

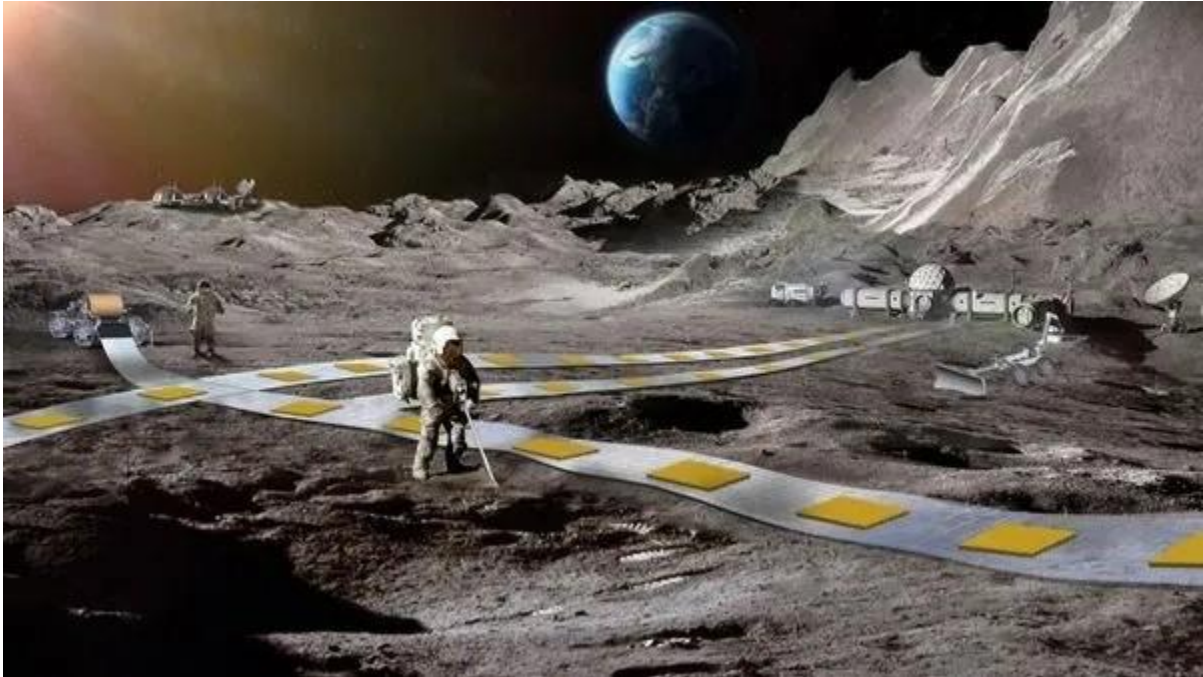
Beyond the Booster: Navigating the Hazards of Upper Stages



Upper rocket stages face high failure rates due to their complexity and the harsh conditions they operate in, leading to significant mission risks. Several incidents in 2023, such as those with Firefly Aerospace's Alpha rocket and Rocket Lab's Electron, highlight issues like dislodged filters and electrical arcs. Diagnosing these failures is challenging due to intricate designs and operational demands, as well as the difficulty of replicating upper stage flight conditions for testing on Earth. These incidents emphasize the need for rigorous testing and quality control to ensure mission success and minimize orbital debris.

<https://spacenews.com/unforgiving-failures-the-challenges-of-upper-stages/>

All Aboard the Lunar Express: NASA and DARPA's Moon Rail Innovations

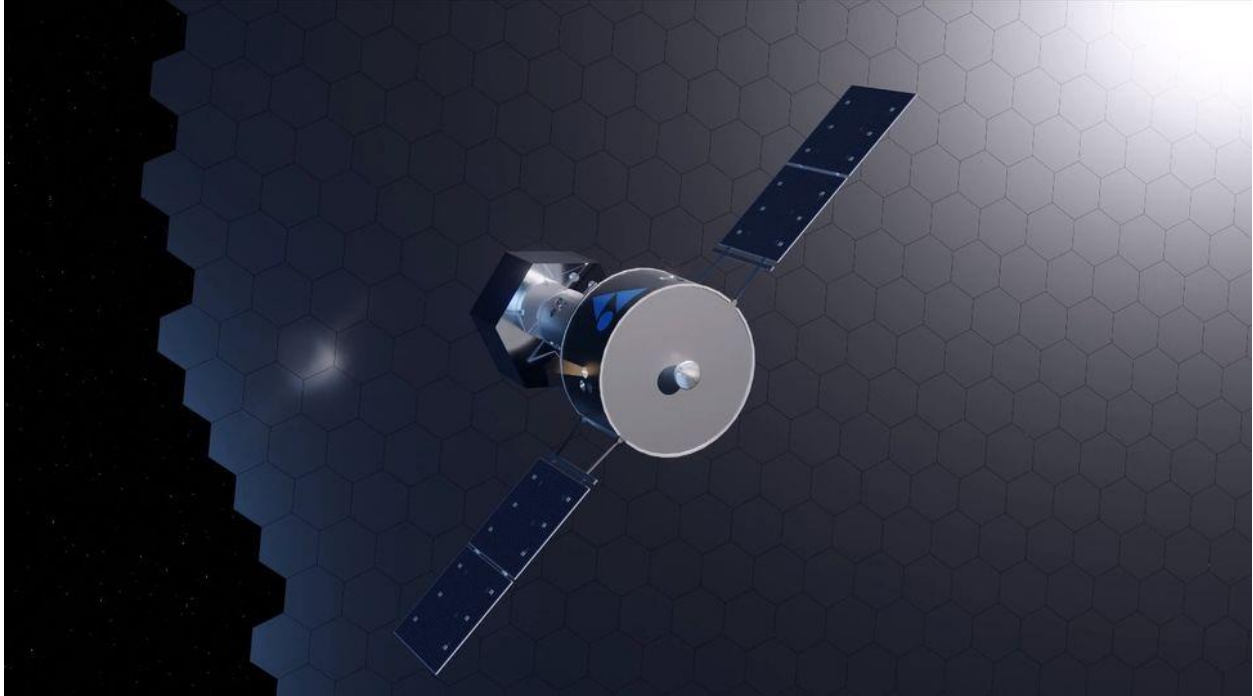


NASA and DARPA are developing innovative lunar transportation systems to support long-term moon exploration. NASA's levitating robotic moon train will use magnetic levitation to move cargo efficiently across the lunar surface, reducing wear and tear without the need for tracks. DARPA has selected Northrop Grumman to create a "lunar railroad" that aims to transport humans, supplies, and resources on the moon. These systems will enhance lunar infrastructure, enabling sustainable exploration and habitation.

<https://www.space.com/darpa-northrop-grumman-moon-railroad>

<https://www.space.com/nasa-levitating-robotic-moon-train>

Sun Catchers in Orbit: SpaceX and Virtus Solis Illuminate Earth



Virtus Solis is planning on utilizing SpaceX's Starship to deploy solar power satellites into a Molniya orbit, characterized by a high inclination and eccentricity, providing prolonged periods of sunlight and optimal ground visibility. These satellites will capture solar energy and convert it into microwaves for transmission to Earth-based rectennas. This orbit allows the satellites to maximize energy collection and transmission efficiency, especially for higher latitude regions. The Starship's heavy-lift capability is essential for deploying the large, modular solar power units required for this innovative space-based solar power project. It's not entirely clear why Virtus Solis is choosing a Molniya orbit over a more traditional geostationary orbit.

<https://www.space.com/spacex-starship-solar-power-beaming-virtus-solis>

Safe Landing, Unsolved Issue: Blue Origin's Parachute Challenge

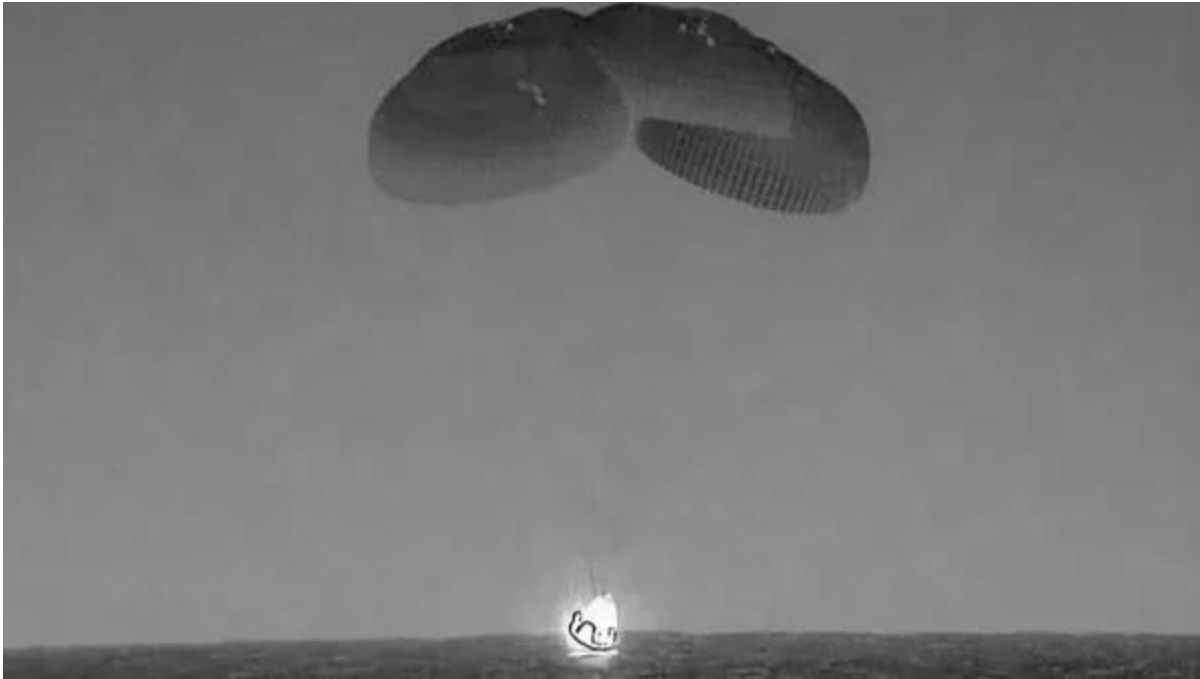


Blue Origin is investigating an issue with one of the three parachutes on its New Shepard rocket, which occurred during a recent flight. Despite the problem, the capsule landed safely with the remaining parachutes. This investigation is crucial as Blue Origin begins resuming regularly crewed flights. Similar parachute issues have affected other manufacturers, including SpaceX and Boeing, highlighting the importance of robust parachute systems for safe spaceflight.

Blue Origin, SpaceX (more to come), and Boeing have all used Airborne Systems to manufacturer their parachutes.

<https://spacenews.com/blue-origin-investigating-new-shepard-parachute-issue/>

Vertical Integration Victory: SpaceX Buys Pioneer Aerospace for \$2.2 Million



SpaceX has acquired Pioneer Aerospace, a manufacturer specializing in parachute systems, for \$2.2 million after its parent company, Aviation Safety Resources, filed for bankruptcy. This acquisition aims to secure and enhance SpaceX's supply chain for its Dragon spacecraft, which relies on advanced parachute technology. Parachutes pose significant challenges, as noted by NASA officials, and this move ensures SpaceX can maintain high standards for crewed and uncrewed missions. This acquisition reflects the tendency of SpaceX to pursue vertical integration, and a potential effort for SpaceX to move away from Airborne Systems as their parachute manufacturer.

<https://www.space.com/spacex-buys-parachute-manufacturer-pioneer-aerospace>

Cargo Capsules on Call: Inversion Space's Vision for Space-Based Warehousing



Inversion Space is developing "warehouses in space" using reusable reentry capsules to store and deliver cargo quickly to any location on Earth. Aimed at the U.S. Department of Defense, this concept emphasizes rapid, precise, and autonomous cargo delivery. The company's pathfinder mission, "Ray," will launch on a SpaceX rideshare mission in October 2024 to test key technologies. These capsules are designed to be compatible with various launch vehicles, offering a flexible logistics solution for military and commercial applications.

<https://spacenews.com/inversion-space-targets-military-market-with-warehouses-in-space/>

Trojan Treasure: Lucy's Flyby Reveals Dinkinesh's Moon



NASA's Lucy spacecraft conducted a flyby of asteroid Dinkinesh as an engineering test to ensure the spacecraft's systems function correctly for its primary mission. During the test, Lucy discovered that Dinkinesh has a moon named Selam, which was discovered to be a contact binary. The mission aims to study Trojan asteroids near Jupiter, providing insights into the solar system's formation and evolution. Future goals include multiple flybys of these asteroids to gather detailed data on their composition and geological history. <https://www.space.com/nasa-lucy-lpsc-dinkinesh-selam-asteroids>

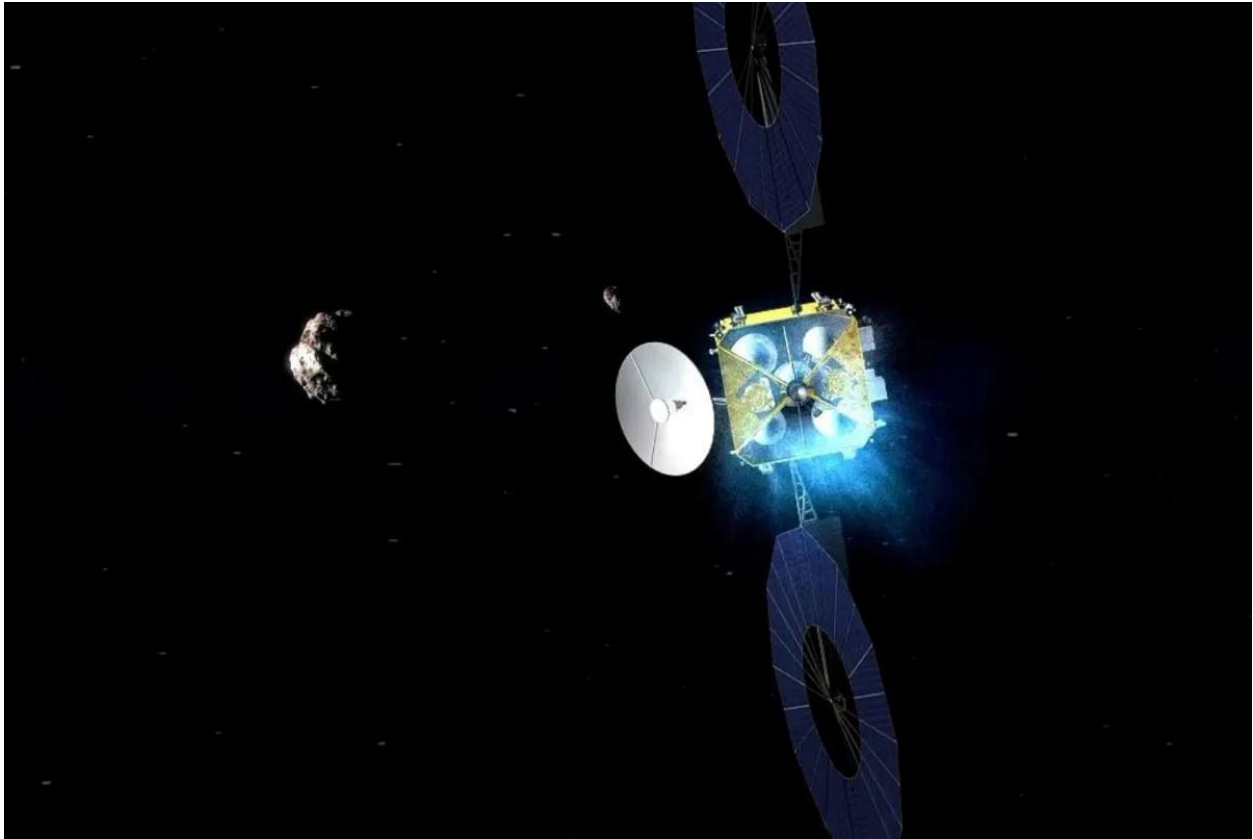
China's Space Ambitions: Legal Frameworks and Lunar Prospects



China has asserted that its space resource utilization activities are legal under the 1967 Outer Space Treaty in a submission to the United Nations. The submission underscores adherence to international law, sustainability, and cooperation, but also emphasizes China's strategic interests in space, including lunar exploration and the proposed International Lunar Research Station. While promoting international consensus, China's position could be seen as a strategic maneuver to legitimize and advance its own ambitious space agenda, potentially positioning itself as a dominant player in future space resource extraction and utilization.

<https://spacenews.com/china-outlines-position-on-use-of-space-resources/>

China's Plans for "Low-Cost, High-Frequency" Asteroid Missions



Chinese scientists are advocating for a stronger focus on asteroid missions, emphasizing their importance for planetary defense and space resource utilization. They propose low-cost, high-frequency sample return missions to enhance understanding and strategic capabilities. These missions could identify and mitigate asteroid threats to Earth while harnessing valuable space resources. The Tianwen-2 mission, set for 2025, aims to return samples from the near-Earth object 469219 Kamo'oailewa, highlighting China's commitment to advancing both scientific knowledge and strategic interests in space.

<https://spacenews.com/chinese-scientists-call-for-focus-on-asteroid-missions/>

The Launchpad Beauty Contest Winner!



Norway has inaugurated its first operational orbital spaceport, Andøya, located within the Arctic Circle. This new spaceport aims to address Europe's limited launch capabilities and enhance strategic autonomy. It features multiple launch pads, with Isar Aerospace having exclusive access to the first pad for its Spectrum launch vehicle. The opening of Andøya marks a significant milestone for Norway and the European space industry, facilitating satellite launches from European soil and positioning Andøya as a key player in the global space sector.

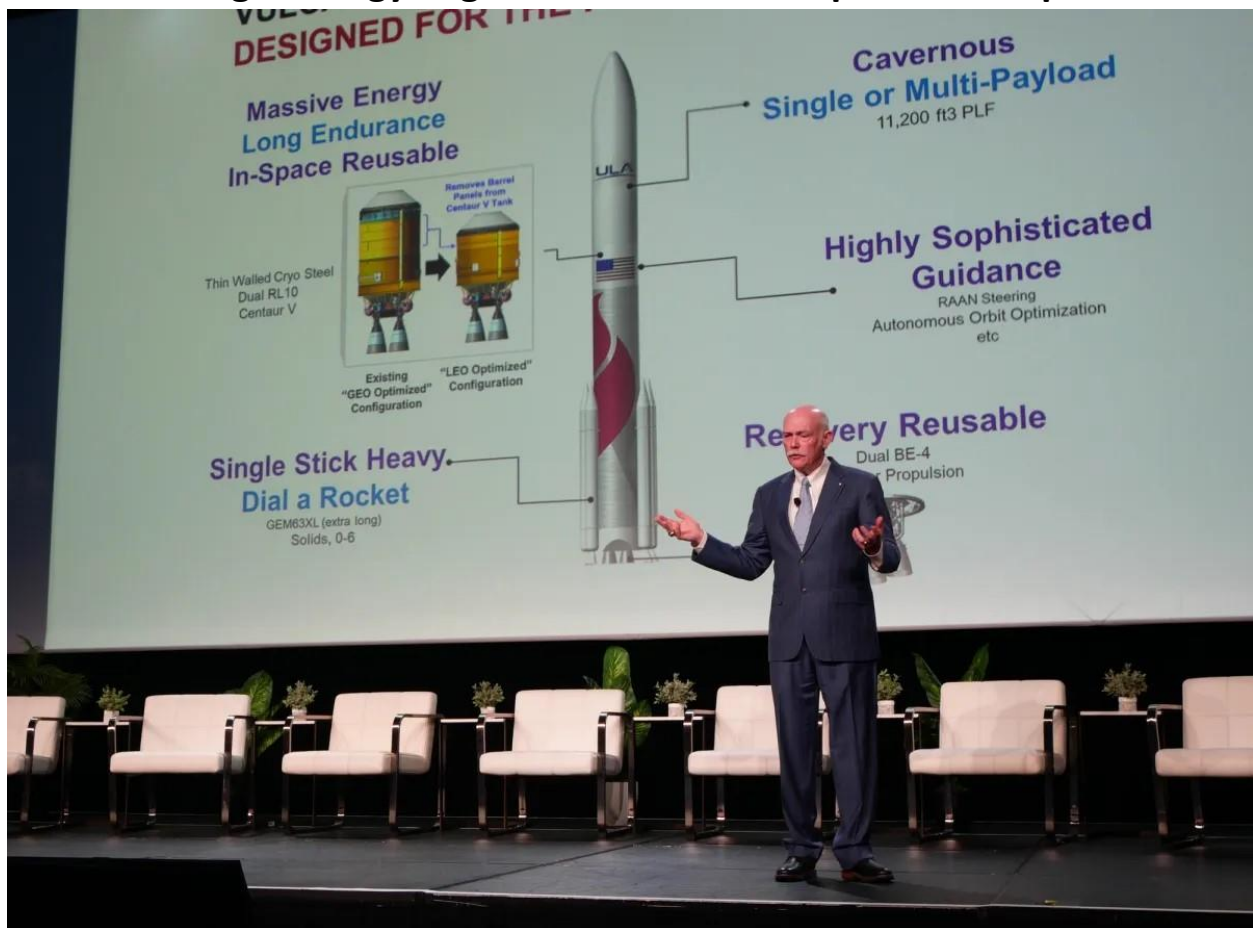
<https://spacenews.com/norway-opens-andoya-spaceport/>

From Desert to Orbit: Inland Spaceports Eye the Stars



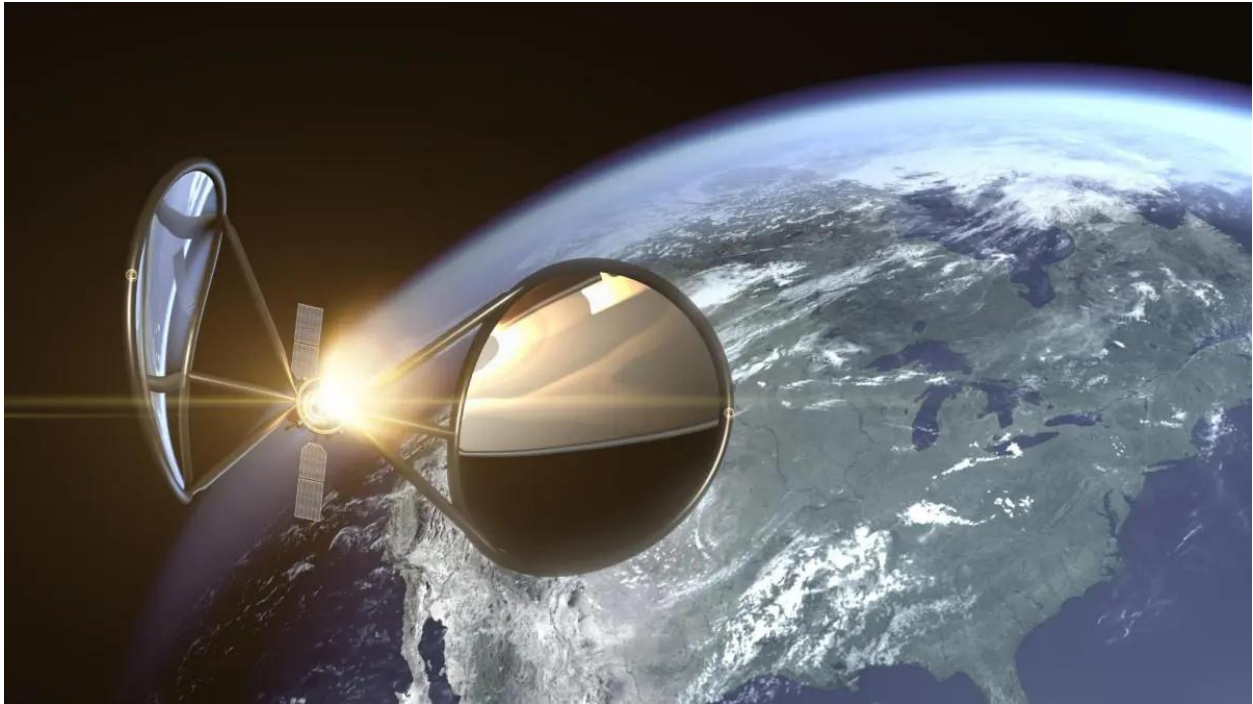
Inland spaceports in the U.S. are striving to host orbital launches to alleviate congestion at major coastal sites like Cape Canaveral and Vandenberg. With commercial launch licenses tripling in recent years, these inland sites face challenges such as safety concerns over populated areas and lack of established infrastructure. Spaceport America in New Mexico is leading efforts by proposing a \$2 million "Orbital Launch Challenge" prize to incentivize companies to achieve orbital launches from their facility. The success of these inland spaceports depends on developing advanced safety systems and possibly favoring horizontal launch methods initially. This shift aims to provide more flexibility and capacity in the growing commercial space launch market <https://spacenews.com/inland-spaceports-seek-ways-to-host-orbital-launches/>

Vulcan's High-Energy Edge: ULA's Secret Weapon in the Space Race



United Launch Alliance (ULA) CEO Tory Bruno emphasized the importance of high-energy missions for the company's future, particularly in the context of National Security Space Launch (NSSL) contracts. Speaking at the SpaceCom conference, Bruno highlighted that the successful inaugural launch of the Vulcan rocket underscored ULA's capability to deliver on these demanding missions. He noted, "When Atlas flies out in about a year, this will be the only high-energy rocket left in the world," indicating Vulcan's unique ability to serve "the most critical and important missions, unique missions, for national security." Bruno further explained that high-energy missions, such as those requiring direct injection of payloads into geostationary orbit, will constitute a growing portion of NSSL Phase 2 and Phase 3 contracts. He argued that ULA's approach makes them more cost-effective for these missions, stating, "We run about 34% cheaper on a high-energy mission than the other one, SpaceX, does." This strategic focus on high-energy capabilities is a key differentiator for ULA in securing and executing national security contracts <https://spacenews.com/bruno-trumpets-transformation-of-ula-after-vulcan-launch/>

From Stealth to Stellar: Portal's Supernova Blazes New Trails in Satellite Propulsion



Portal Space Systems, led by Jeff Thornburg, a former senior director at SpaceX, has unveiled its innovative spacecraft, Supernova, which promises to revolutionize satellite mobility with its solar-thermal propulsion technology. This propulsion system will allow the Supernova to maneuver far more effectively than current satellites, providing over 50 times the mobility improvement. Thornburg emphasized that while the aerospace industry has advanced in other areas, satellite bus technology has remained stagnant. Portal aims to change this by offering a spacecraft that can rapidly transition between orbits, including from low Earth orbit (LEO) to geostationary orbit and even to lunar vicinity, in a matter of hours or days. This capability is particularly appealing for national security missions, as it allows real-time responsiveness in any orbital regime <https://www.space.com/portal-space-systems-startup-out-of-stealth-mode>

<https://spacenews.com/portal-space-systems-unveils-plans-for-highly-maneuverablespacecraft/>

Additional Information:

<https://www.linkedin.com/pulse/airborne-systems-welcomes-home-spacex-crew-5-airbornesystems> <https://airborne-sys.com/experience/space-systems/>

<https://x.com/StephenClark1/status/1792214617189417362>