

Weekly Update

1. Mathematician Reveals 'Equals' Has More Than One Meaning in Math

Canonical Isomorphism in mathematics! A set like $\{1, 2, 3\}$ can be considered "equal" to a set like $\{a, b, c\}$; this is because of the existence of an implicit understanding called traditional isomorphism, which compares similarities between the structures of groups. The mismatch between mathematicians and machines should force mathematicians to reconsider what they really mean by basic mathematical concepts like "equality" in a way that computers can understand.

Source: Science Alert

<https://www.sciencealert.com/mathematician-reveals-equals-has-more-than-one-meaning-in-math>

2. Study Suggests Melatonin Can Reduce Aging-Related Vision Loss

The human retina contains light-sensitive cells that send messages to the brain. The macula, which is the central part of the retina, enables us to see objects directly in front of us. Melatonin supplementation may prevent an age-related eye disease called macular degeneration, the most common cause of vision loss in people over 50.

Source: Insidehook

<https://www.insidehook.com/longevity/study-melatonin-reduces-vision-loss-aging>

3. Personalized brain circuit scores identify clinically distinct biotypes in depression and anxiety

Talk therapy works better for people who have greater activity in the parts of the brain associated with depression and problem solving. Machine learning has classified people with depression and anxiety into six types, based on specific brain pathways that are overactive or underactive relative to each other and to control group participants.

Source: nature medicine

<https://www.nature.com/articles/s41591-024-03057-9>

4. UH scientists discover massive energy imbalance on Saturn

Saturn is very different from Earth. Earth's orbit is more circular, so we don't experience the same extreme contrast. What was discovered was actually different than anyone expected for the gas giants. Upon closer examination, the researchers found that the problem has to do with Saturn's distance from the sun at any given time.

Source: University of Houston

<https://www.uh.edu/news-events/stories/2024/june/06182024-saturn-energy-imbalance.php>

5. Another 'alien' monolith appears, this time atop a remote desert mountain

Photos accompanying the organization's post show a strange structure standing out against the clear blue sky above the Las Vegas Valley. The image is reminiscent of a moment from Stanley Kubrick's film "2001: A Space Odyssey." The United States Wildlife Service is concerned that similar damage could occur at the Desert National Wildlife Refuge, which was created to protect a species of sheep and is home to rare plants.

Source: [The Sydney Morning Herald](https://www.smh.com.au/world/north-america/another-alien-monolith-appears-this-time-atop-a-remote-desert-mountain-20240619-p5jn44.html?ref=rss&utm_medium=rss&utm_source=rss_feed)

https://www.smh.com.au/world/north-america/another-alien-monolith-appears-this-time-atop-a-remote-desert-mountain-20240619-p5jn44.html?ref=rss&utm_medium=rss&utm_source=rss_feed

6. A jumping terrestrial leech from Madagascar

Many other worm-like invertebrates can jump, including the legless larvae of gall flies (Asphondylia species), which are in a coiled stage before they fly into the air, the larvae of Mediterranean fruit flies (Ceratitis capitata), and many insects, including Lymantria monacha and Orgyia leucostigma, can exhibit similar movements.

Source: [WILEY Online Library](https://onlinelibrary.wiley.com/doi/10.1111/btp.13340)

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7. FACE OF THE PAST Is this the face of the world's FIRST MAN? Scientists reveal 'strong & serene' likeness of human from 300,000 years ago

This skull, discovered in Morocco, significantly changed the story of the evolution of members of our species. Recently, experts in Brazil have succeeded in reconstructing the face of a 300,000-year-old human skull, which in 2017 was determined to belong to the oldest member of our ancestors, the wise man or Homo sapiens.

Source: [The Sun](https://www.thesun.co.uk/tech/28591027/face-of-worlds-first-man-likeness-of-human/)

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8. X-ray vision chip gives phones 'Superman' power to view objects through walls

The experimental chip contains an array of three sensor pixels that send and receive high-frequency radio waves in the millimeter wave (mmWave) band of the electromagnetic spectrum. Phones equipped with this chip may be able to detect the contents of envelopes or packages, or be used to find screws, wires or broken pipes in walls.

Source: [Live Science](https://www.livescience.com/technology/electronics/x-ray-vision-chip-gives-phones-superman-power-to-view-objects-through-walls)

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9. Hot Air Rises, So Why Is It Colder On Mountaintops?

The effect of this interaction is evident on windless sunny days; when birds of prey or glider pilots can soar for hours without expending much energy. Another decisive factor here is the air reaching the "tropopause" layer, the middle boundary layer between the troposphere and the stratosphere.

Source: [IFLScience](https://www.iflscience.com/hot-air-rises-so-why-is-it-colder-on-mountaintops-74671)

<https://www.iflscience.com/hot-air-rises-so-why-is-it-colder-on-mountaintops-74671>

10. 3,300-year-old shipwreck wows Israeli archaeologists

Exploration by a natural gas company on the eastern Mediterranean sea floor has led to the discovery of the oldest deep-sea shipwreck. The Israel Antiquities Authority stressed that the discovery of the shipwreck, dating from the 13th to 14th centuries BC, proves that Bronze Age sailors were able to navigate the seas without sight, contrary to previously believed.

Source: **Cosmic Log**

<https://cosmiclog.com/2024/06/20/3300-year-old-shipwreck-wows-israeli-archaeologists/>