



September 2024

Update

**Oklahoma Space
Alliance**

A Chapter of The
National Space Society

A free email newsletter of the Oklahoma Space Alliance

Red Sprite Lightning Seen from ISS



Credit: Matthew Dominick/NASA/X



August 2024 OSA Meeting

Saturday, September 14, 2024

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

Some people are born to be cowboys and ride a horse. I'm born to ride a rocket and be in space. – Don Pettit

Table of Contents

Aurora from ISS.....	1
September 2024 OSA Meeting.....	1
Quote of the Month.....	1
Table of Contents.....	2
Apparently It Was Haunted.....	3
Will They Ever Learn?.....	4
Boldly Going.....	5
Petit Rides Again.....	6
Slipping?	7
New Shepard Returns to Flight.....	8
Which Side Are You On, Boys?.....	9
The Last Vega Flies.....	10
A Vote of No Confidence.....	11
They'll Get There Eventually.....	12
600%.....	13
(NH ₄)MgCl ₃ ·6H ₂ O.....	14
Helium-3 Lunar Mining by 2030?	15
Better Luck Next Time.....	16
Sail On, Silver Girl.....	17
Something's Gotta Give	18
China's SpaceX Copycat Hits 10 Kilometers.....	19
This Week At NASA	20
That's All Folks	21

Oklahoma Space Alliance Update

September 14, 2024

Editor Cliff McMurray

Asst Editor Claire McMurray

cliffmcmurray@hotmail.com

405-863-6173 (C)

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.

OSA Officers for 2024

President Adam Hemphill

ahemphil@gmail.com

405-863-6173 (C)

Vice President David Sheely

david.sheely51@gmail.com

405-8321-9077 (C)

Secretary & Outreach Editor Syd Henderson

sydh@ou.edu

405-321-4027(H)

405-365-8983(C)

Treasurer Tim Scott

ctsscott@mac.com

405-740-7549(H)

NSS Headquarters

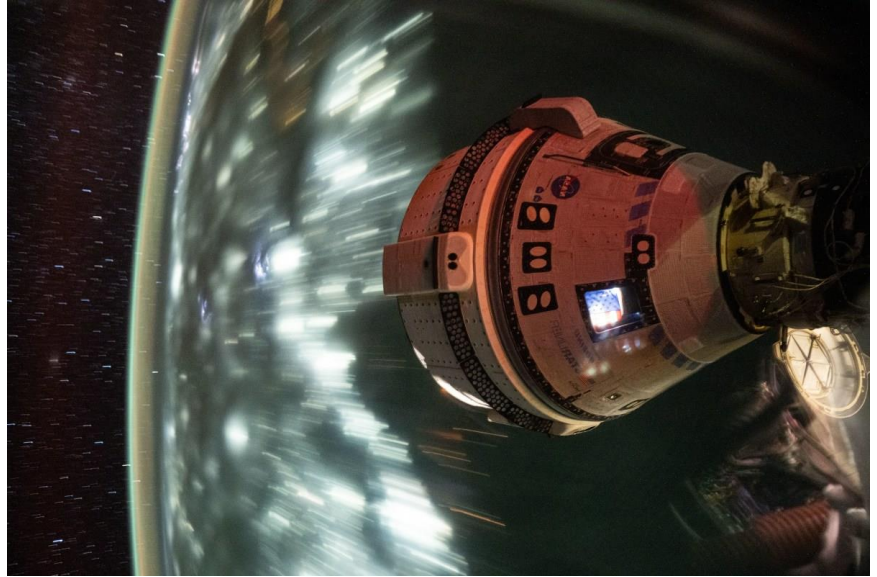
1155 15th Street NW, Suite 500 Washington DC 20005

Exec Director Kirby Ikin

nsshq@nss.org

202-429-1600

Apparently It Was Haunted



Credit: NASA

"There are several noises I'd prefer not to hear inside my spaceship, including this one that Boeing Starliner is now making," former Canadian astronaut Chris Hadfield wrote in a post on X. Starliner crewman Butch Wilmore first noticed the noises on August 31; Mission Control explained them ("pulsing noise, almost like a sonar ping") as due to speaker feedback in the audio system. Wilmore and Suni Williamson won't have to worry about it, in any event. NASA decided to return Starliner unmanned – which they did on September 7 – and bring its erstwhile crew home on the next Crew Dragon next February. Their planned eight-day shakedown cruise has turned into an eight-month tour on the ISS. Boeing's humiliation is complete, and options traders had a chance for some quick cash if they shorted Boeing stock.

Articles: <https://arstechnica.com/space/2024/09/starliners-speaker-began-emitting-strange-sonar-noises-on-saturday/>

<https://www.space.com/strange-noise-boeing-starliner-spacecraft>

<https://spacenews.com/starliner-to-return-from-iss-without-astronauts-on-board/>

<https://www.space.com/nasa-boeing-starliner-astronauts-will-return-on-spacex-dragon-2025>

<https://spacenews.com/starliner-returns-to-earth-uncrewed/>

Will They Ever Learn?



Credit: NASA/Robert Markowitz

Apollo 13 should have taught NASA a permanent lesson about the need for compatibility between spacecraft systems, but it seems the lesson was forgotten. Turns out that Starliner spacesuits are incompatible with Crew Dragon life support systems, so if the ISS crew should have to evacuate in the weeks between Starliner's departure and the arrival of the next Crew Dragon carrying SpaceX suits for the stranded Starliner crew, Wilmore and Williams will have to face undocking and reentry without spacesuits.

Article: <https://www.space.com/boeing-starliner-astronauts-nasa-spacex-crew-dragon>

Boldly Going



Credit: SpaceX webcast

...where no private spacefarers have gone before. Polaris Dawn launched in the early morning hours of September 10. Billionaire entrepreneur Jared Isaacman, making his second ride to orbit on a Falcon 9, heads a crew of four private astronauts. The same day, the modified Crew Dragon “Resilience” raised its orbit, hitting an apogee of 870 miles (1,400 km) before settling into an elliptical 118 x 746-mile orbit. That’s the highest humans have flown since Apollo 17, double the shuttle’s altitude record and surpassing the record for humans remaining in earth orbit set by Gemini 11 in 1966. They spent six orbits there before lowering their apogee to 700 km for the other mission highlight, the first private spacewalk. Isaacman and mission specialist Sarah Gillis spent about eight minutes each standing up in the hatchway, testing new SpaceX EVA suits without floating free of the ship. Gillis, a violinist, released a new music video from space the next day.

Articles: <https://spacenews.com/crew-dragon-launches-on-polaris-dawn-private-astronaut-mission/>

<https://www.space.com/spacex-polaris-dawn-astronaut-mission-launch-success>

<https://www.space.com/polaris-dawn-altitude-record-gemini-11>

<https://www.space.com/polaris-dawn-music-video-harmony-of-resilience>

<https://www.space.com/spacex-new-eva-spacewalking-spacesuit-video>

<https://spacenews.com/polaris-dawn-astronauts-perform-spacewalk/>

<https://www.space.com/spacex-polaris-dawn-first-private-spacewalk>

Petit Rides Again



Credit: NASA

The latest crew rotation to ISS is normally not very newsworthy, but the three-person crew of the Soyuz that launched out of Baikonur on September is an exception. First, because the all-veteran crew of NASA astronaut Don Pettit, Roscosmos cosmonauts Alexey Ovchinin and Ivan Vagner brought the total number of human beings in orbit to a new record of 19 (20 people have been in space before at one time, but six of them were in suborbital space); second because 69-year-old Pettit is something of an icon in the astronaut corps. The engineer is known as the astronaut MacGyver, with several inventions to his credit, including a zero-g drinking cup that uses surface tension to keep the liquid from escaping. His first mission, ISS Expedition 6, was expected to last 2.5 months, but, as recounted in the excellent book *Too Far From Home*, he and his fellow crewman Ken Bowersox were stranded aboard ISS for an additional two months after the *Columbia* disaster grounded the shuttle fleet. Pettit last flew in space in 2013. He already has 370 days in space; this, his fourth flight, will add to that total another six months.

Articles: <https://www.space.com/international-space-station-soyuz-ms-26-launch>
<https://www.space.com/don-pettit-nasa-astronaut-space-macgyver-iss>

Slipping?



Credit: SpaceX

Grounded by the FAA twice in two months. First came the failure of SpaceX's Falcon 9 second stage engine on a July 11 launch. Now a Falcon 9 first stage failed to stick the landing for the first time in three and a half years, falling over and exploding after an apparently successful landing a SpaceX drone ship on August 28. This time the FAA grounding lasted only two days, although its investigation of this second mishap continues. SpaceX wasted no time getting back to business: a Falcon 9 lifted off from Cape Canaveral Space Force Station's on August 31. It was followed just 65 minutes later (a new record) by another Falcon 9 launching out of Vandenberg. Cargo for both was Starlinks.

Articles: <https://www.space.com/spacex-falcon-9-rocket-23rd-launch-landing-failure>

<https://spacenews.com/falcon-9-booster-lost-in-rare-unsuccessful-landing/>

<https://spacenews.com/faa-pauses-falcon-9-launches-to-investigate-failed-booster-landing/>

<https://spacenews.com/faa-pauses-falcon-9-launches-to-investigate-failed-booster-landing/>

New Shepard Returns to Flight



Credit: Blue Origin webcast

On August 29, Blue Origin's New Shepard carried six paying passengers to suborbital space for the first time since May. The previous flight suffered an anomaly with parachute deployment; the flight before that lost the booster in a crash. This flight, designated NS-26, followed an unmanned flight to verify that the problems had been fixed, and it went perfectly. Among the passengers was a University of Florida professor conducting experiments under the NASA Flight Opportunities Program, and a 21-year-old UNC student who became the youngest person to cross the 100-km. Karman Line.

Articles: <https://spacenews.com/blue-origin-sets-date-for-next-new-shepard-flight-after-completing-parachute-investigation/>

<https://www.space.com/blue-origin-ns-26-suborbital-space-tourism-launch>

<https://spacenews.com/blue-origin-flies-nasa-funded-scientist-and-space-tourists-on-new-shepard-suborbital-flight/>

Which Side Are You On, Boys?



Credit: Space Cadets 4 Harris

Like everyone else in the country, the space community is choosing up sides for the upcoming presidential election. Former astronaut John Grunsfeld (he also served as NASA chief scientist, and associate administrator of NASA's Science Mission Directorate) spearheaded a virtual fundraiser to support the Harris-Walz presidential campaign on August 15. The event, which featured remarks from Bill Nye, former Virgin Galactic CEO (and congressional candidate) George Whitesides, two former NASA administrators (Charlie Bolden, Democrat, and Sean O'Keefe, Republican), commercial astronaut Sian Proctor, and a handful of Star Trek stars, raised more than \$50K for the Democrat contender.

Articles: <https://payloadspace.com/former-astronaut-hosts-space-cadets-4-harris-fundraiser/>

<https://nasawatch.com/election-2024/space-cadets-4-harris/>

<https://spacenews.com/republican-former-nasa-administrator-endorses-harris-for-president/>

The Last Vega Flies

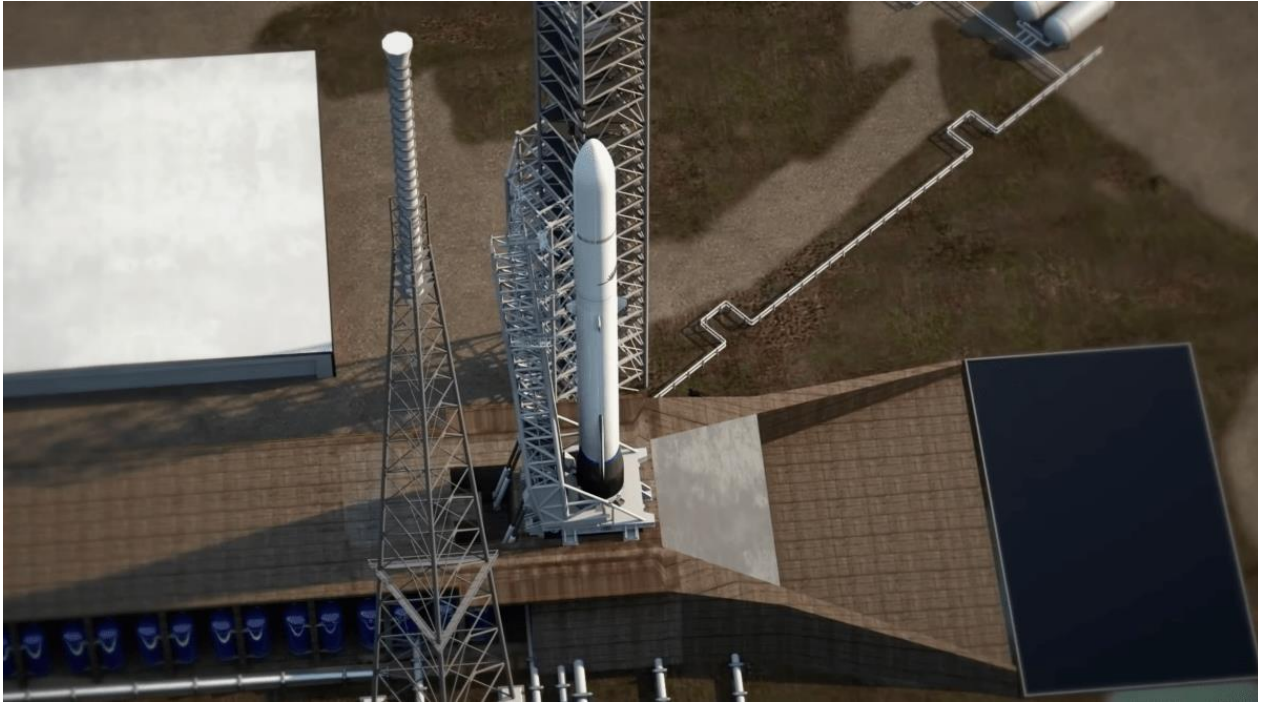


Credit: Arianespace

ESA's Vega smallsat launcher debuted in February 2012. With its final flight on September 4, it has flown a total of 22 missions, 20 of them successful. Arianespace is transitioning its smallsat operations to the new, more powerful Vega C, which already has two successful launches under its belt. The last Vega carried Sentinel-2C, a part of Europe's Copernicus Earth observation program.

Article: <https://www.space.com/arianespace-final-vega-rocket-launch>

A Vote of No Confidence



Credit: Blue Origin

Blue Origin can stand down from its race to meet an October deadline. NASA has decided to remove the twin ESCAPADE (Escape and Plasma Acceleration and Dynamics Explorers) smallsats from the first New Glenn flight, unconvinced that Blue Origin is certain to make the October launch window for Mars. They may give New Glenn a second chance to send ESCAPADE to Mars next spring, outside the traditional launch window. The first New Glenn, whenever it launches, will now carry unspecified technology for its Blue Ring orbital transfer vehicle, and serve as its first certification launch for the Space Force's National Security Space Launch program; those were originally planned for its second flight.

Article: <https://spacenews.com/nasa-removes-escapade-from-inaugural-new-glenn-launch/>

<https://www.space.com/nasa-delays-escapade-mars-launch-on-blue-origin-new-glenn-rocket-2025>

<https://spacenews.com/blue-origin-racing-to-meet-tight-launch-window-for-first-new-glenn-mission/>

They'll Get There Eventually...



Credit: ESA/JAXA

...even if they have to take a slower trajectory. ESA has been forced to adjust the trajectory of its BepiColombo mission to Mercury, due to thrusters no longer operating at full capacity. Even at the 90% they are able to coax out of the thrusters, they don't have the thrust necessary to get into orbit around Mercury in December 2025; the new trajectory will get them into orbit in November 2026. BepiColombo made the fourth of six preliminary flybys on September 4, just 103 miles above the surface, and got the most spectacular photos yet. Meanwhile, China has apparently managed to get its two lunar satellites DRO-A and DRO-B into distant retrograde orbit as originally intended, after a launch anomaly back in March left them stranded in LEO. And the orbiter for the Chang'e-6 lunar sample return mission has now made its way to Earth-Sun's L2.

Articles: <https://spacenews.com/esa-delays-bepicolombo-orbital-insertion-because-of-thruster-problem/>

<https://www.space.com/bepicolombo-thruster-issues-mercury-arrival-delay-2026>

<https://www.space.com/bepicolombo-mercury-probe-flyby-images>

[https://www.esa.int/Science Exploration/Space Science/BepiColombo/BepiColombo s best images yet highlight fourth Mercury flyby](https://www.esa.int/Science_Exploration/Space_Science/BepiColombo/BepiColombo_s_best_images_yet_highlight_fourth_Mercury_flyby)

<https://spacenews.com/chinese-spacecraft-appear-to-reach-lunar-orbit-despite-launch-setback/>

<https://spacenews.com/change-6-orbiter-turns-up-at-sun-earth-lagrange-point-after-moon-sampling-mission/>

600%



Credit: NASA/David Zeiters

Hen Bechtel won the cost-plus contract for the Mobile Launcher 2 (ML-2) platform for the SLS rocket in 2019, the projected cost was \$383M, and delivery was targeted for March 2023. The project's cost now sits an estimated \$1.8B, and NASA's most recent Office of Inspector General report, issued August 27, says the final cost could grow to \$2.7B — more than six times the initial cost estimate — by the time ML-2 is delivered, four and a half years late, in September 2027. Another OIG report, issued three weeks earlier, found Boeing's work on the SLS core and upper stages at the Michoud Assembly Facility in New Orleans to be also well below expectations, which it blamed on an inadequate quality management system and poorly trained workforce. There's seemingly no end to Artemis' bad news; NASA's internal analysis estimates a nearly one-in-three chance the Artemis 3 lander will be at least a year and a half late.

Article: <https://www.space.com/nasa-inspector-general-report-mobile-launcher-2-artemis-sls>

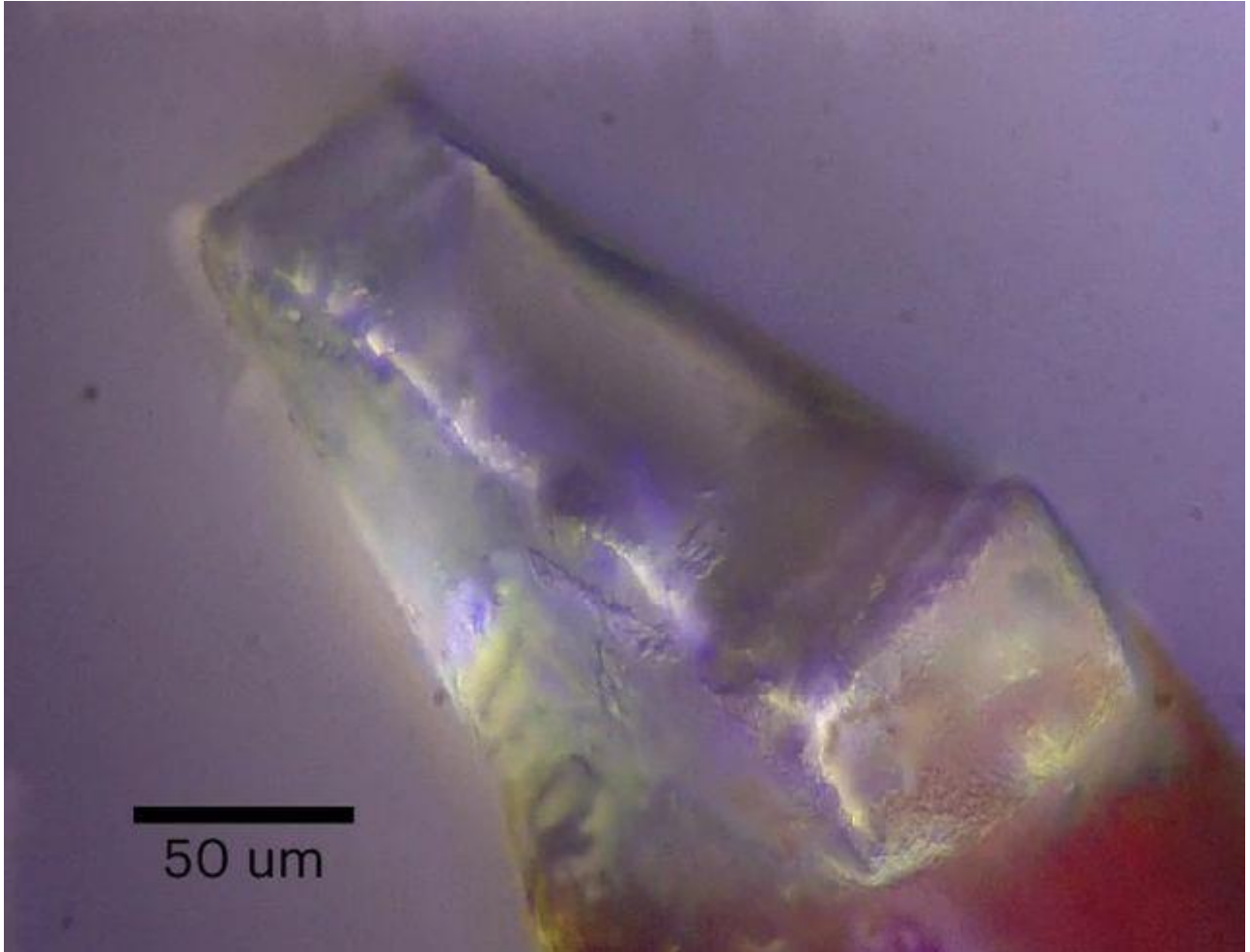
<https://spacenews.com/nasas-inspector-general-predicts-continued-cost-growth-for-sls-mobile-launch-platform/>

<https://spacenews.com/nasa-watchdog-finds-quality-control-problems-with-boeing-sls-work/>

<https://www.space.com/nasa-oig-report-space-launch-system-rocket>

<https://spacenews.com/nasa-assessment-suggests-potential-additional-delays-for-artemis-3-lunar-lander/>

$(\text{NH}_4)\text{MgCl}_3 \cdot 6\text{H}_2\text{O}$



Credit: Jin et al., Nat. Astron., 2024

There's definitely water on the moon, at least at the Chang'e-5 landing site. A team at the Chinese Academy of Sciences has announced that the lunar regolith sample returned to Earth by Chang'e-5 in December 2020 contains a mineral virtually identical to novograblenovite, which was only identified a few years ago in basaltic rock from Russia's Kamchatka Peninsula. Water makes up 41 percent of novograblenovite by weight...

Article: <https://www.sciencealert.com/change-5-mission-discovers-significant-water-rich-mineral-in-moon-soil>

Helium-3 Lunar Mining by 2030?



Credit: Interlune

Apollo 17 astronaut Harrison Schmitt, the only geologist to walk on the moon (so far), is a long-standing champion of lunar mining of Helium-3; he wrote a book about how it might be done. Now he's one of the founders of a company named Interlune that aims to make it happen. The start-up, founded in 2020, only has 20 employees so far, but it aims for a validation mission in 2027, and to have a pilot plant in operation on the moon by 2029.

Article: <https://spacenews.com/interlune-reveals-details-of-quest-to-bring-home-lunar-resources/>

Better Luck Next Time



Credit: NASA/Robert Lea

The first launch by Rocket Factory Augsburg (RFA) was also to have been the inaugural launch from SaxaVord Spaceport, a new spaceport in the Shetland Islands. In early August, major RFA stakeholder OHB said the rocket would launch “in a matter of weeks.” But the first stage blew up on the pad during an engine test on August 19. No more first stage tests or launch attempts for RFA this year. Other European rocket developers, Skyrora and Orbex, also working toward maiden flights from the United Kingdom, may beat RFA to first launch. Or maybe not. Meanwhile, another north European spaceport moved one step closer to first launch. Andøya Spaceport, a Norwegian spaceport located on the island of Andøya north of the Arctic Circle, announced on August 22 that it received a launch license from Norway’s Ministry of Trade, Industry and Fisheries.

Articles: <https://spacenews.com/saxavord-prepares-for-first-orbital-launch/>

<https://spacenews.com/first-rfa-launch-in-a-matter-of-weeks/>

<https://www.space.com/rocket-factory-augsburg-explosion-saxavord-spaceport>

<https://spacenews.com/rfa-pushes-maiden-flight-to-2025-after-launchpad-explosion/>

<https://spacenews.com/norwegian-spaceport-receives-government-license/>

Sail On, Silver Girl



Credit: NASA

NASA's technology demonstrator Advanced Composite Solar Sail System (ACS3), launched into orbit on a Rocket Lab Electron on April 24, has fully deployed its 860-square-foot (80-square-meter) sail. Orbiting at 600 miles (1,000 km), the sail is visible in the night sky, sometimes as bright as Sirius, and can be tracked with a NASA app on your phone.

Articles: <https://www.space.com/nasa-solar-sail-deployment>

<https://www.space.com/nasa-solar-sail-space-photo>

<https://www.space.com/nasa-solar-sail-how-to-see-night-sky>

Something's Gotta Give



Credit: SpaceX webcast

The FAA's Commercial Space Transportation office recently oversaw its 800th commercial launch — Rocket Lab's 'Owl For One, One For Owl' mission. But few people in the industry or in Congress are happy at its licensing pace. Starship's next flight, which they had expected to do this month, will probably not happen until November; the FAA is putting them through more environmental review hoops. This caused not only public complaints from SpaceX, but harsh criticism from Congress. "We are in a bureaucratic soup," said Rep. Haley Stevens (D-Mich.) later in a hearing by the House Science Committee's space subcommittee on September 10. "We know we're not getting to the moon unless we get some commercial spacecraft. So something's not working here." It's not just SpaceX; every other applicant is experiencing long delays. With commercial launches projected to double in the next four years, FAA better figure out something fast.

Articles: <https://spacenews.com/congress-industry-criticize-faa-launch-licensing-regulations/>
<https://spacenews.com/faa-defends-starship-licensing-delays/>
<https://www.space.com/faa-private-launches-double-2028-report>

China's SpaceX Copycat Hits 10 Kilometers



Credit: Landspace

The Chinese company Landspace conducted the first VTVL test of its Zhuque-3 first stage on January 19, lifting itself 1,150 feet (350 m) above its Mongolian desert launch site on a 60 second hop. Now that same test article has made it to 10 km on a 200 second flight. It landed just 1.7 meters from dead center on its landing pad. Landspace has targeted a first orbital flight in 2025 for this Falcon 9-class methalox launcher, with first recovery and reuse of the first stage scheduled for 2026.

Articles: <https://www.space.com/chinese-startup-landspace-reusable-rocket-test-video>

<https://spacenews.com/landspace-completes-10-kilometer-reusable-rocket-test-eyes-2025-orbital-launch/>

This Week At NASA

Videos: <https://www.youtube.com/watch?v=WqPSN-P-y-o&list=PL1D946ACB21752C0E>

That's All, Folks



Credit: SpaceX

