



SPARC WEEKLY



EARTH MAY BE GAINING A TEMPORARY MOON

Earth is set to play host to a visiting “mini-moon.”



Starting in late September, Earth is going to have a second moon for two brief months, as a small asteroid piece will be incorporated into the planet's orbit before heading back into outer space.

Experts often monitor objects flying near Earth for potential threats; but they are also of great interest to scientists, since these space particles could become a valuable resource in the future.

Earth's gravity is going to temporarily capture an asteroid named **2024 PT5**. The mini-moon will orbit the Earth from September 29 to November 25,

according to a study published in the journal *Research Notes of the American Astronomical Society*. The asteroid is approximately 10 meters wide and was discovered in August through NASA's Asteroid Terrestrial-impact Last Alert System.

Scientists are often monitoring near-earth objects for two major reasons: resources and planetary defense. Mini-moons like 2024 PT5 are also of great intrigue as they may contain precious metals, which one day might be mined. In terms of defense, researchers are always on the lookout for large asteroids capable of colliding with Earth.

<https://theweek.com/science/temporary-moon-earth-orbit>

<https://futurism.com/the-byte/earth-new-moon>

<https://theskylive.com/2024pt5-info>

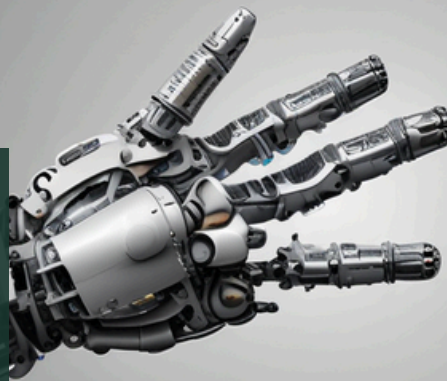
<https://www.scientificamerican.com/article/tiny-asteroid-will-briefly-become-earths-mini-moon/>



The space rock is expected to make another slightly more distant flyby of the Earth in January — and once again in 2055.

ROBOTICS MIGHT SOMEDAY GIVE US AN EXTRA HAND

It's a third arm that you would control with the movements of your diaphragm



Below the lungs is a muscle called the diaphragm (DY-uh-fram). When it contracts, it pulls air into the lungs. As it relaxes, the lungs expel air. The new robotic limb is attached to an elastic belt around a user's chest. A sensor on the belt tracks how the diaphragm moves. Electronics in the sensor then talk to the robotic arm.

Have you ever struggled with a task because having two arms just wasn't enough? If so, you might appreciate a new device that could lend a helping hand — literally. You strap on this robotic arm, then control it with the muscle you use to breathe. Right now, the robotic arm is worn in the middle of your chest. But it could go above your shoulders or at your side.

Inhaling deeply tells the robotic arm to extend. Exhaling deeply directs it to retract. Breathing normally keeps the arm at its current position. The early tests showed people could look around and talk while using a bonus arm. But it's not yet completely clear how well people can control two natural arms plus a robotic one.

<https://www.science.org/doi/10.1126/scirobotics.adh1438>

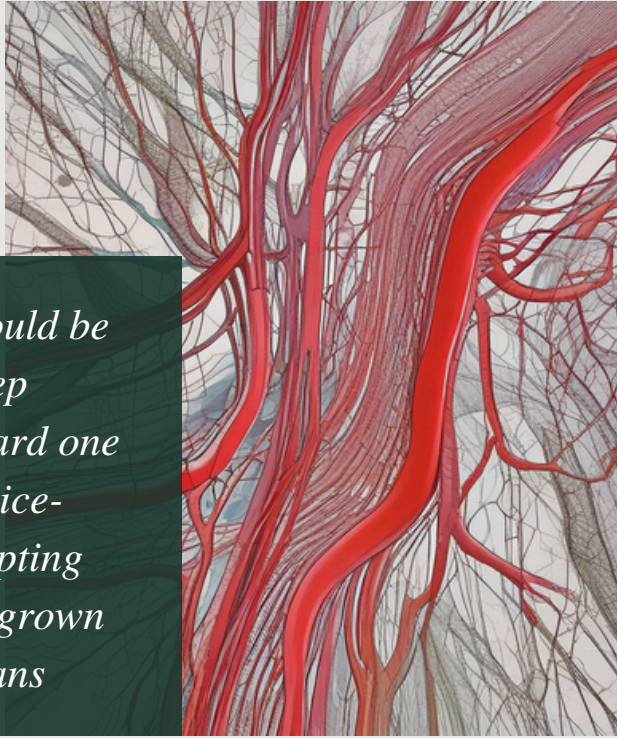
<https://www.snexplores.org/article/robotic-arm-gives-extra-hand>

It all depends on “what you want to do with it,” says engineer Giulia Dominijanni. She was part of a team at the Swiss Federal Institute of Technology in Lausanne, or EPFL, that built the device. With the new device, the challenge was to create a bonus limb that someone could control while still using both of their real arms.



A virtual helping hand

Robotic limbs could be useful as prosthetic devices to aid disabled people or those recovering from accidents or strokes.



It could be a step toward one day ice-sculpting lab-grown organs

Superhighways of vessels beneath our skin transport blood and nutrients. These natural pathways branch out like tree limbs to help our body move food and oxygen to our organs. Our bodies make vessels naturally, but bioengineers also want to make them artificially. And now a team of engineers has found a cool new way to do that in the lab: They use ice.

The idea was actually inspired by the ice magic in a Disney movie, says Burak Ozdoganlar. He's a mechanical engineer who's leading the new vessel-building project at Carnegie Mellon University. "Frozen was what gave us the idea that we can make amazing shapes [using ice]," he explains.

To make the vessels, engineers program its shape into a 3-D printer. The printer then drops water onto a very cold surface, where it freezes instantly.

THE MOVIE FROZEN INSPIRED THE ICY, 3-D PRINTING OF BLOOD VESSELS

How cold? Try -35° Celsius. The printer repeats this process until the vessel's shape is complete. In all, it takes less than 30 seconds. This icy vessel template is then encased in gelatin. Shining ultraviolet light on the gelatin hardens it as the ice melts away. What's left are realistic-looking channels for blood to move through.

Blood vessels are very delicate and have been hard to make outside the body. If the new method works, it could help support lab-made organs or ways to test new medicines. One day, artificial vessels might even replace damaged ones in people with cardiovascular disease.

<https://www.snexplores.org/article/innovation-2024-frozen-movie-inspired-ice-3d-printing-blood-vessels>

<https://doi.org/10.1002/advs.202201566>

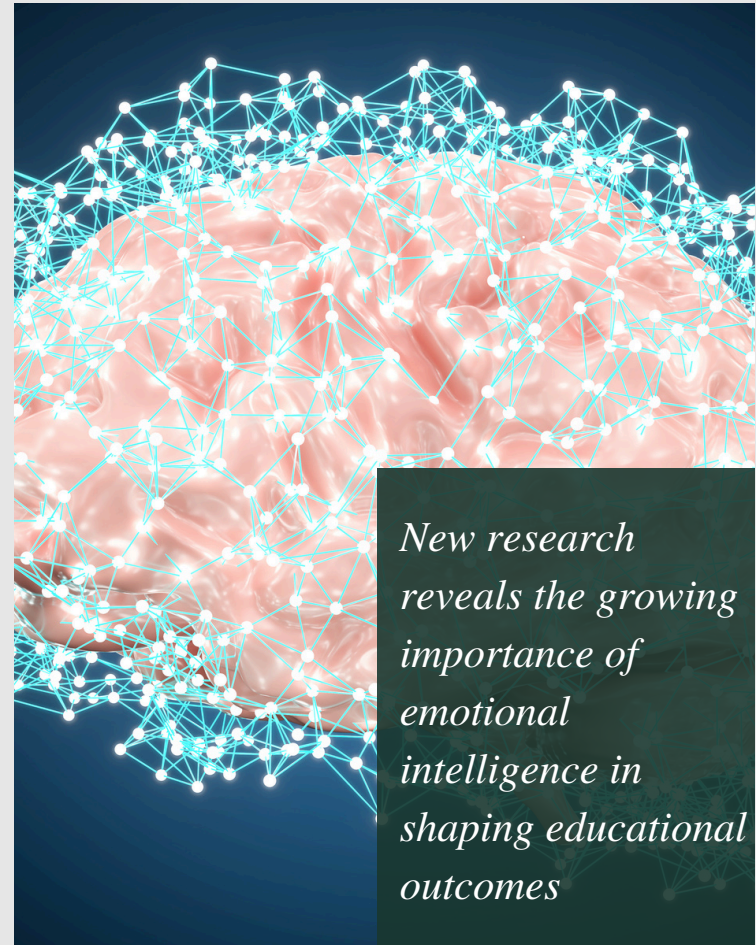


NON-COGNITIVE SKILLS: THE HIDDEN KEY TO ACADEMIC SUCCESS

A new Nature Human Behaviour study, jointly led by Dr Margherita Malanchini at Queen Mary University of London and Dr Andrea Allegrini at University College London, revealed that non-cognitive skills, such as motivation and self-regulation, are as important as intelligence in determining academic success. These skills become increasingly influential throughout a child's education, with genetic factors playing a significant role. The findings suggest that fostering non-cognitive skills alongside cognitive abilities could significantly improve educational outcomes.

<https://www.nature.com/articles/s41562-024-01967-9>

<https://www.sciencedaily.com/releases/2024/08/240826131236.htm>



Twin and polygenic scores analyses found that the links between non-cognitive genetics and academic achievement became stronger over the school years. The results from within-family analyses indicated that non-cognitive genetic effects on academic achievement could not simply be attributed to confounding by environmental differences between nuclear families, consistent with a possible role for evocative/active gene–environment correlations. By studying genetic associations through a developmental lens, we provide further insights into the role of non-cognitive skills in academic development.



WHO ARE WE?

SPARC Robotics Team's mission and vision is to make our environment the best it can be. On a volunteer basis, we look at the problems that are happening around us and make them our problems, both as SPARC and individually, and help as much as we can with appropriate projects. NASA ACCP (Astro Camp Community Partners) was only in the US until four years ago. This year they came to Turkey with us after four years of traveling to many countries. ACCP educates school-age children from kindergarten to high school on science-related topics of interest with practical knowledge and application, while also supporting children's craft development, general culture and questioning skills. As SPARC, we have brought this training provided by NASA to our country in the most comprehensive way and our continuous communication with NASA not only enables us to improve our trainings day by day, but also gives us the opportunity to learn about the innovations in the field of STEM instantly, from the most accurate source and to spread the knowledge we have around us.



EDITOR

Hello, I'm Defne and I'll be the editor of this newsletter. I'll have a partner for future news but for now we'll be together. I hope you find it useful and I hope it has helped you to keep your mind out of your problems while reading it. Have a good week. See you next week!!