

Best of Last Week—gravity free technology, recreating the Holodeck, why the moon is lopsided

April 15 2024, by Bob Yirka

Schematic illustration with a gravity gradient map (blue hexagonal pattern) of the

lunar nearside and a cross-section showing two ilmenite-bearing cumulate downwellings from lunar mantle overturn. Credit: Adrien Broquet/University of Arizona & Audrey Lasbordes

It was a good week for physics research as a team at the Quantum Machines Unit at the Okinawa Institute of Science and Technology developed a new material with the potential to [unlock gravity-free technology](#). Their device is a floating platform in a vacuum that involves the use of magnets and graphite. Also, a team of physicists working on the BESIII collaboration observed an anomalous line shape around the $p\bar{p}$ mass threshold in the $J/\psi \rightarrow \gamma 3(\pi^+\pi^-)$ decay, representing evidence of [a new subatomic particle](#). And a team at the University of California, Riverside, solved a puzzle regarding [an ancient galaxy](#) found by the Webb telescope—the galaxy JWST-ER1g acts as a lens, bending light from a faraway source, resulting in the observed ring.

In technology news, a team of engineers at the University of Florida demonstrated a [new 3D-printing method](#) that could make printing objects more affordable and eco-friendly. And a team at the University of Pennsylvania recreated [Star Trek's holodeck](#) using ChatGPT and video game assets—called Holodeck, the system generates interactive virtual 3D environments. A team of solar energy engineers at Lehigh University developed [a new quantum material](#) that promises up to 190% quantum efficiency in solar cells. And a team at Osaka Metropolitan University developed a process that could bring all-solid-state sodium batteries [closer to practical use](#).

In other news, a team of medical researchers at the University of Georgia Center for Food Safety in the College of Agricultural and

Environmental Sciences found evidence that drinking [certain types of teas](#) could help the immune system fight off COVID-19—the ingredients of some teas were found to inactivate the SARS-CoV-2 virus in saliva up to 99.9%. Also, a team of researchers at the University of Arizona solved a longstanding mystery surrounding the [lopsided nature of the moon's geology](#). After the moon literally turned itself inside out, ilmenite materials migrated to its near side and sank into the interior in sheet-like cascades, leaving behind remains that caused anomalies in the moon's gravity field.

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Citation: Best of Last Week—gravity free technology, recreating the Holodeck, why the moon is lopsided (2024, April 15) retrieved 9 May 2024 from <https://sciencex.com/news/2024-04-week-gravity-free-technology-recreating.html>

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