Beyond Earth: Deep Research on the Most Important Breakthroughs and News in Space and Aerospace from the Past 7 Days

(Report Date: November 13, 2025)

1. Introduction: A New Era of Access and Sovereignty

The period of November 6-13, 2025, marks a critical inflection point for the "Beyond Earth" economy. The dominant theme of the week is one of bifurcation: while commercial access to deep space is being technologically validated and fundamentally reshaped by new entrants, a parallel "gold rush" is accelerating on Earth as nations seek to establish sovereign, domestic orbital infrastructure.

This report analyzes the three dominant, interconnected stories of the week. First is the profound technological validation of Blue Origin's New Glenn heavy-lift vehicle, which successfully completed its second flight and, crucially, its first-ever reusable booster landing, signaling the end of the market monopoly on reusable heavy lift.[1] Second is the strategic inauguration of the Orbitworks satellite factory in Abu Dhabi, a move that provides a new blueprint for sovereign space capability through innovative public-private partnerships.[2]

Finally, these advancements are set against a backdrop of significant new headwinds, particularly in the United States. The U.S. space sector now faces a deepening crisis in its civil space governance, as the office tasked with critical space traffic management (the Office of Space Commerce) faces budgetary collapse.[4] Simultaneously, the entire defense industrial base is being subjected to a new, burdensome, and costly cybersecurity compliance regime (CMMC) that became effective this week.[5]

We are witnessing the simultaneous maturation of commercial spaceflight into a utility and the strategic fragmentation of the global space order. Technology proliferation, driven by commercial entities, is enabling a new era of strategic, sovereign competition, fundamentally

altering the geopolitical and economic landscape of space.[7]

2. Technological Breakthroughs: Applied Capabilities and Future Needs

While no new fundamental research and development was announced this week, the "breakthrough" lies in the operational, full-scale validation of advanced technologies. This section analyzes the technologies demonstrated in this week's missions, set against the backdrop of future requirements for a sustainable "Beyond Earth" presence.

2.1 Propulsion - The Reusable Methane Engine Era Begins

The most significant technological event of the week was the successful flight and subsequent autonomous landing of Blue Origin's New Glenn first stage.[1] This event provides the first full-mission validation for its BE-4 methalox engines in a reusable architecture. This is the first engine to prove it can compete with SpaceX's Raptor in a reusable, deep-space-capable launch system.

This success in chemical propulsion is a critical, market-defining step for the current generation of space infrastructure. However, it remains an incremental improvement. The true "Beyond Earth" vision—specifically, rapid human transit to Mars—requires a paradigm shift in propulsion technology. As extensive research confirms, cutting the 9-month chemical-propulsion trip to Mars down to 3 months is a mandatory requirement, not a preference, to limit astronaut crews' exposure to debilitating solar and cosmic radiation.[9]

This level of performance is unattainable with any chemical rocket, including methane. It is achievable only through the application of Nuclear Thermal Propulsion (NTP) or, potentially, advanced high-power electric propulsion systems like the Variable Specific Impulse Magnetoplasma Rocket (VASIMR).[9]

Therefore, the BE-4's success this week is a "here and now" solution that secures the *commercial* and *robotic* deep-space launch market for the next decade. It validates the next-generation strategy for both Blue Origin and United Launch Alliance (which also uses the BE-4 on its Vulcan rocket). The strategic research and development focus for human exploration, however, must remain fixed on maturing NTP and advanced electric systems for

the crewed Artemis-era goals.[12]

2.2 Autonomy - The GNC Challenge of Landing a 60m Booster

The successful landing of the 60-meter-tall New Glenn first stage on the autonomous recovery ship *Jacklyn* was a monumental achievement in guidance, navigation, and control (GNC).[1] The system was required to autonomously manage a series of complex engine burns, steer the vehicle at hypersonic and supersonic speeds using grid fins, and execute a precise terminal guidance burn to a moving, uncrewed platform at sea.

This GNC capability is a direct technological descendant of the autonomous systems proven on NASA's Mars rovers, such as Curiosity and Perseverance, which use AI-powered navigation to analyze terrain and plan routes independently.[13] This same core technological competency is foundational for *all* future "Beyond Earth" economic activity.

The autonomous GNC developed for landing a rocket is a "gateway technology" for the autonomous GNC required for in-space operations. A rocket landing is a high-speed, high-stakes robotics problem. In succeeding, Blue Origin has demonstrated that its AI-driven control system is robust and capable. This exact same competency is the primary prerequisite for autonomous rendezvous and proximity operations (RPO). RPO, in turn, is the enabling technology for the entire in-orbit logistics and servicing market, including satellite life extension, in-space assembly, active debris removal, and on-orbit refueling.[14]

Blue Origin's success on November 13, therefore, is not merely about reusability and cost-savings. It is a powerful, public demonstration of its core capability to compete in what many analysts believe will be the next trillion-dollar market: in-orbit logistics.

2.3 Materials and Manufacturing - Validating Structures for Reusability

The New Glenn booster's survival of the extreme thermal and mechanical stresses of launch and atmospheric re-entry demonstrates the maturity of its structural alloys and thermal protection systems. This success, however, represents the pinnacle of the "traditional" manufacturing paradigm: building massive, monolithic, complex structures on Earth designed for robust reuse.

This "old" (though newly perfected) paradigm is being complemented by a revolution in

on-demand, in-space manufacturing. NASA is actively testing advanced 3D printing on the International Space Station (ISS) to create on-demand tools and parts, a critical capability for long-duration missions far from Earth's supply chain.[17] Commercial entities like Redwire (formerly Made In Space) are pioneering orbital factories for producing high-value goods like optical fiber and bioprinted pharmaceuticals in microgravity.[18] Concurrently, advanced 3D-printing materials like Windform XT 2.0 are already space-qualified and being used to print entire small-satellite structures.[19]

The future "Beyond Earth" infrastructure, such as the Lunar Gateway, will not be "launched" in its final form.[20] It will be *assembled* in orbit.[21] The true architecture of the future will fuse both paradigms: reusable heavy-lift rockets, like the New Glenn, will be used to launch the *factories* (the robotic assemblers, 3D printers, and raw material feedstock [15]) that will then construct the final, large-scale infrastructure (like refueling depots or kilometers-wide solar power stations) in space.

3. Commercial & Mission Developments: The Heavy-Lift Race Reshapes

3.1 Analysis: Blue Origin Enters the Arena, Validates New Science Model

On November 13, 2025, Blue Origin's New Glenn rocket successfully launched NASA's twin ESCAPADE probes on a trajectory toward Mars.[1] The launch, which had been scrubbed earlier in the week due to cumulonimbus clouds (November 9) and an intense solar storm (November 12), was the rocket's second-ever flight.[22]

The primary breakthrough of the mission was the first-ever successful landing of the New Glenn's reusable first-stage booster on the *Jacklyn* recovery ship.[1] This single event is the most significant strategic development in the launch sector this year. It officially ends the functional monopoly on domestic, reusable heavy-lift that SpaceX has held for the past five years.

This development creates an immediate *reusable heavy-lift duopoly*. This injects immediate and intense price and capability competition for all high-value national contracts, most notably NASA's Human Landing System (HLS) for the Artemis program and the DoD's

multi-billion-dollar National Security Space Launch (NSSL) manifest.[20]

Furthermore, the mission's payload is itself a pathfinder. The ESCAPADE mission, consisting of two probes built by Rocket Lab for the University of California, Berkeley, cost less than $80 million.[1] It is a trailblazer for a new class of low-cost, commercially-launched interplanetary science. This mission proves a new model for NASA: instead of relying exclusively on multi-billion-dollar "flagship" missions that launch once per decade, the agency can now leverage this new commercial heavy-lift capacity to launch "squadrons" of small, $80M-class probes, dramatically increasing the cadence and risk-tolerance of deep-space exploration.

3.2 Analysis: The Relentless Pace of LEO Access & GEO Deployment

The week's full launch manifest demonstrates the maturation and clear segmentation of the modern launch market.

1. **Dedicated Small Launch:** On November 6, Rocket Lab successfully launched its Electron rocket for the 'The Nation God Navigates' mission. It deployed the QPS-SAR-14 ('Yachihoko-1') satellite for the Japanese Earth-imaging company iQPS into a precise 575 km orbit.[26]
2. **LEO Constellation Logistics:** SpaceX continued its high-cadence "utility" launches, treating orbit as a logistics domain. In the past week, it launched four missions (Starlink 6-81, 11-14, 10-51, and 6-87) on November 6 (two launches), November 9, and November 11, deploying a total of 115 Starlink V2 Mini satellites.[26]
3. **GEO Heavy-Lift:** On November 13, United Launch Alliance (ULA) is scheduled to launch its veteran Atlas V 551 rocket. Its high-value payload is the ViaSat-3 F2 satellite, a massive, ultra-high-capacity broadband satellite destined for Geostationary Transfer Orbit (GTO).[28] This launch follows a scrub last week caused by a faulty booster liquid oxygen tank vent valve, which has since been replaced.[29]

The launch market is no longer a monolith. It has clearly stratified into three distinct, mature verticals:

- **"Niche/Boutique" (Rocket Lab):** This vertical provides high-cost-per-kilogram, "white-glove" service. It offers speed, orbital precision, and sovereign capability for clients (like iQPS of Japan) who cannot or will-not wait for a rideshare and demand a dedicated launch.
- **"Logistics/Utility" (SpaceX):** This vertical is defined by extremely low-cost-per-kilogram, high-cadence, and commoditized access to LEO. The multiple Starlink launches this week are not "missions" in the traditional sense; they are an internal logistics operation, akin to a shipping company dispatching trucks.
- **"Legacy/High-Value" (ULA):** This vertical commands the highest cost but offers the

highest-perceived "mission assurance." It is the preferred choice for multi-billion-dollar, strategic national assets (like the ViaSat-3 satellite) that are deemed "too big to fail."

The success of New Glenn [1] is a direct and existential threat to ULA's dominance in this "Legacy/High-Value" market, as Blue Origin can now promise both reusability *and* high mission assurance.

Table 1: Key Launch Manifest (November 6-13, 2025)

Date (UTC)	Launch Provider	Rocket	Mission Name	Payload	Launch Site	Outcome
Nov 6, 19:45	Rocket Lab	Electron	'The Nation God Navigates'	QPS-SAR-14 ('Yachiho ko-1')	Mahia, NZ	Success [26]
Nov 6, 01:31	SpaceX	Falcon 9	Starlink 6-81	29 Starlink V2 Mini	Cape Canaveral, FL	Success [26]
Nov 6, 21:13	SpaceX	Falcon 9	Starlink 11-14	28 Starlink V2 Mini	Vandenberg SFB, CA	Success [26]
Nov 9, 08:10	SpaceX	Falcon 9	Starlink 10-51	29 Starlink V2 Mini	KSC, FL	Success [26]
Nov 11, 03:12	SpaceX	Falcon 9	Starlink 6-87	29 Starlink V2 Mini	Cape Canaveral, FL	Success [26]
Nov 13, 20:45	Blue Origin	New Glenn	ESCAPADE Mission	2x NASA Mars	Cape Canavera	Success [1]

				Probes	l, FL	
Nov 13, 03:04	ULA	Atlas V 551	ViaSat-3 F2	ViaSat-3 F2 Satellite	Cape Canaveral, FL	Scheduled [29]

4. Infrastructure: The Race for Sovereign Constellations

4.1 Facility Analysis: Orbitworks Inaugurates Abu Dhabi Factory

On November 12, 2025, Orbitworks inaugurated its new commercial satellite manufacturing and integration facility in Abu Dhabi's KEZAD economic zone.[2] This event is a significant strategic development, marking the establishment of the Middle East's first private space infrastructure company.

The facility is a joint venture between Marlan Space, an Abu Dhabi-based firm affiliated with the International Holding Company (IHC), and Loft Orbital, a U.S.-based "space-as-a-service" company.[2] The facility is equipped for end-to-end production, including assembly, integration, and testing (AIT), with cleanrooms, thermal vacuum chambers, and vibration tables.[2]

Its first task will be the production of the *Altair* constellation, the UAE's first homegrown, AI-enabled Earth-observation fleet.[2] This development provides a new blueprint for "Sovereign Space."

This move signals a global shift away from simply *buying* space assets toward *building* them via strategic technology transfer. Historically, a nation like the UAE would purchase a turn-key satellite from an established prime like Boeing, Airbus, or Thales, creating a permanent dependency for critical national infrastructure. The "New Space" model, pioneered by companies like Loft Orbital, is to sell the *capability* itself—a "factory-as-a-service" model. By partnering with Loft, Marlan Space gains the intellectual property, supply chain, and industrial processes to build, integrate, and test its *own* satellites domestically.

This immediately elevates the UAE from a passive *customer* to a regional *producer* and, eventually, an *exporter* of space technology. This "sovereign-in-a-box" model is highly

attractive and will almost certainly be replicated by other middle-powers globally, further fragmenting the legacy satellite manufacturing market.

4.2 Logistics & Refueling Context

No major refueling or in-space logistics missions were announced this week. The launch and infrastructure developments (New Glenn and Orbitworks) are the foundational layer. The *next* layer of infrastructure required for a true "Beyond Earth" economy is in-orbit logistics, a sector that remains nascent.[14]

This includes On-orbit Servicing, Assembly, and Manufacturing (OSAM), orbital transfer vehicles (OTVs) for moving assets between orbits, and, most critically, on-orbit refueling depots.[34] The "in-space highway"—the logistics network that will service, move, and refuel satellites—is the next, and still largely unrealized, major market opportunity.[16] While launch (Section 3) and satellite production (Section 4.1) are now becoming solved problems, the in-space logistics sector is the next frontier for investment and development.

5. Challenges: U.S. Policy and Regulatory Risk Factors

5.1 Risk Analysis: The U.S. Space Traffic Management Vacuum

A November 9 report has highlighted the "uncertain future" of the U.S. Office of Space Commerce (OSC).[4] This office is at the center of a paradoxical and high-risk political battle.

On one hand, the OSC is tasked with a mandate of critical national importance: developing the Traffic Coordination System for Space (TraCSS). This is the civil space traffic management (STM) system intended to take over the burden of orbital tracking and collision-avoidance warnings for all non-military satellites from the Department of Defense.[4]

On the other hand, this same vital office is being systematically defunded. It just suffered a 40% "rescission" (a clawback) of its approved FY2025 funds, and the FY2026 presidential budget request proposes an 85% cut to its $65 million budget.[4]

This is occurring as the orbital environment reaches a crisis point. ESA's 2025 Space Environment Report notes there are now over 1.2 million debris objects larger than 1 cm in orbit, any one of which can cause catastrophic damage.[36] This orbital congestion is driven primarily by the high-cadence launches of megaconstellations.[37]

The United States is therefore simultaneously *causing* the orbital congestion crisis (via its prolific commercial industry) and *abdicating* its leadership in *solving* it. By defunding the OSC, the U.S. is creating a dangerous power vacuum in global space governance. This failure to lead *invites* other bodies, such as the European Union (which is developing its own EU Space Act [39]) or China, to set the *de facto* global standards for STM. This is a massive, self-inflicted strategic blunder that introduces significant uncertainty and risk for all satellite operators.

5.2 Compliance Analysis: CMMC (Cybersecurity) Enters Force

As of November 10, 2025, the U.S. Department of Defense's (DoD) Cybersecurity Maturity Model Certification (CMMC) program is effective.[5] This final rule amends the Defense Federal Acquisition Regulation Supplement (DFARS) and represents a seismic shift in compliance for the entire U.S. aerospace and defense industrial base.[6]

The mandate ends the era of "self-attestation" for cybersecurity standards. All DoD contractors and, critically, their subcontractors, will now be required to achieve and maintain one of three CMMC certification levels—verified by third-party auditors—to be eligible to bid on *any* new DoD contract.[40] CMMC clauses will begin appearing in solicitations immediately as part of a phased rollout.[41]

While strategically necessary to protect the defense supply chain from cyber-espionage, CMMC also represents a highly disruptive and costly "non-technical" barrier to entry. The cost and complexity of achieving and maintaining certification are enormous. Large prime contractors (Boeing, Lockheed Martin, etc.) have the resources to absorb this cost. However, the small, innovative "New Space" companies and startups—the very source of the industry's recent disruptive innovation—do not.

The defense industrial base is now "scrambling" to adapt.[42] The unintended, but predictable, consequence of the CMMC mandate will be a consolidation of the defense-space market. It will increase costs and likely force many innovative small businesses to either be acquired by primes or exit the defense market entirely, potentially slowing the pace of U.s. innovation relative to its adversaries.

Table 2: Key Commercial & Policy Developments (November 6-13, 2025)

Date	Event	Organization(s)	Domain	Significance
Nov 9	Report on OSC Budget Crisis	Office of Space Commerce (OSC)	Policy / Risk	U.S. civil space traffic management (TraCSS) capability faces collapse from 85% proposed budget cut and 40% funding rescission. [4]
Nov 10	CMMC Program Effective	Dept. of Defense (DoD)	Regulation / Cybersecurity	New mandatory cybersecurity rules (DFARS) now effective for all defense/space contractors, creating major compliance burden. [5]
Nov 10	T-Minus Podcast on CMMC	T-Minus Space Daily	Analysis / Cybersecurity	Industry analysis highlights defense contractor "scramble" to meet new CMMC

				requirements effective today. [5]
Nov 12	Orbitworks Facility Inauguration	Marlan Space / Loft Orbital	Infrastructure / Manufacturing	First private satellite factory in Middle East opens in Abu Dhabi, signaling new "sovereign space" model. [2]
Nov 13	"Space Stocks to Watch" Report	MarketBeat	Finance / Market Analysis	High trading volume noted for Rocket Lab (RKLB), Boeing (BA), and GE Aerospace (GE) as industry indicators. [45]

6. Future Outlook: Strategic Implications for the "Beyond Earth" Economy

The events of this week (November 6-13, 2025) are not isolated. They accelerate three critical, long-term trends that will define the space economy for the next decade.

Trend 1: The Heavy-Lift Duopoly and the Commoditization of Deep Space
Blue Origin's New Glenn success 1 is the final validation of the reusable heavy-lift model and officially ushers in a market duopoly with SpaceX. This competition will now do for cislunar and interplanetary launch what the Falcon 9 did for LEO: drive prices down dramatically. The $80 million ESCAPADE mission 1 is the new model. This "commoditization" of deep space access will accelerate the deployment of large-scale infrastructure for the Artemis program 20 and enable a higher cadence of science and exploration.
Trend 2: The "Sovereign Space" Gold Rush and Geopolitical Fragmentation

The Orbitworks facility in Abu Dhabi 2 is the archetype of a new and powerful trend. The global space order is no longer dominated by a few "legacy" space-faring nations. The proliferation of "New Space" technology, particularly "space-as-a-service" platforms, is enabling regional powers to bypass the traditional-primes and build their own sovereign space capabilities. This will lead to a more commercially vibrant but also a more geopolitically fragmented and competitive space environment, increasing competition for orbital slots and spectrum and exacerbating the challenges of space traffic management.7

Trend 3: The U.S. "Policy-Commercial" Paradox and Self-Inflicted Wounds

The United States is facing a moment of profound strategic dissonance. This week, its commercial industry (Blue Origin, SpaceX, Rocket Lab) demonstrated total market dominance, from LEO to Mars. In parallel, its government is failing in its two primary responsibilities: 1) to provide critical public infrastructure, by defunding the Office of Space Commerce and its civil STM (TraCSS) mission 4, and 2) to implement necessary regulation (CMMC) in a way that does not stifle the very innovation that grants its market dominance.6

This U.S. regulatory and policy fumbling creates a dangerous vacuum in space governance and a significant, self-inflicted drag on its own industrial base. This opens a clear window of opportunity for international competitors (like the EU [39]) and adversaries [8] to close the gap—not by out-innovating U.S. industry, but by out-governing the U.S. state. The key market to watch in the coming year will be private Space Situational Awareness (SSA) and data companies, which will undoubtedly rush to fill the critical void left by the OSC's collapse.

Works cited

1. Blue Origin lands huge New Glenn rocket booster for 1st time after ..., accessed November 13, 2025, https://www.space.com/space-exploration/launches-spacecraft/blue-origin-lands-huge-new-glenn-rocket-booster-for-1st-time-after-acing-mars-escapade-launch-for-nasa
2. UAE enters space manufacturing era with Orbitworks' sovereign ..., accessed November 13, 2025, https://www.arabnews.com/node/2622371/corporate-and-sponsored-content
3. Abu Dhabi reaches for stars with factory that can produce 50 satellites a year - The National News, accessed November 13, 2025, https://www.thenationalnews.com/future/space/2025/11/11/abu-dhabi-reaches-for-the-stars-with-launch-of-space-site-that-can-produce-50-satellites-a-year/
4. Office of Space Commerce faces an uncertain future amid budget ..., accessed November 13, 2025, https://www.space.com/space-exploration/office-of-space-commerce-faces-an-uncertain-future-amid-budget-cuts-and-new-oversight
5. T-Minus Space Daily - Podcast - Apple Podcasts, accessed November 13, 2025, https://podcasts.apple.com/bs/podcast/t-minus-space-daily/id1676944102
6. CMMC Regulations: Key Questions and Answers for Defense Contractors - Holland & Knight, accessed November 13, 2025, https://www.hklaw.com/en/insights/publications/2025/11/cmmc-regulations-key-q

uestions-and-answers-for-defense-contractors
7. Extending the Battlespace to Space - CSIS, accessed November 13, 2025, https://www.csis.org/analysis/chapter-8-extending-battlespace-space
8. Strategic Implications of China's Cislunar Space Activities, accessed November 13, 2025, https://nssaspace.org/wp-content/uploads/2023/08/Strategic-Implications-of-Chinas-Cislunar-Space-Activities-8.21-final.pdf
9. National Space Transportation Policy: Issues for the Future - RAND, accessed November 13, 2025, https://www.rand.org/content/dam/rand/pubs/working_papers/2005/RAND_WR105.pdf
10. Mars One-Year Mission Craft - MDPI, accessed November 13, 2025, https://www.mdpi.com/2226-4310/10/7/610
11. AIAA - Aerospace America, accessed November 13, 2025, https://www.aiaa.org/docs/default-source/uploadedfiles/publications/aerospace-america-dec2020-year-in-review.pdf
12. Mars book 2 - NASA, accessed November 13, 2025, https://www.nasa.gov/wp-content/uploads/2023/04/sp-4521.pdf
13. The Use of Artificial Intelligence in Outer Space Capabilities - Project MUSE, accessed November 13, 2025, https://muse.jhu.edu/article/950954
14. A Review of Advancements in Inspection, Manufacturing and Repair, and Robots for On-Orbit Servicing, Assembly, and Manufacturing (OSAM) of Spacecraft - MDPI, accessed November 13, 2025, https://www.mdpi.com/2226-4310/12/9/819
15. In-orbit assembly startup raises $3 million after successful tests, accessed November 13, 2025, https://www.aerospacetestinginternational.com/news/in-orbit-assembly-startup-raises-3-million-after-successful-tests.html
16. Space Force Satellite Refueling Demos Coming in 2026 and 2028, accessed November 13, 2025, https://www.airandspaceforces.com/space-force-satellite-refueling-demos/
17. International Space Station: Launching NASA and Humanity into Deep Space, accessed November 13, 2025, https://www.nasa.gov/missions/station/iss-research/international-space-station-launching-nasa-and-humanity-into-deep-space/
18. In-Space Manufacturing Market Size ($ 11.2 Billion) 2030, accessed November 13, 2025, https://www.strategicmarketresearch.com/market-report/in-space-manufacturing-market
19. Windform. The new era of 3D printing composites, accessed November 13, 2025, https://www.windform.com/
20. Artemis - NASA, accessed November 13, 2025, https://www.nasa.gov/feature/artemis/
21. In-Space Servicing, Assembly, and Manufacturing (ISAM) - NASA, accessed November 13, 2025, https://www.nasa.gov/nexis/isam/
22. ESCAPADE - Wikipedia, accessed November 13, 2025,

https://en.wikipedia.org/wiki/ESCAPADE
23. 5 reasons why Blue Origin's New Glenn Mars launch was a big deal ..., accessed November 13, 2025, https://www.space.com/space-exploration/5-reasons-why-blue-origins-new-glenn-mars-launch-was-a-big-deal
24. Space News - Daily Commercial Space Industry & NASA News Feeds - Martin Wilson, accessed November 13, 2025, https://martinwilson.me/space-news/
25. Space Exploration Coverage, accessed November 13, 2025, https://www.space.com/space-exploration
26. Launch Log – Spaceflight Now, accessed November 13, 2025, https://spaceflightnow.com/launch-log/
27. Electron • 'The Nation God Navigates' - Spaceflight Now, accessed November 13, 2025, https://spaceflightnow.com/launch/electron-the-nation-god-navigates/
28. Space calendar 2025: Rocket launches and skywatching dates ..., accessed November 13, 2025, https://www.space.com/32286-space-calendar.html
29. UPDATE: ULA's ViaSat-3 F2 mission ready to try again on Thursday after replacing valve, accessed November 13, 2025, https://news.satnews.com/2025/11/12/update-ulas-viasat-3-f2-mission-ready-to-try-again-on-thursday-after-replacing-valve/
30. Atlas V rocket set for Thursday 10:04 p.m. launch, accessed November 13, 2025, https://www.rocketcitynow.com/article/news/national/atlas-v-prepares-for-thursday-launch-with-viasat-3-satellite-boost/525-92cf7db7-b332-44ce-bf9b-fdd69712afd3
31. Live coverage: ULA to launch ViaSat-3 following valve replacement on Atlas 5 rocket, accessed November 13, 2025, https://spaceflightnow.com/2025/11/13/live-coverage-ula-to-launch-viasat-3-following-valve-replacement-on-atlas-5-rocket/
32. Doubleheader Of Launches Set For Thursday, Solar Weather Permitting, accessed November 13, 2025, https://talkoftitusville.com/2025/11/13/doubleheader-of-launches-set-for-thursday-solar-weather-permitting/
33. UPDATE: It's a GO! as ULA progresses towards Thursday launch of ViaSat-3 F2 mission, accessed November 13, 2025, https://news.satnews.com/2025/11/13/update-its-a-go-as-ula-progresses-towards-thursday-launch-of-viasat-3-f2-mission/
34. Small Spacecraft Technology State of the Art 2024 report - NASA, accessed November 13, 2025, https://www.nasa.gov/wp-content/uploads/2025/02/soa-2024.pdf
35. Updates - SpaceX, accessed November 13, 2025, https://www.spacex.com/updates
36. ESA Space Environment Report 2025 - European Space Agency, accessed November 13, 2025, https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2025
37. Space sustainability comes down to Earth - The Space Review, accessed

November 13, 2025, https://www.thespacereview.com/article/5090/1
38. Space sustainability - OECD, accessed November 13, 2025, https://www.oecd.org/en/topics/sub-issues/space-sustainability.html
39. The Space Review: essays and commentary about the final frontier, accessed November 13, 2025, https://www.thespacereview.com/
40. CMMC Brings New Era of Cybersecurity Compliance for Defense Contractors, accessed November 13, 2025, https://www.jdsupra.com/legalnews/cmmc-brings-new-era-of-cybersecurity-5442531/
41. CMMC phased roll-out finally begins - McDonald Hopkins, accessed November 13, 2025, https://www.mcdonaldhopkins.com/insights/news/cmmc-phased-roll-out-finally-begins
42. Pentagon begins enforcing CMMC compliance, but readiness gaps remain, accessed November 13, 2025, https://defensescoop.com/2025/11/10/cmmc-compliance-dod-enforcement-defense-industry-readiness-gaps/
43. About CMMC - DoD CIO, accessed November 13, 2025, https://dodcio.defense.gov/cmmc/About/
44. CMMC 2.0 Details and Links to Key Resources - DoD Office of Small Business Programs, accessed November 13, 2025, https://business.defense.gov/Programs/Cyber-Security-Resources/CMMC-20/
45. Promising Space Stocks To Watch Now - November 13th - MarketBeat, accessed November 13, 2025, https://www.marketbeat.com/instant-alerts/promising-space-stocks-to-watch-now-november-13th-2025-11-13/