



Tech Insider Stories 3 February 2023

Story 1: Scientists create a small shapeshifting humanoid robot that can liquefy and reform

Source: Sciencealert.com

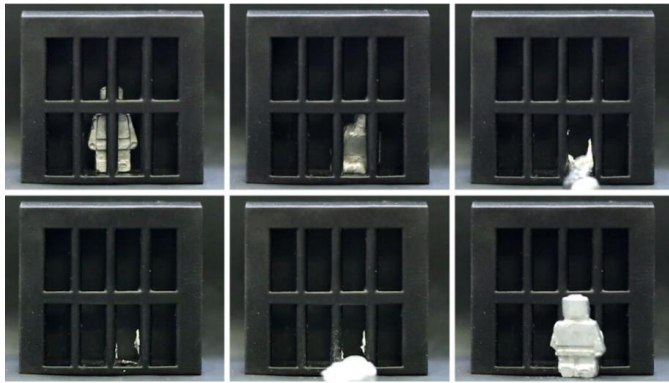
Story by Michelle Starr

Link: <https://www.sciencealert.com/scientists-create-shapeshifting-humanoid-robot-that-can-liquefy-and-reform>

Source: Sciencenews.org

Story by McKenzie Prillaman

Link: <https://www.sciencenews.org/article/robot-shape-shifting-gallium-melt-reform-magnetic-fields>



This Lego-like figurine escaped from prison Terminator 2-style thanks to a new composite of gallium and magnetic particles, which liquefies in the presence of a changing magnetic field and moves under the guidance of a permanent magnet.
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See video here: <https://www.youtube.com/watch?v=L9zE8JQCG5E>



Source for image: <https://www.geologyin.com/2018/02/gallium-is-metal-that-melts-in-your.html>

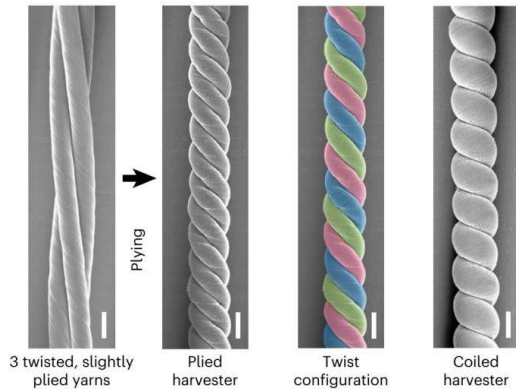
- Scientists at the University of Hong Kong have created a small shapeshifting robot that can switch between liquid and solid metal states!
 - And believe me, this has the robotics world buzzing!
- Here's a snapshot on the technology behind this innovation and what it can do:
- The researchers used a non-toxic material called gallium, which is a soft metal that has a melting point so low it can melt in your hand!
- The scientists created a new composite of gallium and magnetic particles, which liquefies in the presence of a changing magnetic field and moves under the guidance of a permanent magnet.
- In tests the University of Hong Kong team made their little robot:
 - climb over obstacles,
 - escape a cage [and there's a really freaky video showing this],
 - and even split up to perform cooperative tasks moving objects around before recombining and resolidifying.
- Okay, reality check - this technology is at a very early proof-of-concept stage, but the potential real-world applications could be very interesting – perhaps to manipulate objects in difficult to reach spaces.



Story 2: Researchers create a new type of yarn that turns movement into electricity

Source: Techxplore.com News release from University of Texas at Dallas

Link: <https://techxplore.com/news/2023-01-demo-carbon-nanotube-yarn-harvests.html>



- Recently Nanotechnology researchers at the University of Texas at Dallas announced the latest generation of their innovative carbon nanotube yarns they call “twistrans” which generate electricity when stretched or twisted.
- This is not the first electricity generating fabric technology.
- But these new carbon nanotube yarns [which look, feel, and act like traditional wool or cotton yarns] convert movement into electricity more effectively than any fabric-based energy generators developed to date.
- In one experiment the team sewed the carbon nanotube yarns into a cotton fabric patch that was then wrapped around a person's elbow.
 - Electrical signals were generated as the person repeatedly bent their elbow.
- In another experiment the carbon nanotube yarns were repeatedly stretched to generate enough electricity to power:
 - five small light-emitting diodes,
 - a digital watch,
 - and a digital humidity and temperature sensor.

Story 3: New all-in-one system can capture carbon dioxide emissions from industrial plants and convert it into a lucrative product

Source: Pacific Northwest National Laboratory website

Link: <https://www.pnnl.gov/news-media/scientists-unveil-least-costly-carbon-capture-system-date>



A scientist at Pacific Northwest National Laboratory looking at the carbon capture system technology. Photo courtesy Andrea Starr at Pacific Northwest National Lab.
Photo courtesy Andrea Starr at Pacific Northwest National Lab.

- Globally, carbon dioxide emissions from industrial plants are responsible for an estimated 31 percent of total greenhouse gas emissions.
- To help combat this there are two-step capture and recycling solutions currently being deployed.
 - The first step involves equipment to capture CO₂ emissions at the plant site.
 - The second step involves transporting the captured CO₂ to a processing facility where it can be transformed into useful products including:
 - ingredients for fuel,
 - plastics
 - and even food – as well as valuable chemicals such as methanol.
- Today's two-step solutions represent a positive step forward, but what if you could have a single, onsite system combining capture and conversion to cut out the time and expense of transporting captured CO₂ offsite?
- Scientists at the Pacific Northwest National Laboratory in Richland, Washington recently achieved this breakthrough by creating an affordable all-in-one carbon capture and conversion system.
- Here's how it works:
- The system can take, for example, exhaust flu gas from an industrial plant and strip out CO₂ using a patented solvent developed by the Lab.

- The solvent then feeds the CO₂ to the system's built-in reactor where it's converted into methanol - one of the most widely used industrial chemicals on Earth.
- I think this is a real gamechanger, as this all-in-one solution is the least expensive option today, and plant operators can sell the methanol to help cover the cost of the system and its operation.

Story 4: New portable, electronic biosensor can help detect oral cancer

Source: Medgadget.com

Story by Conn Hastings

Link: <https://www.medgadget.com/2023/01/point-of-care-biosensor-to-detect-oral-cancer.html>



- Oral cancer detection typically involves a biopsy, which is invasive, expensive and takes several weeks to obtain results.
- To help speed early detection of oral cancer, researchers at the University of Florida have created a small portable electronic biosensor that can rapidly detect a known biomarker for oral cancer.
- The device uses test strips, like those used in blood glucose tests, to spot a protein biomarker that can reveal the presence of oral cancer.
- The device processes a patient's liquid sample that is placed on the end of a test strip.

- The test strip then runs into channels within the biosensor device that contain antibody-covered electrodes which provide a readout alert if the protein biomarker indicating oral cancer is present.
- And here's why this is so important - The new portable system could be useful in rural and remote regions where access to expensive conventional lab testing equipment is not available.