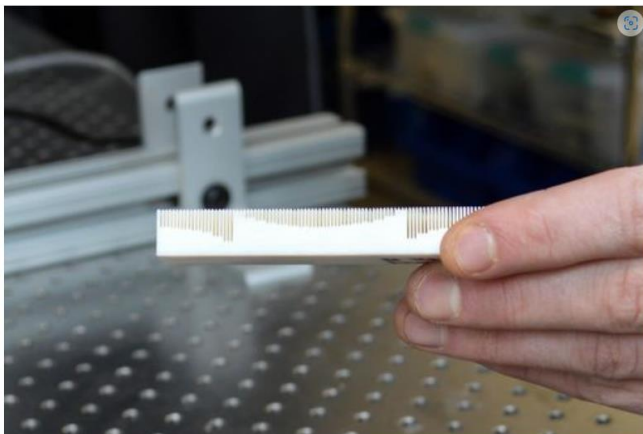
- And the satellite's data will also help national, state, and local government agencies better prepare for flooding and other water-related disasters [such as what we just witnessed in California]

Story 2: University of Minnesota researchers can move objects without touching them

Source: Scitechdaily.com and University of Minnesota announcement

Link: <https://scitechdaily.com/not-science-fiction-a-new-method-to-move-objects-without-contact/>

See video here: <https://www.youtube.com/watch?v=61y6CBfyogI&t=1s>



By placing a metamaterial pattern on the surface of an object, the University of Minnesota researchers were able to use sound to steer it in a certain direction without physically touching it. Credit: Olivia Hultgren

- A team of researchers at the University of Minnesota Twin Cities has discovered a way to move and manipulate objects [larger than ever before] using only ultrasound waves.
- We can't hear Ultrasound waves because they have higher frequencies than the human ear can hear.
- This is not the first-time sound waves have been used to move objects.
 - It's been demonstrated before that sound waves can move and manipulate objects, but the objects in previous experiments have been tiny [only a few millimeters in size].

- The University team developed a method using ultrasound waves that can move much larger objects –
 - In their experiment video they manipulate an object about the size of a large pack of chewing gum.
 - Okay, that’s still a small object, but future advancements may significantly increase the size.
- To make this possible the team is using some very geeky science dealing with the physics of metamaterials, which are materials that are engineered and designed to interact with light or sound waves.
- By placing a metamaterial pattern on the surface of an object, the researchers were able to use ultrasound waves to steer and move objects in a controlled direction without physically touching them.
- The University of Minnesota team says their research will help pave the way for contactless movement of objects in manufacturing, robotics, and much more!

Story 3: The viability of solar cars just got a shot in the arm with an order for 10,000 vehicles made by a Dutch car maker

Source: NL#Times Netherlands Times

Link: <https://nltimes.nl/2023/01/17/dutch-startup-lightyear-pre-sells-10000-solar-electric-cars-company-leases>



Lightyear 2, the second production model of the electric car manufacturer Lightyear - Credit: Lightyear / Lightyear 2, the second production model of the electric car manufacturer Lightyear - License: All Rights Reserved

- What if your all-electric car's roof and body were covered with mini solar panels harvesting electricity whenever they're exposed to sunlight to augment the electricity pumped into the vehicle's batteries using a traditional charging port.
- That's the idea behind "solar cars" – which can add around 15 to 45 miles of range on a clear day.
- Proof of the growing commercial market interest in solar cars happened this month when Dutch car maker Lightyear inked a deal with a car leasing company called Arval to produce 10,000 units of its solar Lightyear 2 model.
- The key to Lightyear's success to date has been their ability to produce a solar car for less than 40,000 euros [that's about 43,000 US dollars].
- Lightyear is not the only company developing solar cars.
 - Toyota, for example, has a car with solar panels on the roof.
- MARK, I think this is a really interesting trend to track, and I'm hoping to see solar cars at the big international car show here in Portland next month.

Story 4: Scientists recently discovered a fourth membrane in the human brain and the important role it plays

Source: Popular Mechanics

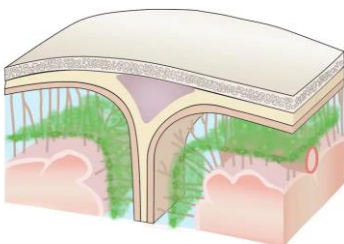
Story by Tim Newcomb

Link: <https://www.popularmechanics.com/science/health/a42436251/fourth-membrane-discovered-in-human-brain/>

Source: newscientist.com

Story by Clare Wilson

Link: <https://www.newscientist.com/article/2353622-weve-just-discovered-a-new-part-of-the-brains-waste-disposal-system/>



A cross-section of the skull (top) and the outer layer of the brain, showing the subarachnoid lymphatic-like membrane in green.
University of Copenhagen

- Recently scientists at the universities of Rochester and Copenhagen discovered there's a fourth previously unknown membrane in the brain.
- Until this breakthrough scientists thought there were only three layers of membranes that protect the brain and spinal cord.
 - The newly discovered fourth membrane is just below what was considered the middle layer called the arachnoid layer.
 - The team's findings reveal that this newly found fourth layer helps control the flow of cerebrospinal fluid [which cushions the brain and spinal cord].
 - And this newly discovered fourth layer is also believed to help remove waste from the brain to support immune defense.
- The researchers were able to see the thin and delicate fourth membrane [which measures only a few cells in thickness] thanks to recent advancements in neuro-imaging and molecular biology.
- And here's why this is so important - The Rochester and Copenhagen team hopes this discovery may lead to improved drug delivery, new biological therapies, and a greater understanding of diseases of the brain.