



November 2023

Update

**Oklahoma Space  
Alliance**

A Chapter of The  
National Space Society

A free email newsletter of the Oklahoma Space Alliance

## Cosplay in Space



Credit: NASA

**November 2023 OSA  
Meeting**

**Saturday, November 11, 2023**

**2:00 PM**

**Norman Computers**

916 W Main St, Norman, OK 73069

405-863-6173

Program— Space News and  
Events

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



## Quote of the Month

*Give us, O God, the vision which can see Your love in the world in spite of human failure. Give us the faith to trust Your goodness in spite of our ignorance and weakness. Give us the knowledge that we may continue to pray with understanding hearts. And show us what each one of us can do to set forward the coming of the day of universal peace. – Frank Borman (Prayer from Apollo 8 on Christmas Day, December 25, 1968)*

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## Oklahoma Space Alliance Update

November 11, 2023

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## One Down, Nine to Go



Credit: NASA/Goddard/SwRI/Johns Hopkins APL/NOAO

On November 1, NASA's Lucy spacecraft successfully completed a flyby of asteroid Dinkinesh, aka 'Dinky,' the first of 10 asteroids the probe will visit over the next 12 years – and discovered it's really a binary asteroid – and its satellite is itself a contact binary. Most of Lucy's targets are Trojan asteroids, but this one is in the main asteroid belt.

Articles: <https://phys.org/news/2023-10-nasa-lucy-spacecraft-approach-asteroid.html?fbclid=IwAR3VFk34hKm24KKO2L5NxtJMQ2xA7i1-ypYIOJcmhpxNZyZ-W08XtIjXj0>

<https://www.space.com/lucy-flyby-dinkinesh-successfully-completed>

<https://www.space.com/lucy-asteroid-flyby-dinkinesh-binary-system>

<https://www.space.com/nasa-lucy-asteroid-dinky-3-space-rocks-contact-binary>

# The First Space Battle



Credit: Israeli Defense Ministry

Technically, the first exoatmospheric battle, the first ever combat interception in space. Between Israel and Houthi rebels in Yemen. Who saw **that** coming?

Articles: <https://www.jpost.com/israel-news/defense-news/article-771910>

<https://www.telegraph.co.uk/world-news/2023/11/04/how-israel-shot-down-ballistic-missile-in-space-houthis/>

<https://breakingdefense.com/2023/10/in-first-israels-arrow-air-defense-system-intercepts-ballistic-missile-near-red-sea-idf/>

## He Was One of a Kind



Credit: Northrop Grumman

Frank Borman, our oldest living astronaut, has died at 95. We wouldn't have made it to the moon without him.

Articles: <https://www.space.com/apollo-8-astronaut-frank-borman-obituary>

## Coming Up On the Outside Track



Credit: ISRO

India says it will put its own astronauts on the moon by 2040, after putting up its own space station in the mid-2030s. Its plans to put its astronauts into orbit on an Indian-built rocket in an Indian-built spacecraft called Gaganyaan took a step closer to reality with the successful October 21 test of Gaganyaan's crew-escape rocket.

Articles: <https://spacenews.com/india-tests-launch-escape-system-in-step-towards-sending-astronauts-to-orbit/>

<https://www.space.com/india-tv-d1-test-flight-future-gaganyaan-astronaut-mission>

<https://spacenews.com/india-sets-2040-target-for-crewed-moon-landing/>

## It Couldn't Happen to a Nicer Guy



Credit: Virgin Galactic

Really, it couldn't. Alan Stern, principal investigator of NASA's New Horizons mission to Pluto, was one of the passengers on VG's latest flight. Galactic 05 will be the final flight for Virgin Galactic in 2023, they're standing down for a standard inspection of their vehicles before resuming flight in January 2024. But the launch pace will slow again, and there'll only be a handful more flights of the current vehicle. On November 7, VG announced a "strategic realignment of the Company's resources and a related workforce reduction" to allow the company to focus on development of the Delta class of vehicles on which the company has pinned its future hopes. No commercial flights on Deltas until at least 2026.

Articles: <https://www.space.com/virgin-galactic-05-mission-success-stern-gerardi>

<https://spacenews.com/virgin-galactic-carries-researchers-on-fifth-commercial-suborbital-flight/>

<https://spacenews.com/virgin-galactic-to-perform-suborbital-research-flight-in-november/>

<https://spacenews.com/virgin-galactic-lays-off-staff-as-it-focuses-on-next-generation-suborbital-vehicle/>

<https://spacenews.com/virgin-galactic-to-halt-unity-suborbital-flights-by-mid-2024/>

# So When Do We Get to Fly Again?



Credit: SpaceX

“Starship has been ready for its next flight test for more than a month, but we are waiting for an FAA license and accompanying interagency review,” said Bill Gerstenmaier, vice president of build and flight reliability at SpaceX in his opening remarks to a hearing of the Senate Commerce Committee’s space subcommittee on October 18. SpaceX has completed its work on the 63 corrective actions required by the FAA after the first Starship launch, and made many other changes of its own. Now it’s marking time with tests on the vehicle while it waits for

Articles: <https://spacenews.com/faa-closes-starship-mishap-investigation-directs-63-correctiv>  
<https://www.space.com/spacex-completes-faa-starship-corrective-actions-elon-musk-s>  
<https://www.space.com/spacex-starship-second-launch-possible-october-2023>  
<https://spacenews.com/faa-seeks-to-wrap-up-starship-safety-review-in-october/>  
<https://spacenews.com/spacex-frustrated-by-starship-licensing-delays/>  
<https://www.space.com/faa-finishes-spacex-starship-safety-review>  
<https://spacenews.com/faa-completes-safety-review-for-next-starship-launch/>

## A Slow Learning Curve





Credit: Blue Origin

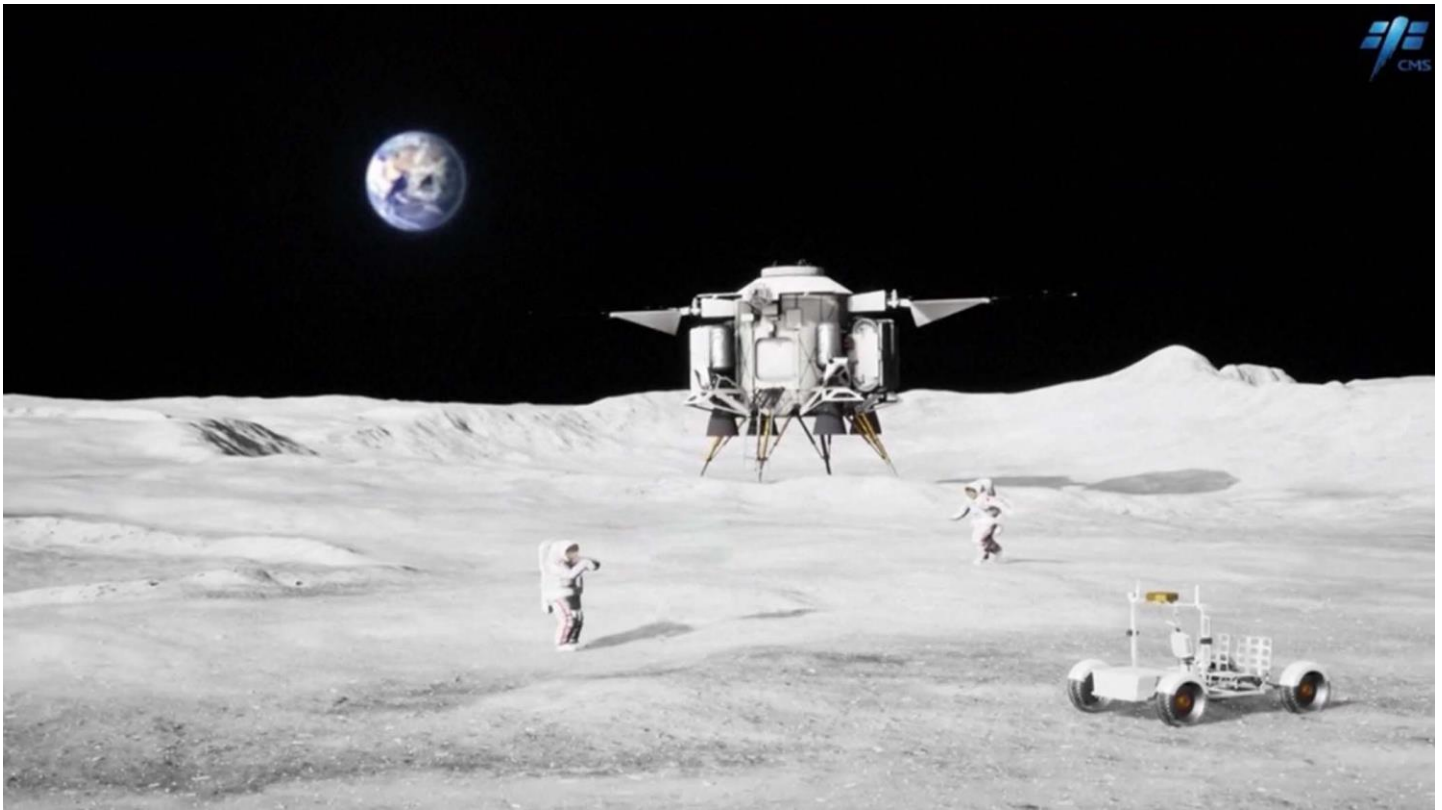
It's controversial, and not a done deal, but extension of the FAA's moratorium on writing regulations for space tourism is looking likely. Way back when he was still Speaker of the House, on September 21, Kevin McCarthy introduced the Space Transformation and Reliability (STAR) Act, a one-page bill to extend the moratorium for another eight years. The Continuing Resolution for stopgap government funding passed on September 30 included a three-month extension of the learning period, to January 1. Kelvin Coleman, FAA associate administrator for commercial space transportation, says "We expect it will be pushed out further. How far out we don't know." The current flight rate is too low to have given the regulators the experience they thought they'd have by this point.

Articles: <https://spacenews.com/house-speaker-introduces-bill-to-extend-commercial-spaceflight-regulatory-learning-period/>

<https://spacenews.com/stopgap-spending-bill-includes-faa-learning-period-extension/>

<https://spacenews.com/faa-anticipates-extension-of-commercial-spaceflight-regulatory-learning-period/>

## Nothing Like Long-Term Thinking



Credit: CMS

Wang Wei, a scientist affiliated to CASC, China’s main space contractor, and the Chinese Academy of Sciences (CAS), is proposing a four-stage roadmap for a space resources utilization project titled Tiangong Kaiwu. Taking its name from Ming Dynasty scientist Song Yingxing’s work, “The Exploitation of the Works of Nature,” the plan would encompass the entire solar system by 2100.

Article: <https://spacenews.com/chinese-scientist-proposes-solar-system-wide-resource-utilization-roadmap/>

## The Blob



Credit: SpaceX

During the 268th spacewalk overall in support of ISS maintenance, cosmonauts Oleg Kononenko and Nikolai Chub got an up-close – too close – view of a coolant leak that was first observed flowing from an external radiator on the Nauka module earlier this month. Kononenko planned to sop up the coolant “blob” with a cloth towel but was told to leave the area immediately when he reported some of the liquid had made it onto a safety tether. He said none had reached his suit. The cosmonauts bagged the tether and left it outside before concluding the EVA.

Articles: <https://www.space.com/russian-spacewalk-nauka-radiator-leak-october-2023>  
<https://spaceflightnow.com/2023/10/25/russian-spacewalkers-to-inspect-leaking-radiator/>

## Everybody Wants Reusable Rockets



Credit: Stoke Space

Stoke Space flew its Hopper2, a testbed for a reusable second stage of a vehicle intended to be fully reusable and ready for orbital test in 2025, on a 15-second hop on September 17. The four-year-old company was co-founded by two propulsion engineers who used to work at Blue Origin. Beijing Interstellar Glory Space Technology Ltd., aka iSpace, launched its own single-stage hopper called Hyperbola-2Y, a testbed for a rocket with a reusable first stage also slated to debut in 2025, on a 51-second flight at the Jiuquan Satellite Launch Center on November 2. Another Chinese company, Space Pioneer, hopes the first launch of its Falcon-9-class Tianlong-3 with a reusable first stage will take place in 2024. And JAXA's roadmap for its program includes a new rocket with reusable first stage (possibly fully reusable) to come online in the 2030s.

Articles: <https://spacenews.com/stoke-space-flies-reusable-upper-stage-prototype/>

<https://arstechnica.com/space/2023/09/stoke-space-hops-its-upper-stage-leaping-toward-a-fully-reusable-rocket/>

<https://spacenews.com/chinas-ispacelaunches-and-lands-rocket-test-stage/>

<https://spacenews.com/chinas-space-pioneer-raise-funding-for-its-falcon-9-class-rocket/>

<https://spacenews.com/japan-conducting-studies-for-reusable-next-gen-rocket/>

## The Devil Has Company



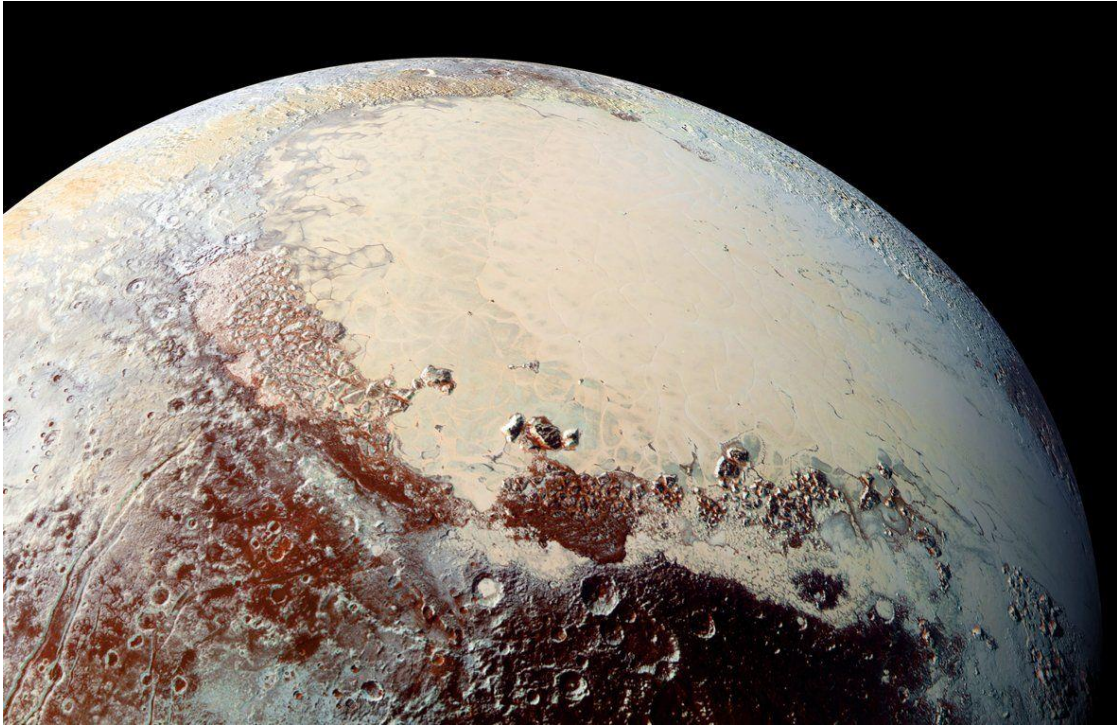
Credit: NASA

The devil won't be the only one wearing Prada. When the Artemis 3 crew makes the first American footprints on the moon since 1972 (and presumably the first female footprints) they'll be doing it in spacesuits designed with input from Prada. Axiom Space, selected by NASA in 2022 to design the Artemis 3 suits, has partnered with the Italian luxury fashion house Prada to design them. Meanwhile, NASA is looking for spacesuit material that will solve the lunar dust problem that made Apollo suits almost unusable after only three EVAs. A flexible, stretchable moon fabric prototype called LiqMEST (Liquid Metal Electrostatic Protective Textile) under development at Hawai'i Pacific University (HPU) just received a \$50,000 grant from NASA. LiqMEST will use electrostatic forces to repel moon dust.

Articles: <https://www.space.com/axiom-space-prada-artemis-3-moon-spacesuits>

<https://www.space.com/moon-spacesuit-dust-static-electric-field-hawaii-pacific-university>

## Not Dead Yet



Credit: NASA

New Horizons isn't dead yet, and neither, evidently, is Pluto. In their continued examination of the data from New Horizons' flyby of Pluto in 2015, scientists studying an unusual crater near the bright, heart-shaped region called Sputnik Planitia say they may have found a supervolcano that likely erupted just a few million years ago, an eyeblink in geological time. If true, that means Pluto can't be a solid iceball; it still has some interior heat.

Articles: <https://www.space.com/new-horizons-pluto-subsurface-ocean>

## A Cornucopia, When They Can Get It Open



Credit: NASA/James Blair

NASA wanted at least 60 grams from Bennu, but Osiris-REX brought back more – lots more. They got 70.3 grams from the outer shell, without even opening up the sample head. That operation is stalled because, per the team's blog post, "After multiple attempts at removal, the team discovered two of the 35 fasteners on the TAGSAM head could not be removed with the current tools approved for use in the OSIRIS-REx glovebox." A bit of the sample is already on display at the Smithsonian.

Article: <https://www.space.com/osiris-rex-asteroid-sample-passes-goal>

<https://www.space.com/smithsonian-osiris-rex-bennu-asteroid-unveiling>

## Sea Launching Makes a Comeback



Credit: Galactic Energy

The concept of launching from ocean platforms is not dead. On May 22, in a proof-of-concept test, The Spaceport Company hosted four sounding rocket launches with propulsion systems supplied by Evolution Space from a platform in the Gulf of Mexico. The ninth successive successful launch for China's Galactic Energy, early on the morning of September 5, was also its first sea launch. GE's Ceres-1 solid rocket, carrying four satellites for Guodian Gaoke, a commercial firm constructing its Tianqi low-Earth orbit narrow-band Internet of Things constellation, flew from a transport erector launcher on a mobile sea platform off the coast of Haiyang.

Articles: <https://spacenews.com/chinese-ceres-1-rocket-reaches-orbit-with-first-sea-launch/>  
<https://spacenews.com/startup-developing-sea-based-launch-pads/>  
<https://spacenews.com/the-spaceport-company-demonstrates-offshore-launch-operations/>  
<https://www.space.com/rocket-launch-us-territorial-waters-floating-pad>

## Spain Joins the Party





Credit: PLD Space

Spain is the latest entrant into the club of nations with launch vehicles of their own. Spanish launch vehicle startup PLD Space notched up a successful first flight of its suborbital Miura 1 vehicle on October 7. Miura 5, in development, will eventually be capable of putting 500 kg in LEO; first customers are due to sign contracts next year. Another Spanish startup (Arkadia Space, founded by former members of PLD Space’s propulsion team) has raised money for development of a “green propulsion” alternative to hypergolic propellants for in-space propulsion.

Articles: <https://spacenews.com/pld-space-prepares-for-suborbital-test-launch/>

<https://spacenews.com/pld-space-calls-first-launch-a-success/>

<https://spacenews.com/spanish-propulsion-startup-raises-seed-round/>

## They’ll Get Home Eventually



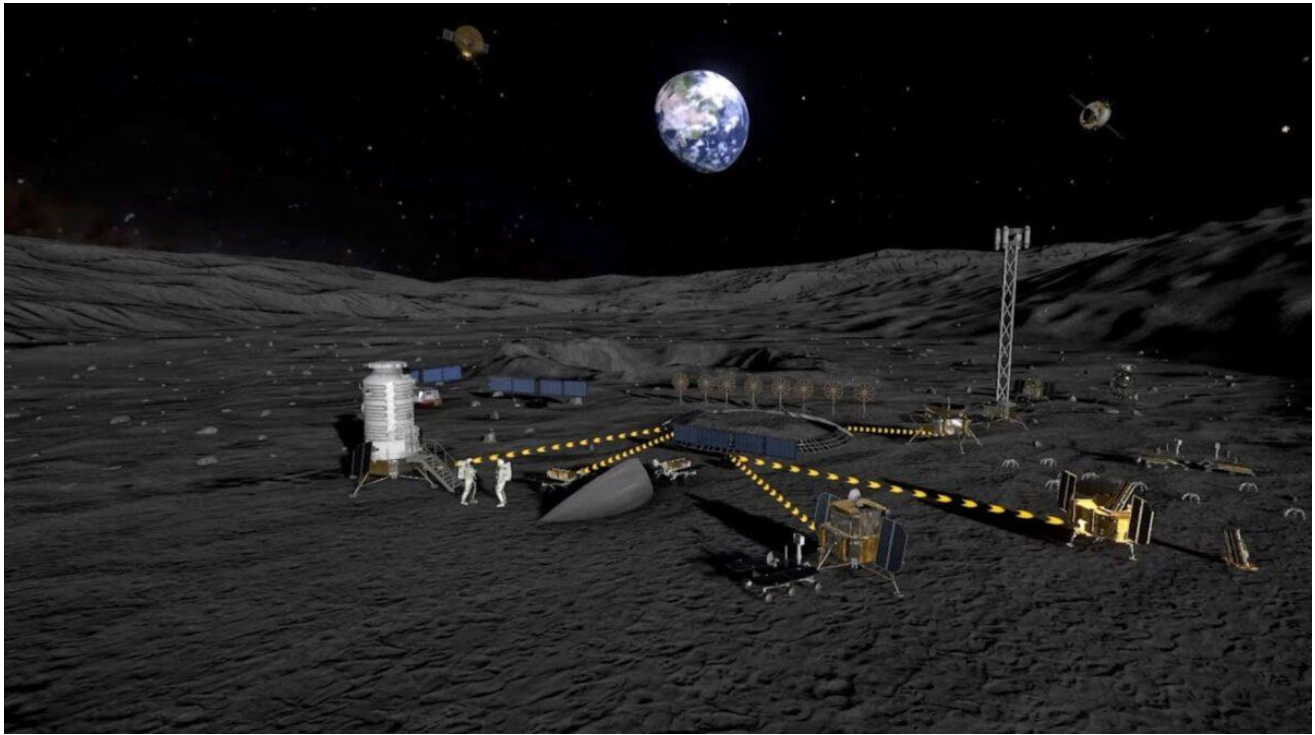
Credit: Varda Space Industries

On October 9, Varda Space Industries announced that it has an agreement with Southern Launch, a spaceport operator based in Adelaide, Australia, to land its spacecraft will land at the Koonibba Test Range northwest of Adelaide. Meanwhile, Varda continues work to secure approvals to land its first spacecraft in Utah.

Articles: <https://www.space.com/vara-space-industries-australia-capsule-landings>  
<https://spacenews.com/vara-partners-with-australian-range-for-capsule-landings/>

## But All the Cool Kids Are with Us





Credit: CNSA/Roscosmos

On September 14, Germany finally got around to signing the Artemis Accords, becoming the 29<sup>th</sup> signatory. Days later, Iceland and the Netherlands then came aboard as 30<sup>th</sup> and 31<sup>st</sup> signatories. Bulgaria became the 32<sup>nd</sup> on November 9. Meanwhile, China has added South Africa, Pakistan, Belarus and Azerbaijan to its International Lunar Research Station project. Venezuela, the first outside nation to join ILRS, seems to think China will be flying a Venezuelan astronaut to the moon someday – but China conspicuously failed to echo the sentiment when President Maduro voiced it in conjunction with the signing of a China-Venezuela space cooperation framework agreement. China continues to look for international partners, as shown in remarks by Chinese space officials at a session of the International Astronautical Congress in Paris on September 21.

Articles: <https://spacenews.com/germany-signs-artemis-accords/>

<https://spacenews.com/netherlands-and-iceland-sign-artemis-accords/>

<https://spacenews.com/south-africa-joins-chinas-moon-base-project/>

<https://spacenews.com/pakistan-becomes-latest-country-to-join-chinas-ilrs-moon-project/>

<https://spacenews.com/china-adds-belarus-as-partner-for-ilrs-moon-base/>

<https://spacenews.com/azerbaijan-signs-up-to-chinas-international-moon-base-project/>

<https://spacenews.com/china-seeks-new-partners-for-lunar-and-deep-space-exploration/>

<https://www.space.com/nasa-bulgaria-signs-artemis-accords>

## This Week At NASA

Videos: [https://www.nasa.gov/multimedia/podcasting/twan\\_index.html](https://www.nasa.gov/multimedia/podcasting/twan_index.html)

# That's All Folks



Credit: SpaceX

