



April 2022

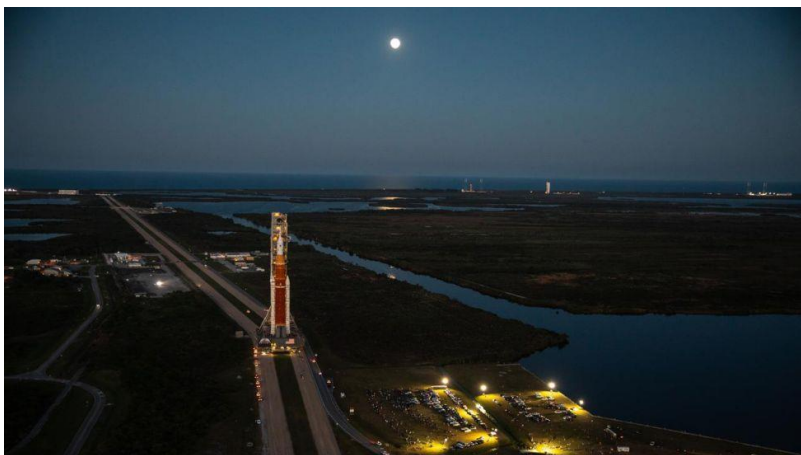
Update

**Oklahoma Space
Alliance**

A Chapter of The
National Space Society

A free email newsletter of the Oklahoma Space Alliance

SLS Rollout by Moonlight



April 2022 OSA Meeting

Saturday, April 9, 2022

2:00 PM

**Cliff & Claire McMurray's
House**

2715 Aspen Circle, Norman, OK 73072

405-863-6173

Program— Space News and
Events

Website: <http://osa.nss.org>



Quote of the Month

"It's the most beautiful thing I've ever seen." – Blue Origin passenger Sharon Hagle

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Oklahoma Space Alliance

Update

April 9, 2022

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The *Oklahoma Space Alliance Update* is a bi-monthly newsletter of the Oklahoma Space Alliance a chapter of the National Space Society, a non-profit organization headquartered in Washington, D.C. The address of OSA is **102 W. Linn, #1, Norman, OK 73071.**

Unless otherwise noted, all contents of articles herein do not necessarily reflect the opinion of anyone but the writer. Reprint rights are granted to recognized chapters of **NSS**, provided credit is given.

Articles may be submitted by U.S. mail or electronically. Articles may be sent to the Editor at 121 South Creekdale Drive, Norman, OK 73072 or to david.sheely51@gmail.com. Each submission should include the author's name and either e-mail address or phone number (for verification only). A text or Microsoft Word file is preferred. Please contact the Editor by phone, e-mail or texting before mailing your information.

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Well, They Brought Him Back



On March 30, Mark Vande Hei landed on the Kazakhstan steppe with his Expedition 66 colleagues cosmonauts Pyotr Dubrov and Anton Shkaplerov. With his ISS stay of 355 days, he has now spent more time on a single space mission than any other U.S. astronaut in history.

Articles <https://spacenews.com/soyuz-returns-astronaut-and-cosmonauts-from-space-station/>

<https://www.space.com/nasa-astronaut-mark-vande-hei-lands-earth-misses-wife>

<https://www.space.com/soyuz-ms19-record-setting-astronaut-cosmonauts-landing>

It's Getting to Be Routine (We Hope)

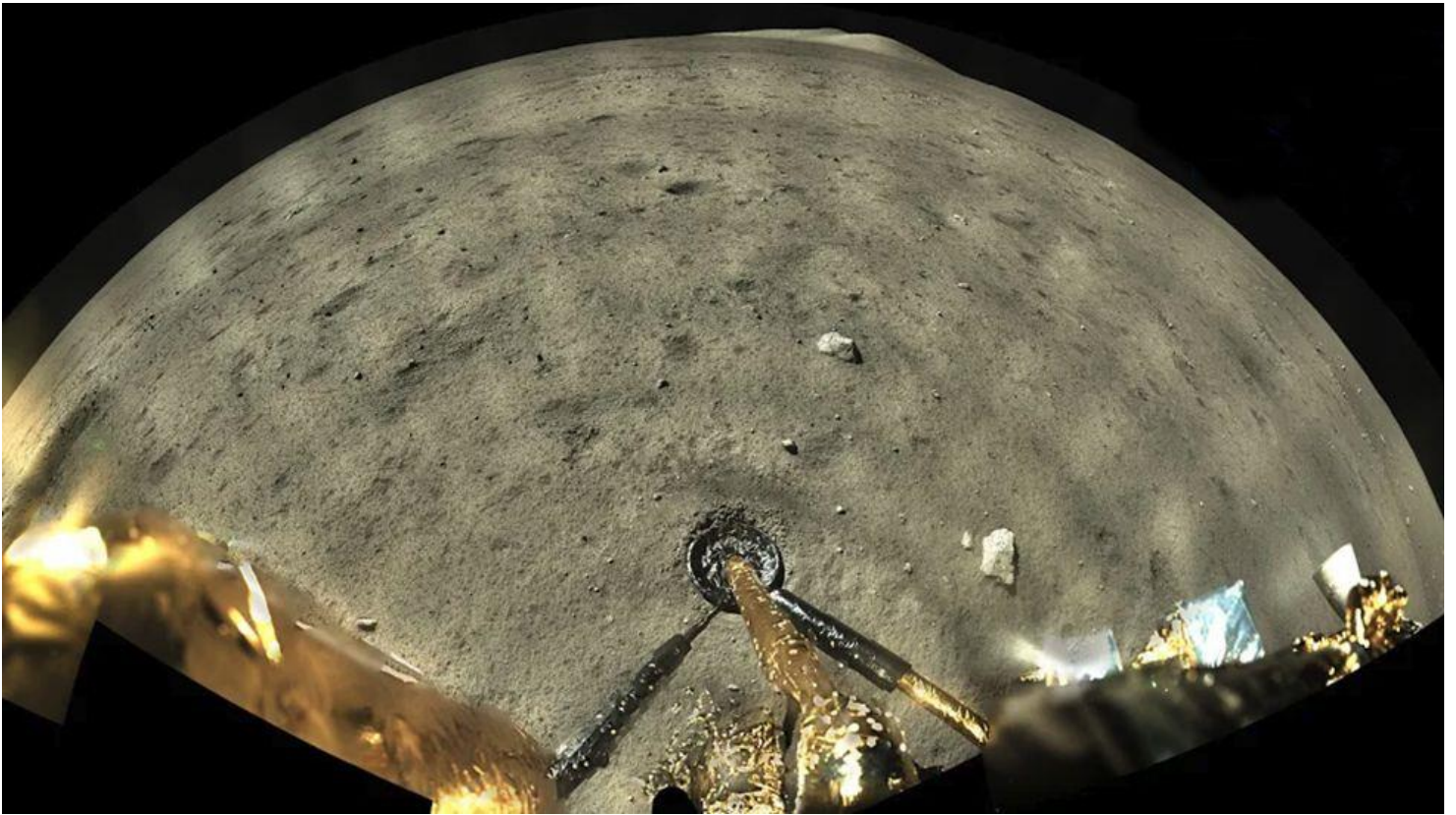


Blue Origin flew six more paying customers to space on March 31. This was the first crew that didn't include a celebrity passenger.

Articles: <https://spacenews.com/blue-origin-flies-six-on-first-new-shepard-suborbital-flight-of-2022/>

<https://www.space.com/blue-origin-space-tourism-launch-ns-20>

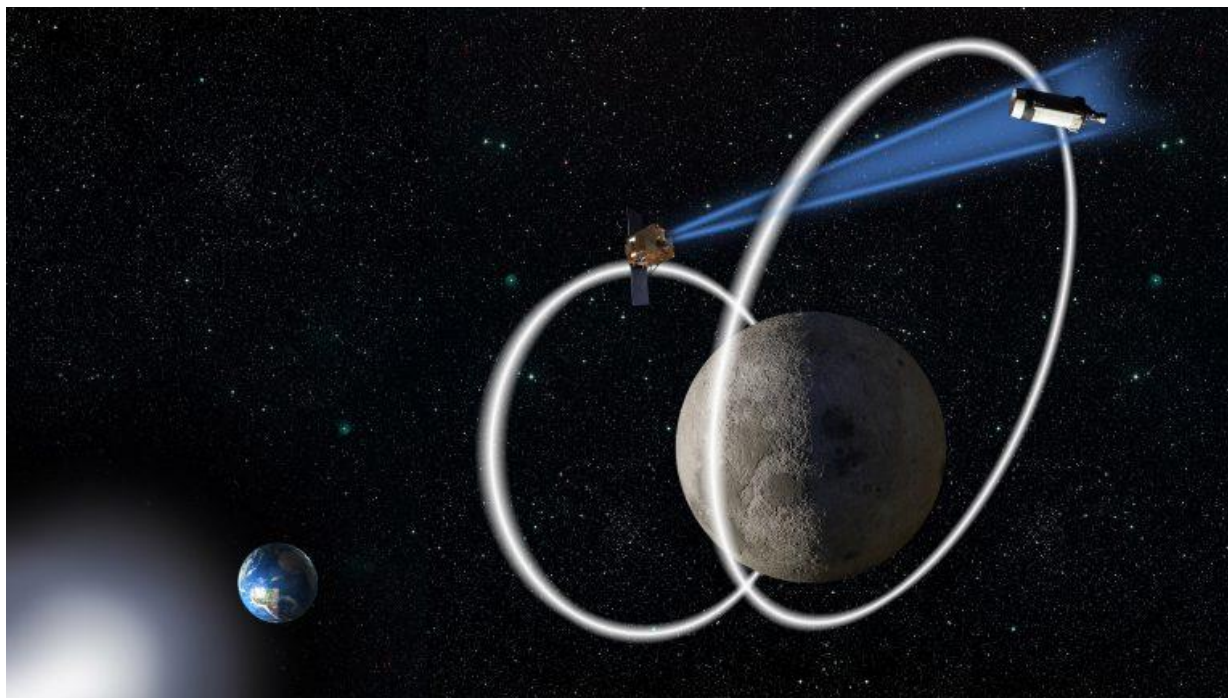
Water Found at the Chang'e 5 Landing Site



...but not very much: about 120 parts per million in the regolith and 180 ppm in a light rock. That said, it's the first time water has been detected in real time on the surface.

Articles: <https://www.space.com/china-change-5-lander-finds-water-moon>

Lunar Comsats Coming



Aquarian Space has raised seed funding to deploy a high-speed communications network for the moon, and plans to deploy its first lunar comsat in the first quarter of 2024. Aquarian Space CEO Kelly Larson said in a press statement "In 2021 there were 13 landers, orbiters and rovers on and around the moon. By 2030, we will have around 200, creating a multibillion dollar lunar economy. But this can't happen without solid, reliable Earth-to-moon communications." Spanish-German startup Plus Ultra Space Outposts plans to deploy most of its proposed lunar comsat/navsat constellation by hitching a ride with ispace, the Japanese lunar transportation venture selling accommodations on its lunar landers, maybe as soon as 2024. The Air Force Research Laboratory is asking companies to submit ideas on how they would design and develop a spacecraft to monitor outer space beyond Earth's orbit. AFRL's Space Vehicles Directorate is planning an experiment called Cislunar Highway Patrol System (CHPS). This satellite would operate in near-lunar space to detect, track and identify objects operating at lunar distances and beyond. Meanwhile, back on Earth, Kongsberg Satellite Services (KSAT) has announced it plans to establish a dedicated antenna network for lunar communications.

Articles: <https://spacenews.com/another-startup-joins-race-to-provide-high-speed-lunar-communications/>

<https://www.space.com/aquarian-space-startup-high-speed-internet-moon-mars>

<https://spacenews.com/plus-ultras-lunar-comsats-to-hitch-rides-on-ispacemoon-landers/>

<https://spacenews.com/industry-proposals-sought-for-cislunar-highway-patrol-satellite/>

<https://afresearchlab.com/technology/cislunar-highway-patrol-system-chps/>

<https://spacenews.com/ksat-invests-in-dedicated-lunar-communications-network/>

Virgin Orbit to Launch from Poland



The Polish Space Agency (POLSA) has signed a letter of intent with Virgin Orbit to use the LauncherOne air-launch system to boost Polish satellites from Polish soil as soon as next year.

Articles: <https://spacenews.com/poland-virgin-orbit-partner-on-eastern-europe-launch-initiative/>

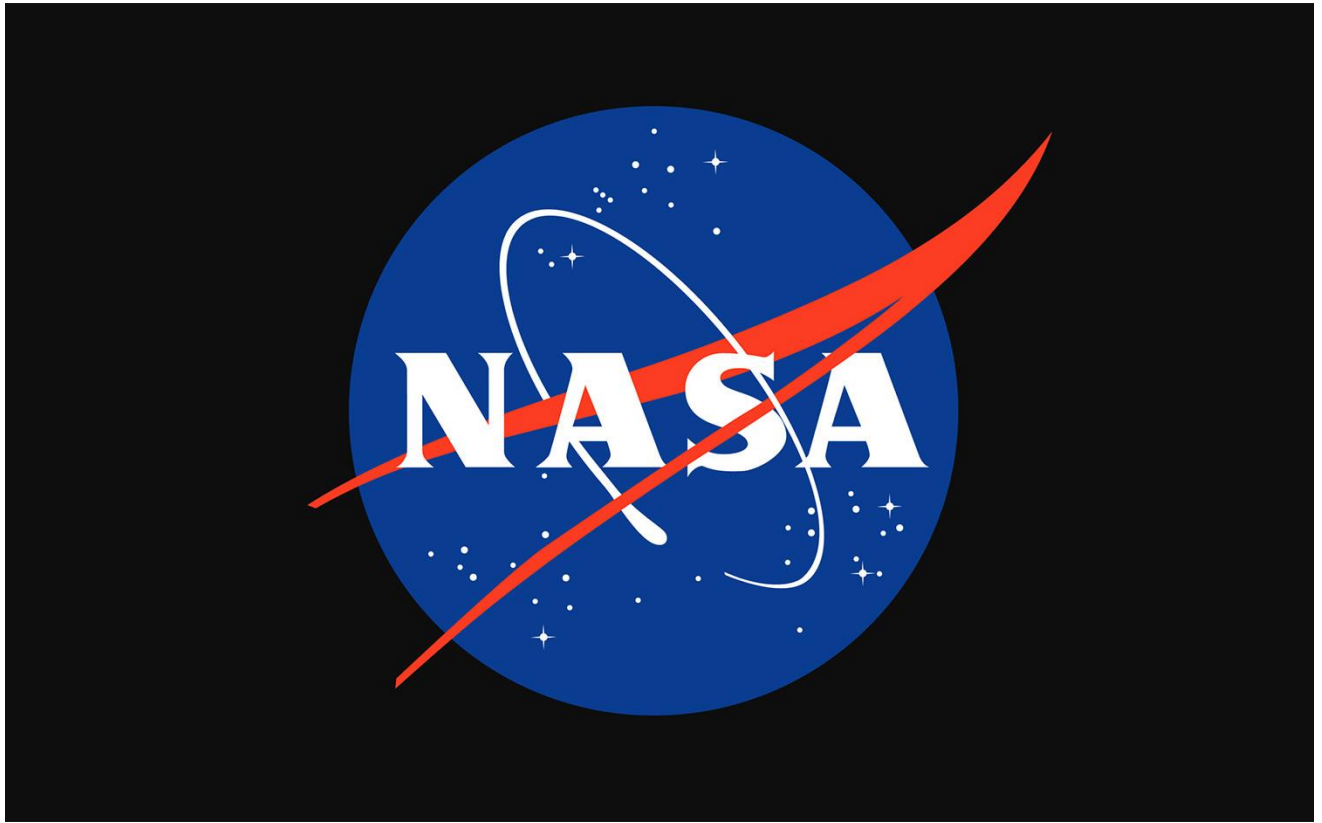
Inflation Comes for Us All



SpaceX announced it will now charge \$67 million for a Falcon 9 launch, an increase of 8%, due to "excessive levels of inflation." The cost of its Starlink service increased 11% for U.S. customers, from \$99 to \$110. SpaceX's smallsat rideshare program upped its fees 10%, now charging \$1.1 million to place up to 200 kilograms into sun-synchronous orbits, with additional mass costing \$5,500 per kg; the prices were previously \$1M and \$5K, respectively.

Article: <https://spacenews.com/blaming-inflation-spacex-raises-starlink-and-launch-prices/>

Because It's Really Important for NASA to Argue About This



Per a statement from NASA posted March 9, "NASA is fully committed to supporting every employee's right to be addressed by their correct name and pronouns. All NASA employees currently have the option and flexibility to include their gender pronouns in their customized email signature blocks. This option remains unchanged and is supported by NASA leadership so that employees can share their gender identities and show allyship to the LGBTQIA+ community." NASA's Goddard Space Flight Center had removed personal pronouns from its emails, whereupon a Reddit poster, presumably a Goddard employee, posted the assertion that they, along with others at the agency, "were shocked and disgusted by their [NASA Goddard's] decision," further labeling the move as "rebrand[ing] transphobia as professionalism."

Article: <https://www.space.com/nasa-pronouns-gender-identity-controversy>

Who Needs Russia?



This news is no big surprise: OneWeb has concluded a deal with SpaceX that will allow it to resume launching its LEO broadband constellation, with at least one launch this year. Further details were not released in its public announcement.

Articles: <https://spacenews.com/oneweb-reaches-launch-deal-with-spacex/>

Not Everybody Wants a Spaceport



On December 20 the FAA issued its 13th launch site operators license, also known as a spaceport license, to Camden County, Georgia, for its proposed Spaceport Camden. But in a special referendum held March 8 in Camden County (with only 17% of eligible voters participating) 72% voted in favor of terminating an agreement between the county government and Union Carbide to purchase property that the county intended to use for the spaceport. The election result appears headed to the Georgia Supreme Court.

Articles: <https://spacenews.com/faa-issues-license-for-georgia-spaceport/>

<https://spacenews.com/voters-block-agreement-for-planned-georgia-spaceport/>

Blood and Brain Issues for Astronauts



A new collaborative study by the European Space Agency and Russia's space agency Roscosmos shows how the brain adapts to spaceflight, finding that the brain is almost "rewired," and both fluid shifts and shape changes occur, which can last for months after a person returns to Earth. Another study, this one by researchers at the Ottawa Hospital and the University of Ottawa in Ontario, Canada, found that the astronaut's bodies destroyed about 54% more red blood cells than they would on Earth. Space anemia is a known phenomenon, but it was previously thought it would resolve over time as astronauts' bodies adapted to space. The new study revealed space anemia lasts for the entire duration of the flight.

Articles: <https://www.space.com/spaceflight-destroys-red-blood-cells>

<https://www.space.com/cosmonaut-brains-rewired-by-spaceflight>

Astra Makes Orbit Again



Photo: Astra

Astra successfully returned its Rocket 3.3 vehicle to flight March 15, placing three payloads into LEO after launch from Pacific Spaceport Complex Alaska on Kodiak Island. This mission was the first in a multilaunch agreement Astra has reached with launch services provider Spaceflight. Astra's stock price, which was hammered after its last failure, yo-yoed for the rest of the day, but settled near its lower price. It'll take more than one success to convince the market...

Article: <https://spacenews.com/astras-rocket-3-3-returns-to-flight-with-successful-launch/>

Now We Know What Spinlaunch Is



It's a launch system that fires payloads at hypersonic speeds from a ground-based centrifuge (up to 10,000 G's!), and it successfully fired its first projectile from a subscale version of its accelerator on October 22 at Spaceport America. The company has 200 employees, and hopes to begin orbital launches of 200 kg payloads in 2025.

Articles: <https://spacenews.com/spinlaunch-conducts-first-test-of-suborbital-accelerator-at-spaceport-america/>

<https://www.cnbc.com/2021/11/09/spinlaunch-completes-first-test-flight-of-alternative-rocket.html>

Flags and Footprints Redux

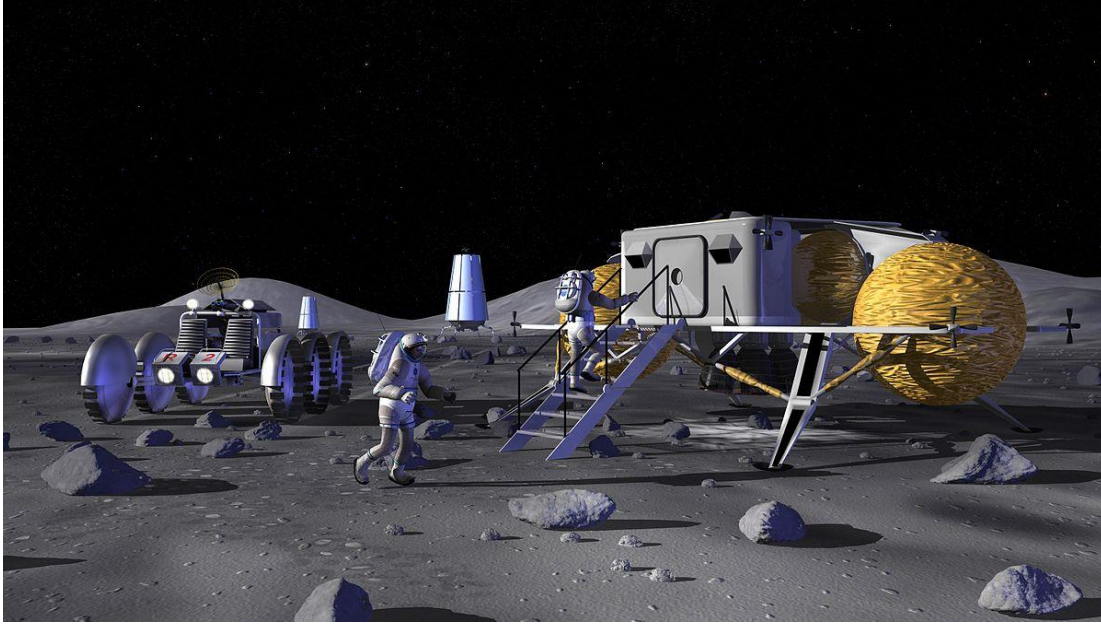


Artemis 3 is currently scheduled for 2025 as the first landing attempt. Another landing won't occur until Artemis 5 because Artemis 4 will be dedicated to building the Lunar Gateway. SLS will launch no more than once per year. Do the math. By the time Artemis 5 rolls around, NASA may have a second lander besides Starship; they've decided to fund development of a second type after all.

Articles: <https://spacenews.com/nasa-foresees-gap-in-lunar-landings-after-artemis-3/>

<https://spacenews.com/nasa-to-support-development-of-second-artemis-lunar-lander/>

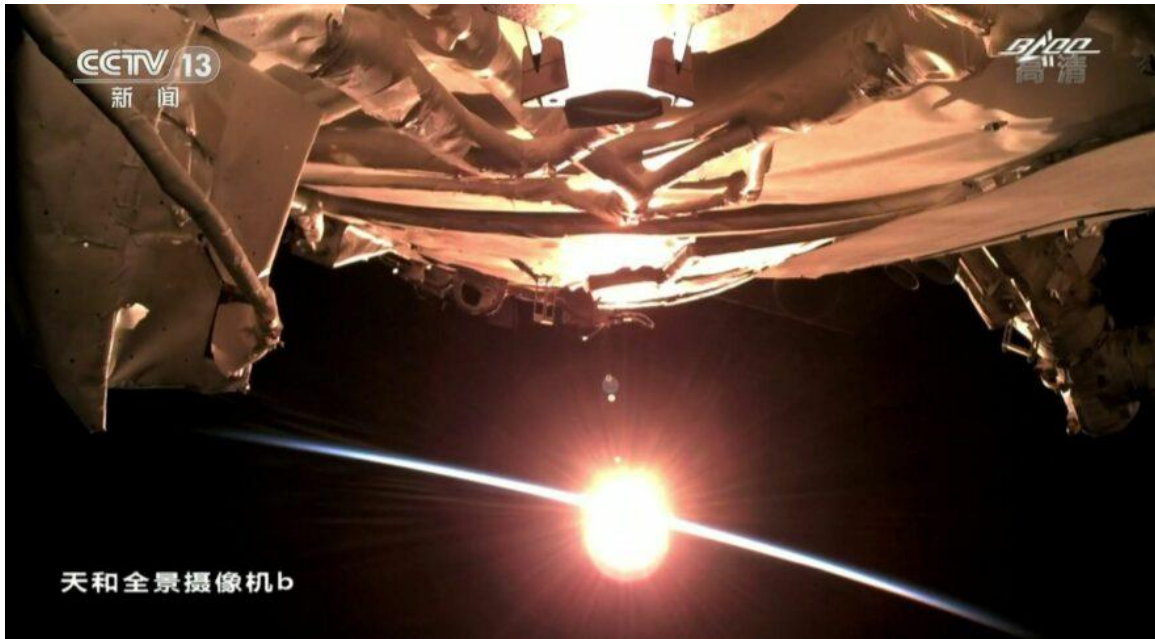
There'll Be a Mine Someday



NASA has awarded up to \$2M each to three universities to develop techniques for mining and processing of lunar materials.

Article: https://www.upi.com/Science_News/2022/03/07/NASA-lunar-mining-Artemis/7281646426839/

Busy Year for Chinese Space Station



China hopes to launch six missions this year to complete its Tiangong space station; two each for cargo, crew, and additional modules. The Tianzhou-2 cargo ship, which launched May 29, 2021, was recently deorbited after having supported two crews and after an emergency manual docking test. The Shenzhou-13 crew is scheduled to return this month; Shenzhou-14 crew to launch in May. China has announced plans to open up Tiangong to commercial customers. Former Nanoracks CEO Jeffrey Manber says Nanoracks has already lost one customer to its new competition.

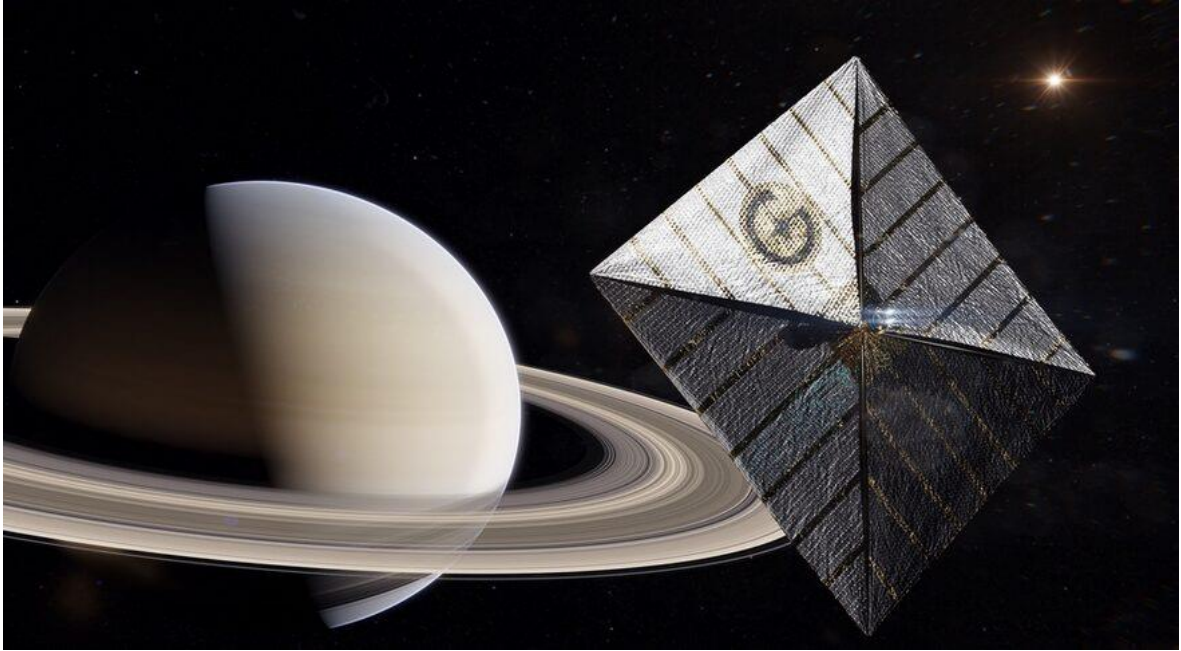
Articles: <https://www.space.com/china-shenzhou-13-emergency-docking-test>

<https://spacenews.com/china-to-open-space-station-to-commercial-activity/>

<https://spacenews.com/chinese-spacecraft-reenters-atmosphere-ahead-of-new-space-station-missions/>

<https://spacenews.com/chinas-space-station-emerges-as-competitor-to-commercial-ventures/>

Solar Sails Inc.



French startup Gama has raised 2 million euros (\$2.2M USD) in seed funding from the French public investment bank BPI, the French space agency CNES and several private investors to start work on solar sails, including a sixU cubesat demo flight planned for launch in October as a SpaceX rideshare. There's VC money in Europe, too – just not as much of it. We'll see how far they get.

Article: <https://spacenews.com/french-startup-raises-funding-to-develop-solar-sails/>

Chinese Space Tourism Companies



A Chinese company named Space Transportation (full name is Beijing Lingkong Tianxing Technology Co., Ltd.) is developing a VTHL "rocket with wings" for space tourism and point-to-point travel. Schedule: ground tests in 2023, first flight in 2024, crewed flight in 2025, orbital flight by 2030. Another company, CAS Space (a spinoff from the Chinese Academy of Sciences), is also developing its own suborbital tourism service based on a rocket that looks like a New Shepard booster with a Dragon crew capsule. CAS Space wants to start flying in 2024.

Articles: <https://www.space.com/private-chinese-space-plane-tourism-travel>

<https://www.space.com/china-suborbital-space-tourism-cas-space-rockets>

Website: <https://www.spacetransportation.com.cn/welcome.html>

Waking Up to the Hypersonic Threat



Congress gave a \$550 million increase to the Pentagon's 2022 budget to procure and launch LEO sensor satellites to track Russian and Chinese hypersonic missiles. This will kickstart the deployment of the Tracking Layer Tranche 1, a constellation of 28 IR sensor satellites that would cost about \$2.5B in total. Maybe Congress is listening to former undersecretary of defense Mike Griffin, who warned last November that the U.S. is in catch-up mode when it comes to countering this threat. "When your adversaries are telling you that they are out to take you down, we should listen," Griffin said then. "We don't listen well, but maybe we should."

Articles: <https://spacenews.com/mike-griffin-critical-of-slow-u-s-response-to-chinas-advances-in-hypersonic-weapons/>

<https://spacenews.com/dod-estimates-2-5-billion-price-tag-for-global-constellation-to-track-hypersonic-missiles/>

This Week At NASA

Videos: https://www.nasa.gov/multimedia/podcasting/twan_index.html

That's All Folks



ISS astronauts perform final spacewalk

captured from Matthias Maurer's hometown through a telescope



Ground-based photo by Dr. Sebastian Voltmer. See more at www.voltmer.photo and follow him @sebastianvoltmer on Insta and @SeVoSpace on Twitter