



January 2022

Update

**Oklahoma Space
Alliance**

A Chapter of The
National Space Society

A free email newsletter of the Oklahoma Space Alliance

Thanksgiving Dinner on ISS



January 2022 OSA Meeting

Saturday, January 8, 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

"I think if we operate with extreme urgency, then we have a chance of making life multi-planetary.... If we don't act with extreme urgency, that chance is probably zero." – Elon Musk

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Oklahoma Space Alliance Update

January 8, 2022

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He's Man of the Year, and He's Getting Political



"Person of the Year is a marker of influence, and few individuals have had more influence than Musk on life on Earth, and potentially life off Earth, too," says Time editor in chief and CEO Edward Felsenthal in the statement announcing Elon as Time's Person of the Year. Sen. Elizabeth Warren greeted this news by attacking him on Twitter as a "freeloader"; Musk countered with several withering tweets of his own, and concluded by announcing he'd be paying \$11B in taxes for 2021, and telling Warren "Don't spend it all at once... Oh, wait, you already did." Then he sat down for an interview with The Babylon Bee... Don't mess with Elon.

Articles: <https://www.space.com/elon-musk-time-magazine-person-year-2021>

https://www.theblaze.com/news/jordan-peterson-thank-you-elon-musk-taxes?utm_source=theblaze-dailyPM&utm_medium=email&utm_campaign=Daily-Newsletter_PM%202021-12-21&utm_term=ACTIVE%20LIST%20-%20TheBlaze%20Daily%20PM

https://www.dailywire.com/news/elon-musk-at-its-heart-wokeness-is-divisive-exclusionary-and-hateful?utm_campaign=dw_newsletter&utm_medium=email&utm_source=housefile&utm_content=non_member

https://www.dailywire.com/news/elon-musk-responds-to-elizabeth-warren-spending-thousands-on-facebook-ads-attacking-him?utm_campaign=dw_newsletter&utm_medium=email&utm_source=housefile&utm_content=non_member

JWST is L2-Bound at Last



Only 14 years behind schedule and 2,000% over budget. Bad even by NASA standards. When development of the James Webb Space Telescope began in 1996, launch was initially planned for 2007 and the project had a projected \$500 million budget. There were numerous delays and cost overruns, including a major redesign in 2005. When it finally headed for L2 on December 25, the total cost was over \$10 billion. It will take a month to configure JWST and place it into a halo orbit around the L-2 Lagrange point, 1.5 million km. from Earth. Lots can still go wrong, and unlike Hubble, JWST is not designed to be serviced by astronauts.

Articles: <https://www.space.com/nasa-james-webb-space-telescope-launch-success>

<https://www.space.com/nasa-james-webb-space-telescope-next-steps>

<https://spacenews.com/ariane-5-launches-nasas-james-webb-space-telescope/>

<https://spacenews.com/jwst-launch-marks-only-the-start-of-a-risky-deployment-process/>

Alan Shepard's Daughter Follows Him to Space



When her father made America's first manned spaceflight, Laura Shepard Churchley was 14 years old. On December 11, 60 years later, she made her own spaceflight as one of 6 passengers on Blue Origin's NS-19 flight. It was the third manned flight for the New Shepard spacecraft. Churchley and her crewmates will get the last commercial astronaut wings to be awarded by the FAA, which is retiring them after this flight. Also aboard was Michael Strahan, a former pro football player and currently a TV host for ABC's "Good Morning America." Strahan became the tallest person to fly in space (6'5", 196 cm.); Blue Origin paid him a stipend to fly with them, which he donated to The Boys & Girls Club. Among the 4 paying passengers was space venture capitalist Dylan Tabor. Leonard Nimoy's family commissioned an artist to create a "Live Long and Prosper" necklace to commemorate their father, which was flown by Churchley.

Articles: <https://spacenews.com/blue-origin-launches-first-six-person-new-shepard-suborbital-flight/>

<https://www.space.com/alan-shepard-daughter-laura-excited-space>

<https://www.space.com/blue-origin-michael-strahan-new-shepard-record-launch>

<https://www.space.com/michael-strahan-blue-origin-space-launch-reaction>

<https://www.space.com/laura-shepard-churchley-post-flight-interview>

<https://www.space.com/blue-origin-star-trek-leonard-nimoy-llap-necklace>

It Was Just Getting to Be Too Common

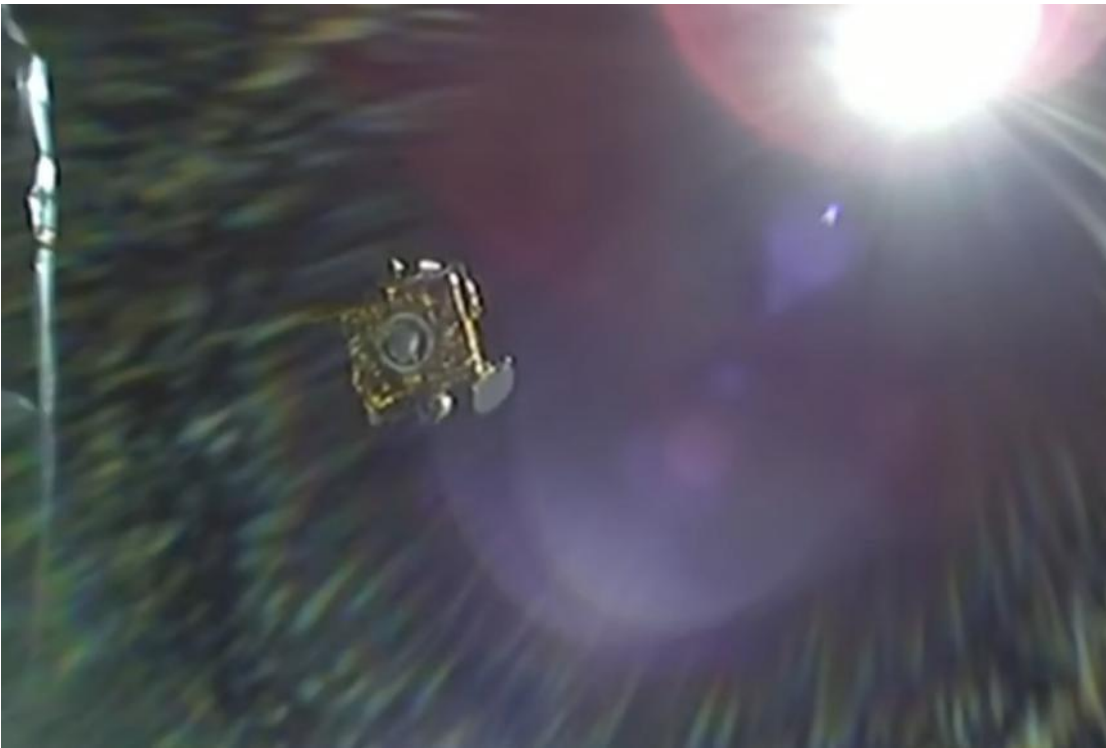


Dec. 10 the FAA announced that it will not award wings to anyone, either crew members or spaceflight participants, that flies on FAA-licensed vehicles after this year. The last such wings to be awarded will be to all non-government individuals that flew on FAA-licensed commercial vehicles in 2021. That includes Sir Richard Branson and all the passengers on the first three New Shepard flights.

Articles: <https://www.space.com/faa-commercial-wings-program-ends-astronauts>

<https://spacenews.com/faa-to-end-commercial-astronaut-wings-program/>

First Asteroid Redirection Test Launched



NASA launched its Double Asteroid Redirection Test (DART) mission on November 23. This is the first real planetary defense test. In September DART, with a relative velocity of 24,000 kph, will direct itself to impact the "moonlet" Dimorphos that orbits the asteroid Didymos. The goal is to shorten its orbit around Didymos by several minutes. Neither the asteroid nor its moon poses any danger of impact with Earth, before or after impact; that's why they were chosen for the test.

Articles: <https://www.space.com/nasa-dart-mission-launch-asteroid-planetary-defense>

<https://spacenews.com/falcon-9-launches-dart/>

Another Irresponsible ASAT Test, This Time by Russia



On November 15 Russia conducted a direct ascent ASAT test targeting a defunct Russian surveillance satellite, Cosmos-1408, in an orbit about 485 km. high. The 2,000 target broke up into 1,700+ trackable pieces of debris and innumerable smaller pieces. The debris will cause a 100% increase in avoidance maneuvers by other satellites for the next few years, an overall increase in collision risk of 5%, and an increase of 7% in the risk that ISS astronauts will have a suit-puncturing hit while on EVA (one spacewalk was postponed while the risk was assessed). ISS crew took precautionary shelter in their capsules for a few hours in the immediate aftermath. Condemnation of Russia poured in from all corners of the globe.

Articles: <https://www.space.com/russia-anti-satellite-test-space-debris-threat-for-years>

<https://spacenews.com/russia-destroys-satellite-in-asat-test/>

<https://spacenews.com/european-space-industry-alarmed-by-russian-asat-test/>

<https://spacenews.com/japan-australia-condemn-russia-for-irresponsible-anti-satellite-missile-test/>

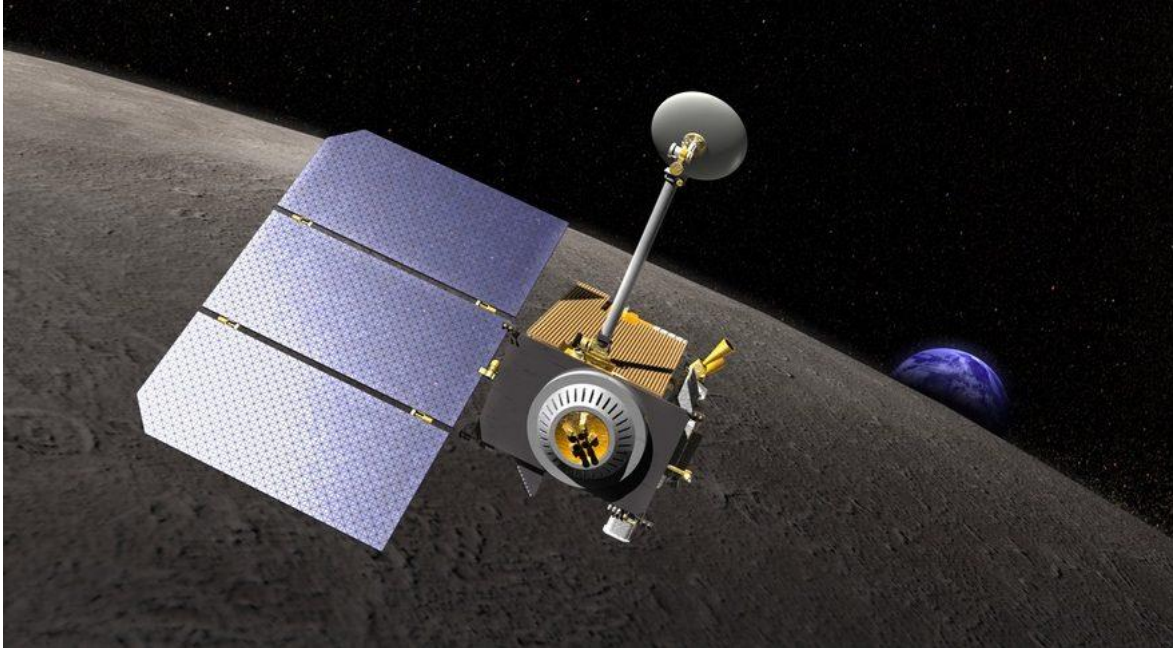
<https://time.com/6117840/astronauts-shelter-iss-russia-test/>

<https://spacenews.com/nelson-and-rogozin-talk-about-asat-test/>

<https://spacenews.com/nasa-postpones-iss-spacewalk-because-of-debris/>

<https://spacenews.com/op-ed-lessons-to-learn-from-russias-nudol-asat-test/>

Even in Lunar Space...



Traffic hazards are coming even as far out as lunar orbit. The Indian Space Research Organisation (ISRO) announced that its Chandrayaan-2 performed a maneuver October 18 to avoid a predicted close approach to our Lunar Reconnaissance Orbiter (LRO) two days later. Chandrayaan-2 had been predicted to come within three kilometers of LRO had it not maneuvered. While several companies are developing debris removal systems, the challenge will be to get owners of debris to give consent to removal. Another challenge is tracking it all. Startup Scout Space recently won a U.S. Air Force SBIR to integrate data from satellites and ground sensors that monitor objects in orbit; its plan is to mount tracking sensors on cubesats.

Articles: <https://spacenews.com/indias-chandrayaan-2-maneuvered-to-avoid-close-approach-to-nasas-lunar-reconnaissance-orbiter/>

<https://spacenews.com/industry-looks-to-simplify-policy-challenges-of-orbital-debris-removal/>

<https://spacenews.com/startups-developing-space-traffic-monitoring-system-to-help-manage-growing-debris-problem/>

NASA's New Astronaut Class



NASA announced on December 6 that it has chosen 10 new astronaut candidates from a field of more than 12,000 applicants. They will report for duty at Johnson Space Center this month to begin two years of training. For the first time ever, NASA required candidates to hold a master's degree in a STEM field and used an online assessment tool. With the addition of these 10 members of the 2021 astronaut candidate class, NASA now has selected 360 astronauts since the original Mercury Seven in 1959.

NASA Press Release: <https://www.nasa.gov/press-release/nasa-selects-new-astronaut-recruits-to-train-for-future-missions>

China's Space Station Long-Duration Mission



The Shenzhou-13 mission, launched on October 15, 2021, aims to double the three-month record of Shenzhou-12. Six-month rotations aboard the Tiangong space station will be the norm, going forward. So far, the crew has conducted two six-hour spacewalks to install equipment on the exterior of the station. The first, on November 7, saw Wang Yaping become China's first female spacewalker. Mission commander Zhai Zhigang (a major general in the PLA) participated in both spacewalks; the second was on December 26, with rookie taikonaut Ye Guangfu. As on her first spaceflight on Shenzhou-10, Wang broadcast a live lesson to China's schoolchildren. The entire Shenzhou-13 crew participated in this one on December 9. They connected directly with 1,420 students on Earth in five classrooms across China in Beijing, Guangxi Zhuang Autonomous Region, Sichuan Province, Hong Kong and Macao with the support of relay satellites. Tens of millions more followed the 60-minute-long class through live broadcasts. This is intended to be the first of many classes from the space station to inspire Chinese youth. China plans to complete the station with six more missions in 2022.

Articles: <https://www.space.com/china-tiangong-space-station-astronauts-science-lesson>
<https://www.space.com/chinese-astronaut-wang-yaping-earth-space-station-photos>
<https://www.nasaspacesflight.com/2021/11/first-chinese-woman-spacewalk/>
<https://www.space.com/china-astronauts-second-spacewalk-shenzhou>
<https://spacenews.com/china-aims-to-complete-space-station-in-another-huge-year-in-space/>
<https://www.space.com/china-live-stream-new-space-station>

Practice for dearMoon



On December 8, Japanese billionaire Yusaku Maezawa, video producer Yozo Hirano and cosmonaut Alexander Misurkin arrived aboard ISS for a 12-day stay after launch aboard a Soyuz from Baikonur. Maezawa and Hirano shot several videos during their stay, and returned to Earth on December 19. This is the first space tourist flight arranged by Space Adventures since 2009; the retirement of the Shuttle in 2011 meant all Soyuz seats had to be reserved for ISS crew. Maezawa plans to ride a Starship around the Moon in a project called dearMoon, still tentatively scheduled for 2023.

Articles: <https://www.space.com/yusaku-maezawa-space-tourist-arrives-iss>
<https://spacenews.com/soyuz-launches-japanese-private-astronauts-to-iss/>
<https://www.cnn.com/2021/12/07/tech/space-tourism-maezawa-soyuz-scn/index.html>
<https://www.space.com/yusaku-maezawa-space-tourist-videos-iss>
<https://www.cnbc.com/2021/12/08/japanese-billionaire-yusakua-maezawa-arrives-at-iss.html>

New Russian Module on ISS

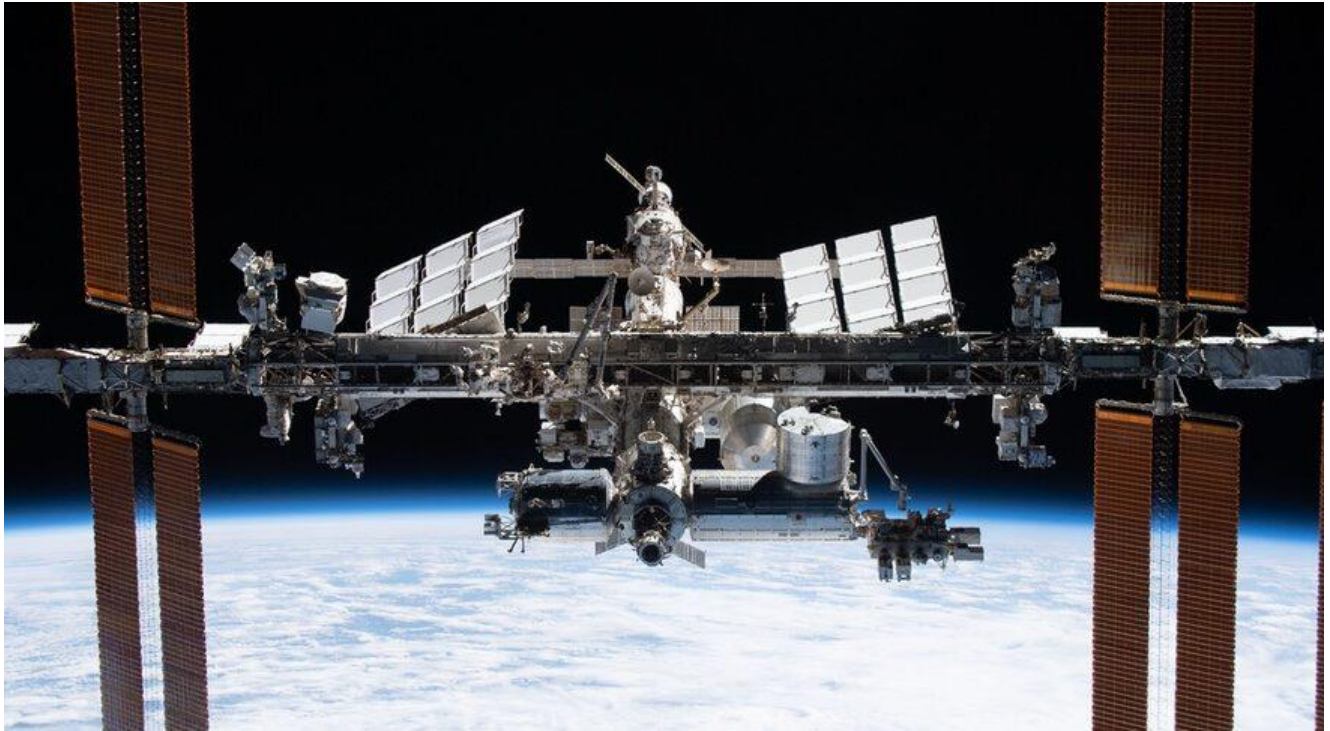


A Soyuz rocket carrying a modified Progress cargo spacecraft and a new Russian docking module lifted out of Baikonur on November 24. It docked with ISS two days later. The 4-ton, spherical Prichal (Russian for "pier") has about 494 ft³ (14 m³) of pressurized volume. It has six docking ports. Prichal is docked to the Nauka module, launched on July 2021, 2021. Nauka is attached to the nadir port of the Zvezda module, replacing the Pirs docking module. Prichal will attach to the nadir port of Nauka. To complete the integration of the Prichal into the Russian segment of ISS, cosmonauts Anton Shkaplerov and Pyotr Dubrov will perform a spacewalk, scheduled for January 19, to install cables between Nauka and Prichal. In addition to hosting Soyuz and Progress visitors, two of the ports are planned to be used to attach two large modules to be launched in the mid-2020s.

Articles: <https://www.space.com/russia-prichal-space-station-module-launch-success>

<https://spacenews.com/russian-node-module-docks-with-iss/>

ISS Extended to 2030



"I'm pleased that the Biden-Harris administration has committed to continuing station operations through 2030," said NASA Administrator Bill Nelson in a statement posted to NASA's website on December 31. Still to be secured is agreement from all the international partners. ESA and Japan will be no problem; Russia is a bigger question mark. In addition to increasing tension between the US and Russia, Roscosmos head Dmitry Rogozin has expressed doubts that increasing technical failures and malfunctions on the Russian side of ISS will render occupation past 2024 questionable. Russia has also made noise about establishing a separate national space station. NASA's Office of Inspector General (OIG) issued a report on November 30 noting with concern air leaks on the Zvezda module and stating that any gap between the retirement of the ISS and debut of commercial stations would increase risk for future human deep space missions and threaten the collapse of the LEO commercial space economy. On December 2, NASA awarded \$400M+ to three space station teams as part of its Commercial Low Earth Orbit Destinations (CLD) program to make sure there is no gap.

Articles: <https://spacenews.com/white-house-commits-to-iss-extension/>

<https://www.space.com/white-house-international-space-station-2030-extension>

<https://spacenews.com/nasa-inspector-general-warns-of-space-station-gap/>

<https://spacenews.com/nasa-awards-funding-to-three-commercial-space-station-concepts/>

It Was Inevitable



NASA, bowing to reality, now admits that 2024 is an infeasible date for the return to the moon. In a media teleconference on November 9, NASA Administrator Nelson said part of the delay is due to Blue Origin's now-dismissed legal challenge to NASA's selection of SpaceX for the Human Landing System. That challenge prevented NASA from having any contact with SpaceX regarding the HLS contract for seven months. But the larger reason is that Congress has consistently underfunded HLS. In its FY 2021 budget proposal (the last one submitted by the Trump administration) NASA requested \$3.3 billion for HLS and got only \$850 million from Congress. Artemis 3, the first landing mission, has been pushed back from 2024 until at least 2025. The Artemis 2 circumlunar flight has also been delayed from 2023 to 2024. NASA's OIG estimates the total cost of Artemis at \$93B through 2025, and a single SLS Orion launch is priced at \$4.1B.

Articles: <https://spacenews.com/nasa-delays-human-lunar-landing-to-at-least-2025/>

<https://www.space.com/nasa-artemis-moon-program-93-billion-2025>

It's Hot! It's Damn Hot!



Observations from Parker Solar Probe's April 28 flyby (its 8th) show that the spacecraft managed to get inside the sun's corona (i.e. the solar atmosphere) for the first time. Perihelion on this pass was just 15 solar radii from the sun's surface. Parker will edge even closer on upcoming flybys – the next one will be in late February – eventually dipping as low as 8.86 solar radii (3.83 million miles or 6.16 million km) from the sun's photosphere, its visible surface. Parker is the fastest man-made object in history, flying at about 447,000 mph (720,000 kph) at perihelion. At this speed, impacts by tiny dust grains raise clouds of plasma from its shield. "During its ninth orbit of the sun, of 24 total planned orbits, there were periods where the Parker Solar Probe was struck by a hypervelocity dust grain every 12 seconds on average," said David Malaspina, a space plasma physicist at the University of Colorado, Boulder.

Articles: <https://www.space.com/dust-impacts-parker-solar-probe-plasma-explosions>

<https://www.space.com/parker-solar-probe-touches-sun-atmosphere>

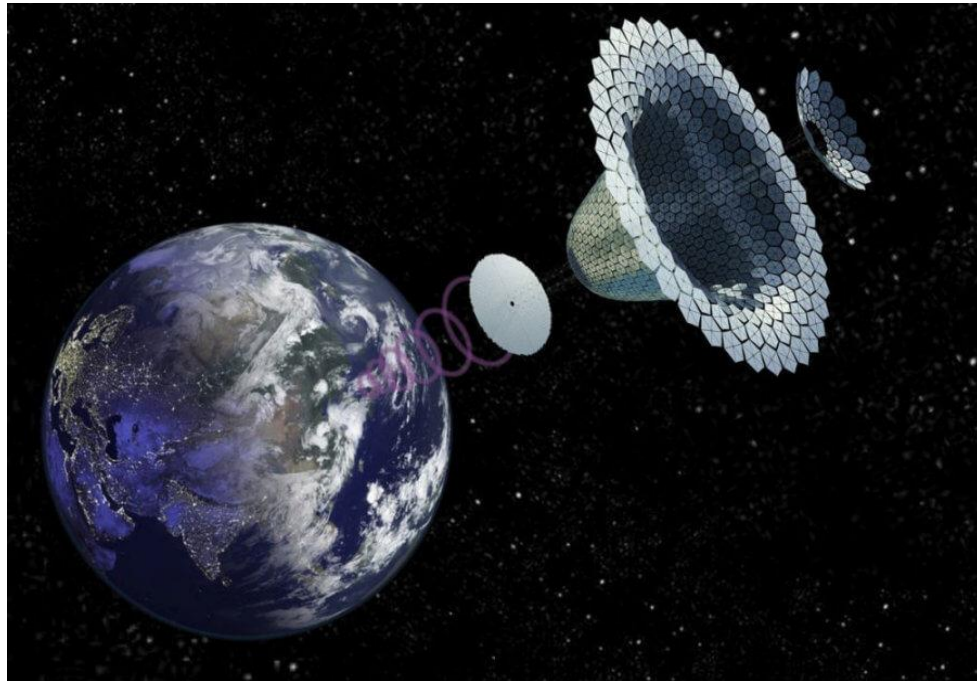
First National Space Council Meeting for the Biden Administration



At the first meeting of the Biden administration’s National Space Council December 1, Vice President Kamala Harris said efforts to establish “rules and norms for responsible behavior in space” will be one of three main priorities for the council, along with using space to help combat climate change and expanding STEM education. The Russian ASAT test figured prominently in the discussion; they’d like to see a global ban of ASAT tests (good luck with that). Military issues will be front and center whether the Biden administration wants them to be or not. U.S. National Security Advisor Jake Sullivan said the National Security Council will start developing “new proposals for international norms that contribute to stability and security in space while also protecting the space environment.” A seven-page [United States Space Priorities Framework](#) document released ahead of the meeting, long on “the big picture” but short on specifics, also endorsed continued development of civil space traffic management (STM) capabilities.

Articles: <https://spacenews.com/white-house-releases-space-priorities-framework/>
<https://spacenews.com/biden-administration-turns-focus-to-space-security/>
<https://spacenews.com/space-council-condemns-irresponsible-russian-asat-test/>

New NSS Position Paper on Space Solar Power



“Mass production of SSP modules combined with fully reusable, very large launchers in flight test today are changing the playing field. The potential of a two orders of magnitude cost reduction in the most expensive parts of a spacecraft, launch and manufacture, means the business case for SSP may at long last be closing,” says NSS’ latest position paper on SSP, released in November. “The next step is to convert interest into research, development, and—when ready—deployment of SSP. The NSS position paper A Public/Private COTS-Type Program to Develop Space Solar Power, January 2020, calls for immediate new funding for SSP. Additionally, the National Space Society endorses the Defense Department funded SPS research referred to in the Alliance for Space Development 2021 objectives.”

Paper: <https://space.nss.org/wp-content/uploads/NSS-Position-Paper-SSP-Clean-Energy-from-Space-2021.pdf>

Don't Panic



Construction began in early December on a launch pad for Starship at KSC's Launch Complex 39A, but Starship needs a LOT of engines – 33 for the first stage and 6 for the upper stage. Production isn't ramping up fast enough to suit Musk, who used the B word in an internal SpaceX email sent to all employees over Thanksgiving weekend. Musk described the Raptor production situation as a "crisis" that is "much worse than it had seemed a few weeks ago." He announced he was foregoing a planned Thanksgiving weekend break to work on the Raptor production line and implored all SpaceX employees to join him if they could. "Unless you have critical family matters or cannot physically return to Hawthorne, we will need all hands on deck to recover from what is, quite frankly, a disaster," he said. "What it comes down to is that we face a genuine risk of bankruptcy if we can't achieve a Starship flight rate of at least once every two weeks next year," because Starship is needed to launch the bigger next generation of Starlink satellites. That's worst case, but good CEOs always run scared.

Articles: <https://www.space.com/starship-engine-crisis-spacex-elon-musk>
<https://spacenews.com/spacex-grapples-with-raptor-production-problems/>
<https://www.space.com/spacex-building-starship-launch-pad-florida>

This Week At NASA

Videos: https://www.nasa.gov/multimedia/podcasting/twan_index.html
https://www.youtube.com/watch?v=_pzt9c0yKco
https://www.youtube.com/watch?v=3xbRfU_kAlM
<https://www.youtube.com/watch?v=bw79tvdiARl>

That's All Folks

