

May 2026

SPACE IS INFRASTRUCTURE FOR OUR FUTURE

2026 Vol. 1

Cosmos

Space
takes
hold

Spotlight: Orbital
Data Centers

Interview with
Planetary
Systems AI

Interview with
Blackstar Orbital

KPMG

Ignition

In early 2026, commercial space grew as an operating layer of the global economy

We're shifting from space activity to space dependency

The start of 2026 made one thing clear: space is moving deeper into the operating fabric of the global economy. Governments accelerated sovereign space strategies. Defense buyers pulled commercial providers into more complex mission architectures. Launch providers tested whether access to orbit could become routine enough to support downstream markets. Satellite operators fought for spectrum, device channels, enterprise routes, and regulated connectivity. Earth observation companies pushed beyond imagery toward persistent intelligence, AI-enabled analytics, and workflow-ready answers. Capital flowed toward companies with control over bottlenecks: launch, propulsion, sensing, spectrum, spacecraft manufacturing, data infrastructure, and defense-aligned capacity.

The underlying story is no longer just the expansion of a space sector. It is the emergence of space as a dependency layer. Connectivity, positioning, timing, sensing, weather, security, logistics, compute, and decision intelligence are all being shaped by capabilities above Earth. For enterprises and governments, the questions are becoming less abstract: where does space already touch operations? Where will reliance on space-enabled systems become unavoidable?

Proof becomes the new dividing line

As the space economy becomes more strategically important, the market is becoming more selective. Launches, payloads, funding rounds, authorizations, partnerships, and prototypes all matter, but each carries a different level of proof. A constellation deployment can expand capacity. A spectrum right can define a market. A defense award can create trust and production visibility. A data product can become intelligence when it enters a customer workflow. A financing round can extend runway toward operating proof. These are some of the levers shaping the next phase of competition.

The strongest companies and countries are not simply doing more in space; they are converting orbital capability into services that customers trust, regulators permit, defense buyers procure, enterprises integrate, and capital markets can underwrite.

The value is moving toward the translation layers: the points where rockets become access, satellites become networks, sensors become intelligence, missions become platforms, and infrastructure becomes something others depend on.

The next frontier is taking shape

For leaders outside the space industry, the strategic signal is straightforward: space is becoming a platform for advantage. It touches how nations defend, how networks connect, how companies monitor risk, how capital markets price resilience, how data becomes intelligence, and how future infrastructure may be built.

The winners will be the organizations that understand where space creates dependency before that dependency becomes obvious.

This isn't just a report - it's a launchpad.

Whether you're advising clients, exploring new markets, or shaping strategy, the intelligence within is meant to be used. To challenge assumptions. To unlock opportunity. To lead.

At KPMG LLP, we believe space is not a sector - it's a platform. One that touches every industry, every region, every ambition. And as innovation accelerates, so does the need for clarity, fore-sight, and bold thinking. This report provides you the opportunity to identify opportunities here on Earth based on all the new activity emerging amongst the stars.

Because the future isn't waiting.

It's already lifting off.



— **Brian Miske**
Americas Space Lead
KPMG LLP



Authored by

Brian Miske | Americas Space Lead, KPMG LLP

David Pessah | Executive Director & Discovery Leader, KPMG Ignition

Contributors

Jeffrey Phillips | Director, KPMG Advisory

Jozy Assa-Jacobson | Director, KPMG Ignition

Heather Stead | Associate Director, KPMG Ignition

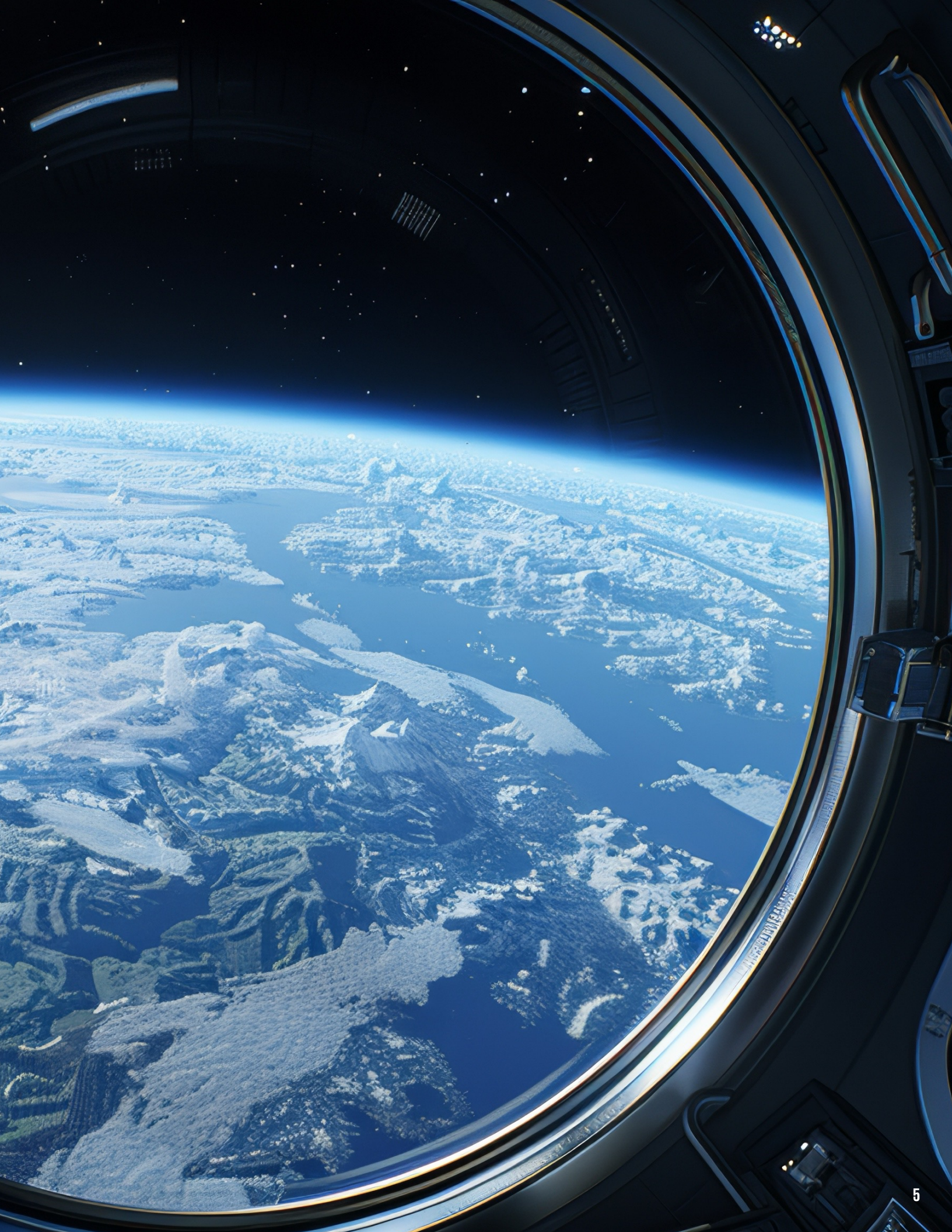
Jack Surprenant | Senior Associate, KPMG Ignition

Marshea Robinson | Associate, KPMG Ignition

Harper Robbins | Associate, KPMG Ignition

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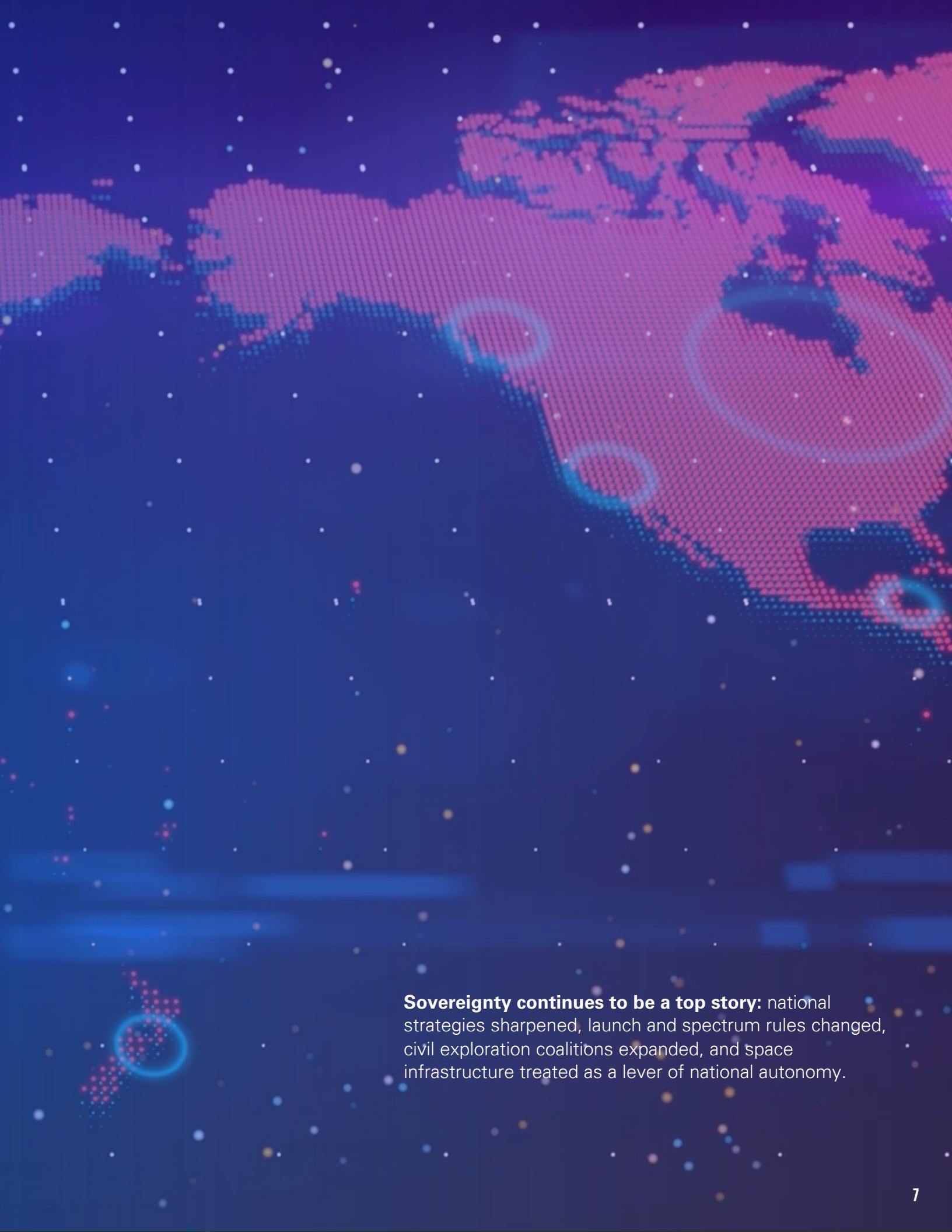
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Geopolitics

Space geopolitics expanded in two directions at once in early 2026. Artemis II turned lunar exploration back into a public diplomatic arena, while governments tightened the rules, budgets, launch paths, connectivity systems, and partnership structures that determine who can depend on space on sovereign terms.



Sovereignty continues to be a top story: national strategies sharpened, launch and spectrum rules changed, civil exploration coalitions expanded, and space infrastructure treated as a lever of national autonomy.



2026

United States + Space

The US used Artemis, budget direction, spectrum rules, and launch licensing to turn civil-space leadership into a broader sovereignty stack.

The success of the Artemis II mission reawakened public and governmental interest in the future of the Artemis program, which received a strategic overhaul this quarter. As part of NASA's "Ignition" event this March, agency leaders outlined a tripartite plan for establishing a permanent lunar base and reaffirmed the changes to the Artemis program schedule previously announced in February. NASA has already embarked on Phase One of the plan, titled "Build, Test, Learn," which is defined by a shift from specialized, infrequent missions to a higher cadence, more modular approach. Through CLPS (Commercial Lunar Payload Service) deliveries and the LTV (Lunar Terrain Vehicle) program, NASA plans to increase the frequency of moon-related missions, sending rovers, instruments, and leading technology demonstrations with a broad range of use cases.¹

Budgetary measures this quarter reflected this lunar commitment. The President's FY27 budget request for NASA asked for cuts to the agency's top line by ~23% versus FY2026 enacted funding and reprioritized the remaining budget toward human Moon and Mars exploration. In the proposal, exploration rose ~9% to become ~45% of NASA's requested budget, and is supplemented by planned obligations from prior multi-year Moon/Mars-related funding.² The budget request is a proposal, not an enacted appropriation, but it signals a governing preference for lunar return, commercial Moon/Mars infrastructure, and post-ISS LEO transition over a broader status-quo NASA portfolio.

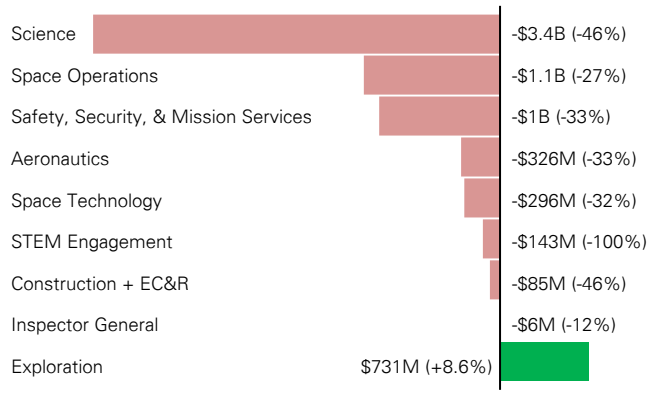
The Senate Commerce, Justice, Science (CJS) Appropriations Subcommittee pushed back on some of the requested cuts during a hearing on April 28th, with Senators on both sides of the aisle echoing concerns discussed in the House CJS Appropriations

subcommittee hearing the day prior: that the proposed funding package would be insufficient to cover existing programs and expand upon the initiatives proposed at the Ignition event. The FY27 request is markedly similar to the president's FY26 request, which the CJS committee explicitly rejected, instead funding NASA at similar levels to FY25.³

In support of the advanced lunar timeline, the White House Office of Science and Technology Policy released a memorandum at the 41st Space Symposium in April mandating NASA, the Department of Defense and the Department of Energy to accelerate the development of space nuclear power and propulsion systems through interagency coordination. The directive set a firm target of installing a functional nuclear reactor on the Moon's surface by 2030, framed as geopolitical necessity in strengthening US space presence. It also established a longer-term goal of providing electricity, heating & propulsion required for permanent American presence on the Moon & eventually Mars.⁴

NASA Budget: FY26 Enacted → FY27 Request

Overall: \$24.44B (FY26E) → \$18.83B (FY27R) | -\$5.6B (-23%)



NASA, Fiscal Year 2027 Budget Request Summary



New regulations have also changed the commercial operating environment

On March 17, the US FAA finalized the end of the transition to Part 450-only commercial launch and reentry licensing. The rule consolidation provides increased flexibility for companies with diverse launch portfolios, as multiple types of vehicle, mission and launch site can now be covered under one operator license. However, operators—mostly smaller companies—who did not transition to Part 450 prior to the deadline face the burden of significant internal compliance upgrades and a higher standard for safety in order to obtain permission to launch under the new framework.⁵

FCC actions added a second regulatory layer. On April 30, the FCC modernized satellite spectrum-sharing rules for space-based broadband, replacing older GSO / NGSO sharing rules with a framework intended to permit more simultaneous satellite broadband operations.⁶

A week earlier, FCC's Space Bureau reaffirmed existing Mobile Satellite Service licensees' exclusive rights in certain D2D and D2C spectrum bands, dismissing requests and petitions from other operators seeking access to the same bands.⁷ Together, these actions make spectrum governance a geopolitical control point: capacity, interference rights, D2D market access, and investor confidence all run through national regulatory choices.



2026

China + Space

China's 15th 5-year plan — set into action at the start of 2026 — includes "space and satellites" as a strategic focus area.⁸

China has continued to drive manufacturing and deployment of state-supported megaconstellations for national broadband and more. So far this year, the country has sent up batches of satellites for its SSST Qianfan (Thousand Sails)⁹ and CAST Guowang constellations.¹⁰ Both are aimed at providing national and global internet services split between commercial and government markets. Both constellations plan to ultimately have >10,000 satellites in orbit in the coming decade. And the work has just begun. At the end of last year, China submitted an application to the ITU (International Telecommunication Union) for an additional 203,000 satellites across 14 distinct constellations, its largest application to date, indicating more launches are on the way.¹¹

The satellite launch volume is a sovereignty signal: spectrum and orbital resources are becoming strategic claims on future network geography and China is working to reserve optionality across constellation architectures while building domestic capability. Overall, China's state-led space efforts continued to align launch cadence, constellation deployment, and orbital-resource to infrastructure scale.

But rising geopolitical tensions threaten to constrain its tempo. In January, China Strategic Technology group disclosed that tense Sino-American relations as well as US sanctions and restrictions had caused some contracts and cooperation related to space manufacture and launch to collapse.¹²



2026

Europe + Space

Europe's sovereignty stack is being built through launch access, secure connectivity, navigation, public EO, and supported by ESA-scale funding.

Arianespace is advancing Europe's domestic launch capabilities. In January, EUSPA signed a new Ariane 6 launch contract with Arianespace for the Galileo L18 second-generation satellite pair, explicitly linking Galileo deployment with European launch capacity.¹³ Then in February, Europe got a good commercial heavy-lift campaign datapoint after years of dependence concerns as Ariane 64 successfully sent up 32 Amazon Leo satellites.¹⁴

Secure connectivity also transitioned from program architecture into use when Cyprus completed the first operational acquisition and deployment of EU GOVSATCOM Hub services in March.¹⁵ The EU then extended the secure-connectivity perimeter through its agreement with Norway and Iceland, allowing both

countries to join GOVSATCOM and IRIS² participation.¹⁶

The UK also took steps to connect civil strategy, industrial policy, secure connectivity, spaceports, and delivery authority more tightly. On March 4, the UK allocated more than GBP 500 million to national space programs, including NSpOC, C-LEO, in-space servicing and manufacturing, innovation, clusters, and spaceport infrastructure.¹⁷

This year has also seen significant Intergovernmental agreements. In April, French President Macron and Polish Prime Minister Tusk announced a collaborative deal between Thales Alenia Space, Airbus Defence & Space and RADMOR to develop a geostationary telecommunications satellite for the Polish military.¹⁸ ESA and Canada signed a General Security of Information Agreement at the 2026 Space Symposium, creating a framework to exchange classified information, protect sensitive data, and promote economic prosperity in the sector.¹⁹



2026

Other Countries + Space

CANADA

Canada turned lunar visibility into a sovereignty and alliance stack built around launch law, launch grants, Arctic connectivity, and classified-information exchange with ESA.

Artemis II gave Canada a visible role in lunar diplomacy as Canadian Space Agency (CSA) astronaut Jeremy Hansen flew around the Moon. The mission was civil-space cooperation in practice: the United States led the mission, but Canada was inside the crewed lunar architecture.

Canada also rolled up new programs and policies to bolster national space capabilities and sovereignty.

Canada's "Launch the North" challenge is aimed at advancing Canadian-designed launch vehicles and supporting technologies, with the goal of enabling Canadian payloads to launch from Canadian soil and achieving initial responsive light-lift capability by 2028. In March, the government announced CA\$105 million in multi-year grants and three conditionally approved projects, each for CA\$8.3 million, under the first round.²¹

In April, the largest communications provider in Canada's North (Northwestel) signed a multi-year contract with Telesat to leverage the Government of Canada's Lightspeed capacity pool to support the rollout of satellite broadband to remote communities in northern Canada.²²

Bill C-28, the Canadian Space Launch Act, was introduced on April 21 to establish a legislative framework for launch and re-entry activities in Canada by amending the Aeronautics Act and related statutes.²⁰

The Artemis II mission was civil-space cooperation in practice: the United States led the mission, but Canada was inside the crewed lunar architecture.

INDIA

India's forays into space this quarter were largely focused on international cooperation, as IN-SPACe worked across borders to accelerate its space program.

India and South Korea formed a joint working group between ISRO and KASA to explore opportunities for cooperation at the National Space Agency level.²³ In support of this unified effort, the two countries held an India-ROK "Space Day" in Bengaluru on April 20th to promote collaboration and mutual support for satellite navigation system. The event brought together startups, industry leaders, and research institutions from both countries to accelerate innovation and commercialization in the space ecosystem.²⁴

India also signaled its intent to ally with Russia on the development of India's planned space station, hoping to draw from the country's experience with space stations to support subsystem development and astronaut training.²⁵

RUSSIA

Sanctions and heightened tension have led Russia to be largely insular in their space economy development so far this year.

Western sanctions continue to restrict the export of aviation and space industry technology to Russia, leading to the near-total cessation of joint activities with Europe and the United States, including Soyuz launches from Kourou and the ExoMars mission.²⁶ Russian satellites have shadowed US government satellites in LEO, and Moscow is reportedly developing a nuclear ASAT weapon that, if deployed and detonated, could degrade or destroy any satellites in its path and within the same orbital region—a highly destabilizing development.²⁷

Despite international barriers, Russia has continued to build up its national space program. In Q1, Russia successfully launched 134 spacecraft across 5 launches, bringing the total orbital group to 364 and establishing a low-orbit broadband constellation at the end of March.²⁸ Roscosmos released its plan for a three-stage delivery of a nuclear power plant to the moon,²⁹ and the Russian Academy of Sciences approved the formal concept for the Russian segment of the ILRS (International Lunar Research Station) in April, an ongoing collaborative project with China.³⁰ Russia is also expanding its national messaging around space, with the first annual "Space Week" was held from 4/6-4/12, consisting of nationwide educational and cultural events; the holiday was established by Executive Order at the end of December 2025.³¹ This followed the 5th open recruitment process for cosmonaut corps by Roscosmos in February.³²

Notable Developments: Geopolitics

January



Portugal signed the Artemis Accords



Oman signed the Artemis Accords



EUSPA signed Ariane 6 Launch Contract

February



Russia began its 5th open recruitment process for Roscosmos



Arianespace performed its first successful launch of Amazon LEO satellites from French Guiana

March



UK Space Minister Liz Lloyd announced £500M in commercial space funding



Cyprus performed the 1st operational use of EU GOVSATCOM hub services



Canada awarded Phase 1 grants for “Launch the North” campaign



FAA finalized transition to Part 450 regulations



NASA hosted Ignition event

Norway and Iceland signed on to GOVSATCOM & IRIS2 programs

April



Artemis II launch



Northwestel and Telesat contracted use of Canada’s Lightspeed capacity pool



Start of Russia’s Space Week



Long March-8 launch to Qianfan constellation



Long March-6 launch to Guowang constellation



White House OSTP released nuclear space policy memo



Canada and the ESA signed General Security of Information agreement



Latvia signed the Artemis Accords



India and Korea hosted “Space Day” in Bengaluru



Canada signed Bill C-28



Jordan signed the Artemis Accords



The FCC reaffirmed existing rights to certain exclusive D2D and D2C bands



Morocco signed the Artemis Accords



The FCC updated satellite spectrum sharing regulations



Russia successfully carried out maiden launch of Soyuz-5 rocket



Defense



2026

Defense

Defense customers are assembling layered and integrated capabilities to defend, sense, communicate, navigate, target, and fight through orbit

Defense customers are no longer simply buying more space assets. Throughout this year, we're beginning to see the evolution and integration of missile warning, missile tracking, launch access, protected SATCOM, PNT resilience, commercial sensing, tactical communications, ground management, software-defined command-and-control (C2), multi-source data fusion, range cyber, and allied architecture to ultimately function as parts of one overall operating system.

The militarization of upper orbits is progressing from passive tracking to active kinetic intercept, with the Space Force's Golden Dome architecture targeting a 2028 demonstration for a proliferated low Earth orbit (pLEO) constellation capable of boost, midcourse, and glide-phase threat engagement. To field this active shield, Space Systems Command (SSC) awarded 20 space-based interceptor (SBI) prototype contracts under a \$3.2 billion Other Transaction Authority (OTA) solicitation, pairing traditional aerospace primes (Lockheed Martin, Northrop Grumman, RTX, General Dynamics and Booz Allen Hamilton) with non-traditional entrants (SpaceX, Anduril, GITA, True Anomaly, Quindar, Sci-Tec, and Turion).¹

This rapid industrial scaling is backed by deep fiscal mobilization. In March, the Golden Dome's estimated architectural cost rose to \$185 billion to accommodate added, classified space-based intercept capabilities, funded by \$13.4 billion from the enacted FY2026 defense appropriations and an increased FY2027 request of \$6.4 billion.² The \$2B FY2027 request for "Special Space Activities" is assumed to serve as the primary holding account for SBI payload development. This financial framework directly supports the deployment of the shield's tracking network led by the SDA (Space Development Agency). SpaceX is contracted to operate these launches under key national security task orders, with SDA-2 covering the launch of 36 Tranche 2 satellites (built by L3Harris) and eight F2 satellites, while SDA-3 covers two additional launches carrying 36 Lockheed Martin-manufactured Tranche 2 satellites.³

These budget lines are also driving the production of advanced orbital assets. In April 2026, Raytheon delivered its second Next-Gen OPIR GEO Block 0 sensor payload to Lockheed Martin, employing advanced optics and algorithms to detect hypersonic and ballistic heat signatures.^{4, 5}

In the MEO regime, BAE Systems completed the Preliminary Design Review (PDR) for the 10-satellite Missile Warning and Tracking (MWT) Epoch 2 constellation in under nine months. Epoch 2 intends to elevate the resilient capabilities of the initial 12 Epoch 1 satellites and further shifting defense architectures from vulnerable isolated payloads into highly survivable, maneuverable surveillance networks.⁶



Proliferated Constellations

The vulnerability of legacy, high-altitude systems has accelerated the deployment of distributed, refueling-capable orbital networks designed for persistence. SSC's Andromeda Program is indicative of this transition. In April, it awarded initial IDIQ contracts to 14 commercial vendors to build a highly maneuverable successor to the current Geosynchronous Space Situational Awareness Program (GSSAP) called RG-XX. The contracts mandate on-orbit refueling to maximize active shelf-life.⁷

Sovereign orbital expansion is also accelerating among allied nations. Firstly, the European Defence Agency (EDA) launched the VLEO-DEF program, awarding a €15.65 million contract to a 17-company consortium led by Spain's Sener and funded by five member states (Spain, France, Luxembourg, Portugal, and Slovenia) to design military satellite concepts optimized for Very Low Earth Orbit (VLEO) to exploit atmospheric drag for rapid debris clearing and high-resolution imaging.⁸ This program builds upon the €10 million Austrian-Dutch Military Crisis-Response satellite constellation initiated in 2024 to maneuver dynamically between LEO and VLEO.

This allied push for orbital autonomy is driving nations to bypass custom, multi-year design cycles through direct commercial procurement. Early in the year, the Swedish Armed Forces signed a nine-figure, multi-year agreement with Planet Labs and ICEYE, securing direct ownership of a dedicated suite of Planet satellites and integrated high-resolution SAR data streams to establish a rapid, low-risk sovereign space capability.⁹ This standardized, cost-effective service model, which has netted Planet over \$500 million in satellite service contracts over the past year including national security agreements with Japan (JSAT) and Germany, underscores a massive structural shift as the global defense establishment integrates COTS hardware directly into sovereign architectures.

Commercial Integration

The erosion of the historical divide between commercial and military space sectors has made commercial innovation a core benchmark for defense capability. Through the Hybrid Acquisition for Proliferated LEO (HALO) vehicle, the SDA is procuring communications "as-a-service" from emerging space firms, including a \$30 million Track 2 award to AST SpaceMobile to demonstrate software-defined commercial broadband connections directly to military tactical radios without proprietary hardware.¹⁰ This was followed by a \$48.9 million Track 1 OTA awarded to Capella Space in April to validate advanced RF payloads, adaptive beamforming, and secure ground-to-space tactical waveforms by November 2027.¹¹

Within Intelligence, Surveillance and Reconnaissance (ISR), the National Reconnaissance Office (NRO) used its Commercial Solutions Opening (CSO) contracting mechanism to issue its first three awards to High Earth Orbit Robotics (for satellite-hosted close-up imaging), SatVu (for thermal infrared mapping), and Sierra Nevada Corporation (for RF geolocation), thereby incorporating commercial startups directly into classified systems.¹²

To break into the highly competitive contracting landscape, startup companies are actively partnering with established defense primes to co-develop competitive pitches, demonstrating functional on-orbit hardware first to prove immediate utility. As a result, the SDA's approach to risk management has shifted toward an agile, commercial-first procurement model, therefore transforming acquisition away from legacy and cost-plus structures and toward rapid, iterative tranches. That shift was evident in March when SDA Acting Director Gurpartap "GP" Sandhoo implemented a strategic launch pause through May in response to supply chain bottlenecks, accepting minor on-orbit technical anomalies under a COTS "Ford Model T" production paradigm instead of returning to slower development timelines.¹³



Active offensive and defensive counterspace capabilities are graduating from testing phases into live operational deployments.

This high-speed procurement requires a parallel revolution in launch services. On January 9, the Space Force awarded SpaceX \$739M for nine national security launches under the NSSL Phase 3 Lane 1 construct. Five are dedicated to the critical SDA missile-warning and fire-control deployments detailed in Section 1.¹⁴ This was augmented by a \$178.5 million task order (SDA-4) for two Falcon 9 launches of Sierra Space-built missile tracking payloads starting in Q3 2027.¹⁵ To prevent future supply bottlenecks and maintain launch competition, the Space Force is also actively on-ramping new entrants, including Blue Origin, Rocket Lab, and Stoke Space, to compete for subsequent Lane 1 task orders.¹⁴

Counterspace

Active offensive and defensive counterspace capabilities have graduated from testing phases into live operational deployments. In April 2026, the US Space Command confirmed that the Russian Nivelir co-orbital ASAT program is now fully operational, having conducted several sub-1km close-approaches to shadow critical US national spy satellites in LEO.¹⁶ ¹⁷ Compounding this risk, US intelligence also confirmed the continued development of a Russian satellite platform designed to carry a nuclear weapon, presenting an indiscriminate electromagnetic pulse (EMP) threat that would damage commercial and military satellite infrastructure globally and impair the economic utility of low Earth orbit. Some open-source analysis suggest that China may be developing direct-ascent ASAT capabilities alongside its on-orbit refueling experiments, which may give rise to external speculation on technical overlap between satellite servicing and co-orbital interception.^{18, 19}

This rapid escalation of dual-use capabilities has forced a global defensive response. The Secure World Foundation (SWF) highlights an emerging trend toward "bodyguard" satellites, which are small, highly maneuverable co-orbital spacecrafts recently developed by France, Germany, Japan, and India to shadow and defend high-value military assets from physical intercept. To prepare for this highly dynamic environment, the Space Force's orbital warfare unit, Mission Delta 9, has integrated a live satellite into its training pipeline to practice active, on-orbit defensive and offensive maneuvers.²⁰

This preparation is critical as non-kinetic counterspace operations have become heavily integrated at the tactical level, with the SWF 2026 Global Counterspace report documenting a significant surge in Russian GPS jamming in the Baltic region, which has disrupted civilian aviation, alongside persistent Iranian GNSS jamming and active spoofing of Starlink signals in active conflict zones.²¹

These operational requirements are simultaneously reshaping bilateral alliances in Southeast Asia, where Turkish defense firms CTech and Roketsan leveraged the DSA 2026 expo in Kuala Lumpur to deepen defensive integration with Malaysia.²² CTech finalized agreements to supply jamming-resistant satellite communication modems to the Malaysian Armed Forces to preserve secure communications in EW-contested environments, while Roketsan secured agreements to deliver advanced precision-strike surface-to-surface missiles. Managing these fast-moving, contested orbital maneuvers places a severe premium on the underlying ground systems, exposing the vulnerabilities of the legacy command structures that are now being systematically rebuilt.

C2 Modernization and Ground Segment Hardening

The systemic failures of legacy ground segment acquisitions have driven a complete modernization of the C2 layer. This shift was accelerated by the Pentagon's termination of RTX's GPS Next-Generation Operational Control System (OCX) ground segment after 15 years of continuous contract delays and a total spend exceeding \$6.27 billion.²³ Following this cancellation on April 17, 2026, the Space Force restructured its PNT strategy, awarding Lockheed Martin a \$105 million contract to sustain and modernize the legacy GPS control network while the service began retooling for cloud-native alternatives.

To bypass the long-troubled acquisition cycles of legacy programs like ATLAS, Space Systems Command initiated the Kronos program. In early 2026, Kronos awarded its first Commercial Solutions Opening (CSO) prototype contracts to Leidos (\$1.43 million) and MapLarge (\$499,828) under the rapid Software Acquisition Pathway, aiming to deploy modular mission-management tools that integrate intelligence planning and real-time operations.²⁴ This software-first agility is being paired with massive ground integration efforts, including a \$446.8 million Ground Management and Integration (GMI) contract awarded to Kratos Defense & Security Solutions to lead a team comprising Northrop Grumman, Auria, ASRC Federal, and Rise8 to unify legacy and next-generation ground assets under the DoW's Future Operationally Resilient Ground Evolution (FORGE) platform.²⁵

Hardening this digital architecture also required securing physical launch gateways. Space Launch Delta 30 at Vandenberg Space Force Base activated the 630th Cyberspace Squadron in March, while Space Launch Delta 45 at Patrick Space Force Base integrated the 645th Cyberspace Squadron.²⁶ These defensive cyber units are tasked with protecting physical launch-pad infrastructure, telemetry links, and ground stations from offensive cyber attacks and malware injections. This comprehensive cyber hardening is laying the groundwork for the next major evolutionary step in space defense: transitioning the decision-making process itself from vulnerable ground networks to autonomous, on-orbit systems.

The future of defense lies in the seamless, automated pairing of orbit-to-ground intelligence with autonomous strike assets.

AI, Automation, and Defense

The explosion of orbital data streams has shifted focus to onboard AI-first processing to compress "sensor-to-shooter" latency. In March 2026, Satellogic introduced Merlin, an AI-first defense constellation designed for daily planetary remapping at 1-meter resolution.²⁷ Merlin satellites leverage onboard AI processing for real-time pixel classification, change detection, and target identification, enabling direct intelligence alerting without high-bandwidth ground downlinks. Highlighting the commercial viability of this edge-intelligence model, Satellogic signed a \$12 million contract in April to deliver an in-orbit NewSat satellite from its Aleph-1 constellation directly to a sovereign defense customer.²⁸

This edge-processing power is being tied directly into cross-domain military networks. Early in the year, the Air Force Research Laboratory (AFRL) awarded Palladyne AI the HANGTIME contract. This project integrates Palladyne's SwarmOS collaborative autonomy platform with space-based assets for the first time, enabling real-time, cross-domain coordination between satellites, aerial drones, and ground platforms to autonomously share tactical intelligence and track dynamic targets.²⁹

At the strategic level, the Pentagon is cementing this shift with historic funding. The FY2027 budget request proposed \$54.6 billion for the Defense Autonomous Warfare Group (DAWG), a specialized successor to the Replicator program tasked with the procurement of over 300,000 weaponized, domestically manufactured drones by 2027.³⁰ To operationalize this massive influx of robotic hardware, Defense Secretary Pete Hegseth announced plans in April to establish a new sub-unified command for autonomous warfare, signaling that the future of defense lies in the seamless, automated pairing of orbit-to-ground intelligence with autonomous strike assets.³⁰



Notable Developments

JAN

- **2,440 companies have secured a position on the IDIQ** that was first announced and awarded in 2025 under the Scalable Homeland Innovative Enterprise Layered Defense (SHIELD) ³¹
- **Lockheed Martin / GE Aerospace completed engine tests** for a rotating detonation ramjet for hypersonic missile applications, advancing propulsion capabilities for next-gen missile systems ³²
- **RTX (Raytheon) signed five long-term agreements** to scale precision munition production (Tomahawk, AMRAAM, SM-6), increasing capacity for integrated missile defense operations ³³

FEB

- **The National Reconnaissance Office awarded first Commercial Solutions Opening contracts** to High Earth Orbit Robotics, SatVu, and Sierra Nevada, expanding use of commercial ISR providers
- **Boeing opened EO/IR sensor production facility** in El Segundo to scale manufacturing of missile warning payloads
- **Canada publishes its defense strategy listing Space-Based Intelligence;** Surveillance and Reconnaissance; Space Domain Awareness; Satellite Communications; Space Launch as key sovereign capabilities ³⁴

MAR

- **Ovzon, a Stockholm-based satellite communications provider, secured a contract for \$1.3M** to provide satellite communications services and technical support for US defense operations ³⁵
- **The DoW signed a framework agreement with Lockheed Martin** to rapidly increase production of Precision Strike Missile (PrSM) ³⁶

APR

- **Lockheed Martin began demonstrations of modular, maneuverable satellites for RPO and C2** with demonstrations targeted for late 2028 and early 2029 ³⁷
- **The Space Force released the Objective Force Plan for the next 15 years,** which entails the desired future state of US defense, including calls for new satellites and modernizing the missile warning, tracking, and defense approach ³⁸
- **The Space Force announces the establishment of a Cislunar Coordination Office** to manage its nascent deep-space missions, tied to a White House executive order describing the military's space responsibilities as extending tvLEO to cislunar
- **Director of Space Development Agency, Gurpartap "GP" Sandhoo announces a launch pause** to address technical and supply chain constraints after facing difficulties with readiness of technologies, highlighting tradeoffs between speed and reliability
- **Raytheon delivered second Next-Gen OPIR EO/IR sensor to Lockheed,** advancing missile warning capability against hypersonic threats
- **The Space Rapid Capabilities office awarded three Small Business Innovation Research contracts** worth \$3M each to develop sensors designed to help US military satellites in GEO detect when they're being tracked from the ground to help improve the space domain awareness capabilities.



A satellite with two large solar panel arrays is shown in orbit above Earth's cloud-covered surface. The satellite has a central body with various instruments and a large circular dish antenna. The background is a vast expanse of blue and white clouds.

Interview: Planetary Systems AI

Building the intelligence layer for the space economy with Planetary Systems AI CEO Cindy Chin



Planetary Systems AI's mission is to accelerate data flow and intelligence at the speed of space for decision support in space operations.

What was the founding vision behind Planetary Systems AI? What problems were you setting out to solve?

The idea emerged from a two-year deep dive I did to develop an investment thesis focused on space after exiting a video AI company I co-founded. I had spent over a decade of engaging with NASA at a Datanaut and through their open data programs and public affairs initiatives. It became clear that the volume of space data was vast but was also highly fragmented and difficult to use. There are tens of thousands of datasets, but they're siloed, unstructured, and not interoperable. At the same time, satellite deployments were accelerating rapidly.

That combination of massive, disconnected data and increasing orbital activity in LEO (low earth orbit) created a perfect use case for AI. Planetary Systems AI was founded to solve two core challenges - data fusion and data interoperability - to enable faster, more informed intelligent decision-making in space operations.

How would you describe your platform and its core capabilities?

We've built an intelligent decision-making platform that integrates and fuses disparate space datasets into a queryable system. At its core, the platform ingests heterogeneous datasets, such as orbital positions, RF signals, power telemetry, and object identifiers, and normalizes them into a unified data layer.

Our stack includes historical models of satellite positions, computer vision to identify objects in orbit, and modular and multi-modal AI components that allow for plug-and-play application development.

The result is a system that transforms raw data into contextual insights that enable applications like satellite threat detection, orbital traffic management, and space domain awareness.

Where does AI play the most critical role in your solution?

AI is essential for turning fragmented, high-volume data into actionable intelligence at the speed of mission.

We leverage existing large language models and fine-tune them to space-specific use cases rather than building from scratch.

From there, we layer in and built specialized models, such as computer vision for object recognition and predictive models for orbital behavior and integrate them into an agent-based architecture. These agents are designed to execute specific tasks, like monitoring space weather, analyzing historical anomalies, or identifying active threats in orbit.

Importantly, we are moving these capabilities to the edge and deploying AI directly on satellites. Our first flight launch is scheduled this summer where we partnered with USC SERC to test our capabilities in LEO orbit. This allows real-time processing in orbit, reducing the need to downlink massive datasets and enabling faster responses to events like debris collisions or satellite disruptions.

How is your approach different from other AI or space data companies?

Our differentiation comes from focusing on real operational needs and the requirements in the defense industry. We work closely with space operators and stakeholders, understanding their workflows, constraints, and priorities.

We're not building AI for its own sake. We're building autonomous, modular systems that directly support mission-critical decisions. Our models are fine-tuned based on real operator inputs and we focus heavily on solving data silos and enabling cross-system integration, and speed which remains one of the largest challenges in space systems. That includes maintaining "humans in the loop" to validate and guide AI outputs, especially in high-stakes environments like defense and orbital operations at this stage.

What are your primary customers and use cases today?

On the defense side, our primary customer is the US Space Force, where we support space domain awareness and satellite threat assessment. We help enable faster decision-making and reduce operational surprise in orbit.

On the commercial side, we're targeting industries tied to risk and continuity—such as insurance, finance, and enterprises reliant on satellite infrastructure. With global systems like GPS underpinning everyday life, even a short disruption can have massive economic impact, making resilience a critical need.

Why is this problem becoming urgent now?

The pace of change in space is unprecedented. Satellite constellations are expanding rapidly, launch cadence is increasing, and more countries and companies are entering orbit.

At the same time, space has become a contested domain, and global economies are deeply dependent on space-based systems. What used to be abstract risks are now critical vulnerabilities, affecting everything from navigation to financial transactions to supply chains.

Can you share more about your near-term roadmap and milestones?

In the near term, we're focused on delivering on government contracts and continuing to refine our agentic AI systems. We're also preparing for in-orbit deployment this summer by working with partners in satellite manufacturing and infrastructure.

We have an upcoming mission in collaboration with USC using a CubeSat to test our computer vision model and data collection in space. This is a foundational step toward deploying autonomous AI capabilities on the edge, directly in orbit.

Space has a data problem

Solving space's data fragmentation is the unlock for the entire space economy – Planetary Systems AI is tackling the core challenge of siloed, non-interoperable datasets by fusing them into a unified intelligence layer that enables faster, more informed decision-making.

AI in orbit enables real-time decisions when every second matters

By deploying AI directly on satellites, the platform enables real-time, in-orbit decision-making, reducing latency and enabling faster responses to threats, anomalies, and disruptions.

Space is shifting from theoretical to mission-critical, and risk is rising

As orbital activity accelerates and global systems depend more heavily on space infrastructure, managing risk, resilience, and coordination is becoming urgent across defense and commercial sectors.



What kind of ecosystem is required to enable this vision?

It's a combination of data, talent, technology, capital, and collaboration. Data is the "oxygen" of AI, but success also depends on human expertise, public-private partnerships, and continuous experimentation.

The ecosystem spans infrastructure, data platforms, and applications—all working together. The companies that succeed will be those that integrate across these layers rather than operating in silos.

Looking ahead to 2040, what future does Planetary Systems AI help enable?

Our work enables safe and scalable operations in space, from orbital traffic management to deep space exploration. If humanity is going to build infrastructure beyond Earth, whether that's asteroid mining, habitats, or interplanetary travel, we need reliable systems to map, monitor, and navigate the environment.

As the orbital data centers are being built and deployed in orbit, PSAL's satellite threat assessment will become mission critical. The ODC's will need operational mission plans for data downlinks, maneuvers, or protection to mitigate any operation surprise such as conjunctions, collisions, or service disruptions. PSAL is already building those key capabilities today to support ODC operations autonomously on what is an inevitable inherent risk and the roadmap to mitigate that operational surprises.

In many ways, we're helping build the "map" for a future space economy—ensuring that as activity grows, it remains safe, coordinated, and sustainable while our day-to-day life on the ground continues without disruption.

What final message would you leave with readers?

Continue to wonder. The space economy is no longer theoretical. It's happening now. If we can unlock and use data effectively, we can build entirely new applications, industries, and opportunities.

Planetary Systems AI is part of that broader ecosystem, and our goal is simple: to be part of the solution—helping humanity navigate and thrive beyond Earth.

We're not building AI for the sake of AI—we're building autonomy in the intelligence layer that will make the space economy interoperable, and scalable at mission speed.



Launch + Spaceports



2026

Launch

Access to orbit = control of the space economy

Every downstream market depends on repeatable and reliable access to orbit. Launch capabilities control who reached orbit, how often, through which routes, with what reliability, and under what operating constraints. Satellite communications cannot become network capacity without deployment. Earth observation cannot become intelligence without sensors situated across orbits. Defense architectures cannot become resilient without assured launch. Space stations cannot run without continuous resupply missions. Launch cannot underwrite the entire ecosystem if access remains scarce or unreliable.

SpaceX remains the cadence center, but other US launchers are filling specialized lanes

Launch providers completed 97 successful launches through April 30th, in 103 attempts. SpaceX accounted for 52. All launchers combined sent up 1,607 payloads. SpaceX accounted for 1,275. 1,125 of those were Starlinks.¹ Most were sent up on Falcon 9 rockets, but SpaceX also provided another demonstration of its heavy-lift capabilities when Falcon Heavy completed its ViaSat-3 F3 mission in April.²

But the US launch market is not *only* a SpaceX story. Five other American launchers successfully filled specialized lanes in the overall launch ecosystem even if they don't challenge SpaceX on cadence.

Rocket Lab carried the small-launch and mission-diversity lane, providing trusted and reliable access for dedicated missions, customer-specific timing, and diversified payload classes that don't always fit the dominant rideshare or large-vehicle model. It continued its 100% success rate with 6 Electron missions carrying telecom, science, EO, navigation, and civil-government payloads.³

ULA also remained a major route for high-consequence military and commercial missions. Its Vulcan Centaur rocket successfully delivered national security spacecraft to a challenging geosynchronous orbit for the Space Force in February and Atlas V supported Amazon Leo's constellation deployment.^{5,6} Northrop Grumman's Minotaur IV filled a government technology-demonstration lane carrying carrying specialized national-security and experimental payloads for Department of War, Space Force, and

academic customers.⁷ Firefly Alpha also returned to flight, successfully completing its FLTA007 mission carrying a Lockheed Martin payload in March, a major validation milestone after recent challenges.⁴ Repeat performances will mean another provider able to assure dependable access.

This April, Boeing re-opened the human lunar-transport lane when its SLS Block 1 rocket and Orion spacecraft sent NASA and CSA astronauts around the Moon on NASA's Artemis II mission.⁸ Together, these lanes make the US market more complex than one leader plus a long tail. SpaceX set the baseline. Rocket Lab, Firefly, ULA, Minotaur, SLS, and Falcon Heavy serve specialized missions that support ecosystem resilience, customer choice, national security, human exploration, and mission-specific access.

China's industrializing rocket development and launch flow, but still chasing reusability

China continued its drive to industrialize national launch capabilities across vehicle families, with 6 different providers fielding 18 unique rocket variants to attempt 26 orbital launches through April 30. 23 of them were successful.¹ This included a successful maiden flight of CAS Space's Kinetica-2 orbital rocket in March, considered a cornerstone of China's "next-generation space cargo transportation system." Its primary payload was the Qingzhou Cargo Spacecraft Test Vehicle, a prototype lower-cost cargo ship intended to support resupply missions to China's Tiangong space station.¹³



All other constellations seeking to be infrastructure-scale cannot depend only on a single-provider access strategy.

China's reusable rocket aspirations have achieved mixed success so far this year.

February's low-altitude test flight of Long March-10 was China's first-ever successful first-stage booster maritime salvage and recovery mission, ending with a controlled sea splashdown of both the rocket's first stage and the Mengzhou return capsule.¹⁰ The test flight also signaled advancement in the country's crewed lunar exploration program.¹¹ In April, Space Pioneer's Tianlong-3 rocket commenced its maiden flight. The rocket is modeled after SpaceX Falcon 9 with a reusable first stage. But the launch vehicle diverged from its expected flight state between its first and second-stage startup, failing to deliver its payloads into their desired orbit. While this launch was not intended to test reuse, it's still a setback to the overall program.¹²

France and Russia spaceports hosted successful non-US/China routes to orbit

Russia remained an experienced operator with Roscosmos successfully completing 8 orbital launches using a mix of Soyuz, Angara, and Proton-M rockets.¹ They carried a wide mix of payloads, from undisclosed (but assumed to be) military spacecraft to internet broadband satellites in LEO for Bureau 1440. Soyuz-2-1a sent up multiple uncrewed cargo ships to resupply the ISS. On April 30th, Russia also succeeded in its first test flow of new medium-lift Soyuz-5 rocket, which carried a "GMM" experimental mass simulator / test payload.¹⁴

Europe's sovereign launch capabilities also strengthened alongside the industrial ramp-up of the Ariane 64 rocket. Arianespace successfully completed both of the first two missions ever of this new heavy-lift 4-booster rocket, delivering ~20 metric tons to orbit comprised of payloads for an important commercial customer (Amazon). This demonstrates its full-power capability and ability to meet the requirements of large-scale constellation deployments for international buyers. The missions were a signal that an EU-based launcher could provide a sovereign path to reliable orbital access for European government and commercial customers, reducing the regions reliance on US rockets.⁹

Reliability is the bridge from episodic activity to trusted infrastructure

Ariane 64 delivered 64 Amazon Leo satellites across two launches. They were the first Leo satellites sent up on a European launcher, and the commencement of an 18-mission contract between Amazon and Arianespace, solidifying their significant role in one of the space economy's largest megaconstellation deployment campaigns.⁹ But they weren't Amazon's only path to orbit. ULA also launched 2 batches of 29 Leo's into LEO on multiple Atlas V 551 missions in April.⁵

For Amazon, the strategic logic is straightforward: multiple routes reduce schedule concentration risk. Starlink relies on SpaceX's own rockets to drive deployment, all other constellations seeking to be infrastructure-scale cannot depend only on a single-provider access strategy. Large constellations create demand for launch capacity that must be available, reliable, compatible with payload production, and aligned with desired deployment timelines.

Launch activity only becomes trusted access when payloads reach the intended mission outcome

Customers need confidence that the vehicles they contract will reach the launchpad, enter orbit, and deploy their payloads with precision. By the end of April, multiple providers showed that this full checklist was still a work in progress.

In January, ISRO's PSLV (India) program faced its second consecutive failure when an anomaly with the third stage of the rocket resulted in the loss of all 16 payloads. This launch was a rideshare mission, with the loss disrupting the downstream missions of multiple commercial customers and international partners.¹⁵ In April, Blue Origin's 3rd launch of New Glenn successfully reached orbit and landed its first-stage booster back on Earth for further reuse once again. But it placed its payload, the BlueBird 7 satellite built to deliver D2D connectivity, in a significantly lower altitude than planned, causing it to be de-orbited and destroyed. The cost of the satellite was covered by insurance, but having no satellite in orbit delays AST SpaceMobile's service rollout and its battle with Starlink and others for D2D market share.¹⁶



2026

Spaceports

How Spaceports Can Leverage Federal Infrastructure Incentives

The commercial space industry is experiencing unprecedented growth, driving a critical need for expanded and modernized spaceport infrastructure. From accommodating heavier launch vehicles to processing a growing volume of payloads, the physical and logistical demands on spaceports are rapidly evolving. However, developers and operators face a unique funding challenge: there are currently no federal grant programs directed specifically at spaceport infrastructure.^{17,18}

Despite this absence of dedicated funding, a massive, untapped opportunity exists. By deconstructing a spaceport into its component parts—and recognizing its role as a regional economic engine—spaceports can strategically tap into the billions of dollars available through broader federal infrastructure and economic development incentives.¹⁸

Redefining the Spaceport Ecosystem

To capture federal funding, spaceports must look beyond the launch pad. A successful spaceport is a complex ecosystem that relies heavily on traditional infrastructure. It requires robust surface transportation for moving massive aerospace components, specialized aviation and maritime facilities for logistics, and a highly skilled technical workforce. By aligning these foundational needs with existing federal funding streams, spaceports can effectively subsidize their broader development goals.¹⁷

Key Avenues for Federal Funding

While the word "spaceport" may not appear in the notice of funding opportunity, the infrastructure that supports one often qualifies for major federal grants. Key areas of opportunity include:¹⁸

- **Roads, Bridges, and Rail:** The logistics of spaceflight require heavy transport capabilities that test the limits of local infrastructure. Federal programs—such as Better Utilizing Investments to Leverage Development (BUILD) or the Nationally Significant Multimodal Freight & Highway Projects (INFRA) program—are designed to improve freight mobility and regional connectivity.^{19,20}

Upgrading access roads, reinforcing bridges for heavy loads, or building rail spurs that service spaceport facilities are all highly competitive use cases for these funds.

- **Aviation and Maritime Facilities:** Many spaceports operate as dual-use facilities at existing regional airports or rely on nearby maritime ports for the delivery of large rocket components via barge. Spaceports can indirectly benefit from FAA Airport Improvement Program (AIP) funds or the Port Infrastructure Development Program (PIDP) by supporting upgrades to shared runways, taxiways, and port handling facilities.^{21,22}
- **Energy Grid and Electric Infrastructure:** Launch operations and advanced ground support equipment demand reliable power. Through the Department of Energy and broader infrastructure initiatives, substantial federal funding is available for grid modernization, clean energy deployment, and electric vehicle (EV) charging networks. By partnering with local utilities and state energy offices, spaceports can champion projects that upgrade regional substation capacity, enhance resilience, and electrify ground fleets. These upgrades secure the necessary power for spaceport operations while simultaneously improving the surrounding community's energy infrastructure.^{23,24}
- **Workforce Development:** Physical infrastructure is only half the equation; a spaceport cannot function without a highly specialized workforce of technicians, mechanics, and engineers. Federal agencies, including the Department of Labor and the Economic Development Administration (EDA), offer substantial grants for regional workforce training programs. Spaceports can serve as the anchor employer for these grant applications, driving the creation of local aerospace training pipelines.^{25,26}



The Imperative of Strategic Partnerships

Because spaceports are often not the direct eligible applicants for these traditional infrastructure grants, capturing these incentives requires a highly collaborative approach. Spaceports must position themselves as catalysts for regional economic development and partner with eligible entities to submit joint applications.¹⁸

To successfully navigate this landscape, spaceport authorities should build active coalitions with:

- **State Transportation Authorities:** Partnering with state Departments of Transportation is essential for securing large-scale freight, highway, and rail grants. Spaceports must integrate their logistical needs into the state's broader freight and transportation master plans.^{19,20}
- **Localities and Municipalities:** City and county governments are prime applicants for regional infrastructure and economic revitalization grants. Collaborating with local officials ensures that spaceport access projects are prioritized in local planning and grant applications.^{19,20}

- **Workforce Development Boards:** By teaming up with local workforce boards, community colleges, and universities, spaceports can co-design training programs that qualify for federal education and labor grants, ensuring a steady pipeline of local talent while bringing federal dollars into the community.^{25,26}

The lack of a dedicated "spaceport grant" is not a barrier to federal funding; rather, it is a call for strategic alignment. By recognizing that spaceports are fundamentally reliant on roads, rail, ports, and people, operators can partner with state and local entities to unlock existing infrastructure incentives. Through creative coalition-building and a broad interpretation of infrastructure, spaceports can secure the capital necessary to cement their place in the next generation of aerospace logistics.^{17,18}

NOTABLE DEVELOPMENTS: SPACEPORTS

FEB	• FAA cleared two major Starship/Super Heavy environmental steps: LC-39A operations at Kennedy Space Center and additional Boca Chica trajectories / landing profiles.^{28,29}
MAR	• The FAA moved commercial space license approvals fully under Part 450 to streamline the launch and reentry licensing process. The change reduces the number of times an operator needs an FAA license approval and allows one license for a portfolio of operations, different vehicle configurations and mission profiles, and even multiple launch and reentry sites. It is intended to provide more flexibility and more methods of compliance, reducing the administrative and cost burdens on industry and the FAA.²⁷ • Canada committed to sovereign launch infrastructure, including a 10-year spaceport lease structure near Canso, Nova Scotia and Launch the North awards for responsive light-lift development, furthering its sovereign access strategy.³⁰ • Launch infrastructure now includes cyber defense: Space Force hardened the US launch-range layer by creating Defensive Cyber Operations Squadrons for Space Launch Delta (SLD) 30 and SLD 45.³¹
APR	• Space Launch Delta 30 announced that Blue Origin was selected to continue in the process toward a real-property use agreement (lease) for SLC-14, effectively advancing them to exclusive negotiations for the site.³²



**Access to orbit is control of
the space economy — and
every downstream market
depends on launch that's
repeatable and reliable**



Satellites: Satcom

The space economy is still deploying communications infrastructure faster than any other satellite category.

The age of unprecedented scale

Between January and April, communications satellites continued to make up the majority of payload volume sent to orbit, accounting for 1,372 of 1,607 payloads (~85%). SpaceX remained the major deployer, with 1,125 Starlink sent to orbit, dwarfing the volume of every other communications constellation combined.¹ But Amazon Leo continued to increase its cadence faster than any other current or historical operator, orbiting another 122 payloads across four launches split between Ariane 64 and Atlas V.^{1,2,3} Amazon expects to have 700 Leo's in LEO by space by July 30, 2026, but that's not enough to meet its current FCC deployment deadline (~1,618), causing the company to request an extension to July 30, 2028.¹⁴ China's rival megaconstellations remain smaller by near-term launch volume but are adding a second source of scale pressure: Guowang deployed 32 satellites across four launches between January and April, reaching 168 operational LEO satellites, while Qianfan/Thousand Sails resumed launches in April with 18 satellites, bringing its total to 126.^{21, 22}

This race for scale will continue to heat up. Starlink received approval for 7,500 additional Gen2 satellites in January. Amazon secured approval for 4,500 Leo's in February.^{5,4} They're not the only with expansive plans. Blue Origin announced plans for a new 5,408-satellites LEO/MEO constellation called TeraWave and Logos Space secured FCC clearance for its own ~4,000 satellites network.^{9,10} For Chinese constellations, Guowang has plans to reach 310 satellites by year end in pursuit of its ultimate target of ~13,000 satellites, while Qianfan needs to launch at least 90 more satellites to hit their target baseline of 108 satellites per year as they build towards their goal of a 15,000 satellite constellation by 2030.^{21,22}

	Satellites Launched Jan1-Apr30	Total Satellites Deployed as of Apr30	Total Planned Satellites
SpaceX Starlink	1,125	11,926	42,000
Amazon Leo	122	302	7,736 (by 2035)
SatNet Guowang	32	168	13,000
Spacesail Qianfan	18	126	15,000 (by 2030)
Blue Origin TeraWave	0	0	5,408
Logos Space Logo	0	0	4,178 (by 2035)

The competitive battlegrounds

The scale pressure set by Starlink is splitting the rest of the market into more specialized lanes. Emerging and legacy satellite operators are both finding market segments and spectrum strategies that give them advantages scale alone can't overcome.

Enterprise and Sovereign Segments

Satellite operators are building points of differentiation around resilience, security, route diversity, and data-center integration to win contracts with enterprise and nation-state customers.

Blue Origin's announced the development of a new multi-orbit constellation called TeraWave in January explicitly designed to serve 100,000 enterprise and government customers.⁹ Logos Space, founded by former Google and Starlink executives also rolled out plans for a new network "purpose-built for enterprise and government users" featuring jamming-resilient, EW-resistant connectivity.¹⁰

Northwestel and Telesat also added sovereign-infrastructure lanes. On March 17, Telesat added military Ka-band spectrum to its satellites to meet surging demand for sovereign communications.¹¹ Then, on April 2, 2026, Northwestel and Telesat formalized a multi-year contract for Telesat Lightspeed LEO satellite services to deliver sovereign broadband connectivity to communities across Northern Canada.¹²

Legacy operators such as Eutelsat OneWeb, SES, and Viasat are also increasingly repositioning around enterprise, government, aviation, maritime, and sovereign connectivity requirements; all areas where multi-orbit architectures, regulatory alignment, and service guarantees matter more than subscriber volume.



The battle for the pocket – direct-to-device (D2D)

Satellite companies are also pursuing D2D connectivity through a variety of strategies. AST SpaceMobile is entering the market through carrier partnerships that leverage existing mobile network operator (MNO) infrastructure and spectrum and infrastructure. In April, AST received FCC authorization for a 248-satellite supplemental-coverage constellation, enabling them to provide D2D services via previously signed commercial agreements with Verizon, AT&T, and FirstNet.⁶

Lyng Global is also working on deploying its own constellation while simultaneously negotiating MNO integrations. Also in April, Lyng announced its 640-satellite constellation would begin service in 2027, while awaiting regulatory approval of its merger with Omnispace – another D2D startup - and an expected investment from SES.⁸

Amazon, which previously had not announced D2D plans for Leo, also made a significant move in April with an agreement to acquire Globalstar's satellite operations, ground infrastructure, and MSS spectrum assets.⁷ Paired with an Apple-related satellite-connectivity agreement disclosed with the transaction, the deal positions Amazon to buy rather than negotiate its way into snagging share of the D2D market. While the transaction does immediately make Amazon an active provider of D2D services, it does change Leo's option set by securing spectrum, ground assets, satellite operations, and device ecosystem relationships should the deal close.



Scale doesn't matter if you don't have enough allocated to provide services

The spectrum advantage

Securing and defending spectrum rights through MNO partnerships or M&A has become a critical component of competitive advantages for these competing constellations. Scale doesn't matter if you don't have enough allocated to provide services. Amazon's bid to acquire Globalstar comes with valuable spectrum rights and follows significant spectrum-only acquisitions by SpaceX and AST SpaceMobile last year.

The FCC has also been evolving spectrum regulations to support industry development and competition. On April 23, the FCC rejected petitions from SpaceX, Kepler Communications, Sateliot, and AST SpaceMobile requesting access to Mobile Satellite Services spectrum, reaffirming that incumbents Iridium and Globalstar retain exclusive rights to the Big LEO bands (1.6–1.7 GHz). The FCC concluded that spectrum-sharing the Big LEO is impractical due to significant harmful interference challenges and explicitly said it wants to protect the "investment, growth, and innovation afforded in the current Big LEO structure".¹³ Without regulatory sharing, it is clear that spectrum will remain a key bottleneck. But the FCC did approve new satellite spectrum-sharing rules on April 30th that allow LEO operators to use higher power in the 10.7–12.7 GHz, 17.3–18.6 GHz, and 19.7–20.2 GHz bands. Geostationary operators – who operate orbit satellite systems flying higher than LEO constellations – strongly opposed these changes, citing potential interference with their systems due to larger power outputs.¹⁵

Securing the supply chain

Alternatively, if you have spectrum, but don't have enough satellites in orbit, that's also a problem. So is having satellites but not being able to safely send them into orbit.

Launch remains a key barrier for all operators other than Starlink, which has cadence and cost advantages through SpaceX's Falcon 9 flights. Amazon has cited access bottlenecks as cause for missing Leo deployment deadlines.¹⁶ They have recently accelerated deployment by leveraging multiple launch providers, but the recent sidelining of two next-gen, heavy-lift vehicles in ULA's Vulcan and Blue Origin's New Glenn following February and May anomalies threatens to slow things down again.¹⁷ These setbacks only increase ecosystem reliance on SpaceX, underscoring the competitive advantages of integrated launch and constellation capabilities.

Beyond launch access, reliance on highly specialized third-party suppliers has recently created severe time-to-market risks across the broader space supply chain. In March, Telesat delayed the full commercial launch of its Lightspeed constellation to the first quarter of 2028 due to readiness issues with custom ASIC chips developed by its supplier, SatixFy.¹⁸ This has led to increasing M&A as competitors continue to acquire key suppliers. In April 2026, Phantom Space Corporation acquired Thermal Management Technologies to support its Phantom Cloud orbital data center constellation by bringing thermal engineering expertise in-house.¹⁹ Later in April, Rocket Lab completed its acquisition of Mynaric, adding laser optical communications terminals to its space-systems portfolio.²⁰



Satellites: EO



Earth observation

The Earth observation industry is evolving as commercial clients increasingly want persistent monitoring and decision-ready answers rather than isolated images. This shift toward subscription-based intelligence—combining imagery, automation, and analytics for continuous awareness—is reshaping satellite design and deployment. To deliver faster outputs, the industry is converging on an AI-native stack that processes data at the edge and fuses multi-source data into action-oriented outputs. This evolution has supported growth in a new supply chain, with digital marketplaces for components and hosted compute platforms lowering barriers to entry. Non-optical sensors like SAR and RF intelligence are maturing beyond niche use cases, now embedded in commercial workflows. Earth observation is increasingly about understanding the planet, not just capturing images.

From images to intelligence

The Earth observation industry has begun to rearchitect its business model, moving away from selling raw pixels toward delivering persistent, subscription-based global intelligence. Commercial and government clients increasingly demand continuous monitoring and fast, decision-ready answers, prompting providers to combine imagery, automation, and analytics into always-on data streams.

A prime example of this transition is EarthDaily, which announced a new eight-figure data subscription agreement with a US defense technology company on April 9. Rather than selling one-off snapshots, EarthDaily is purpose-building its constellation to deliver "consistent, repeatable measurement at global scale." By capturing tens of millions of square kilometers of daily images with strict calibration, the system operates as a persistent, daily time-series of the exact same locations. This continuous, highly standardized data stream eliminates the noise found in ad-hoc imaging, creating the reliable baseline necessary to train AI models to autonomously detect changes over time.¹

The commercial viability of this persistent monitoring model is reinforced by HawkEye 360, which matured to the point of filing an S-1 prospectus on April 10 ahead of their IPO in May. HawkEye 360's model does not center on one-off signal detections; instead, customers subscribe to recurring RF signal data feeds to track maritime and ground activity across congested areas over time.²

Major optical players are making similar structural shifts by deploying the infrastructure required for continuous subscriptions. Satellogic formally launched its Aleph Observer platform to replace legacy ad-hoc tasking with predictable, daily monitoring of critical sites in February.³ To enhance this platform, on March 18, 2026, Satellogic announced its Merlin constellation, which is designed to remap the entire planet daily at one-meter resolution. This system would empower Aleph Observer to provide continuous global awareness, monitoring millions of locations simultaneously and cementing the company's transition from task-based imaging to a continuous intelligence model.⁴

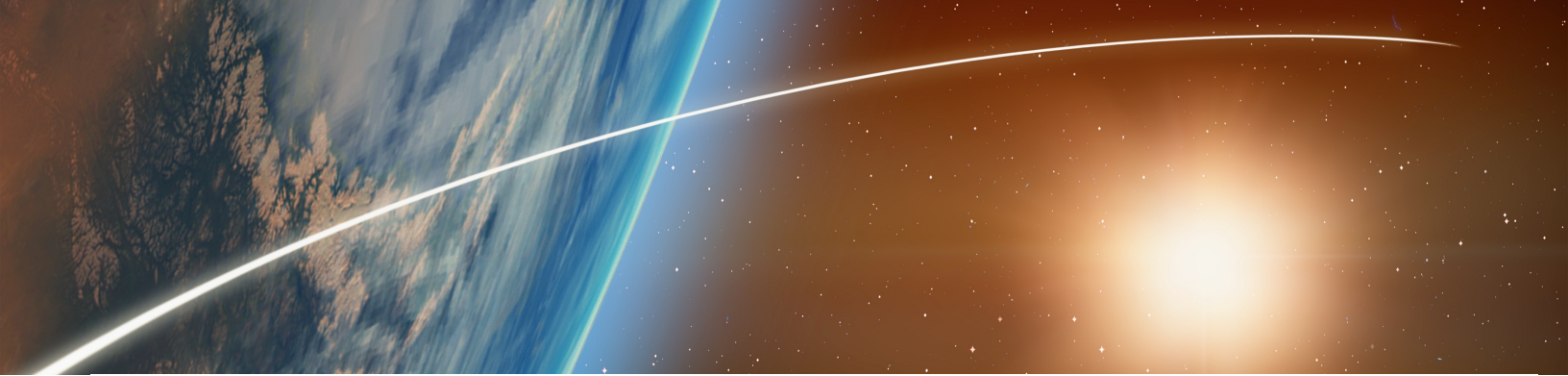
Rewiring the hardware

To meet the commercial demand for instant intelligence, the space industry is converging on an AI-native stack that optimizes the entire data pipeline from orbit to ground.

GPU-native processing + generative enhancement

Ground pipelines are increasingly transitioning from CPU-based infrastructure to GPU-accelerated workflows to handle massive data lakes and computationally enhance imagery. On March 16, 2026, Planet Labs announced a collaboration with NVIDIA to apply the CorrDiff AI generative model to its PlanetScope imagery archive. This allows Planet to super-resolve data, extracting new levels of detail and delivering analysis-ready insights in seconds instead of hours using GPU-accelerated processing.⁵

Additionally, the evolution of generative models for Earth observation was highlighted on April 13, 2026, with the publication of research on HuiYanEarth-SAR. Instead of relying on traditional, computationally intensive SAR scene simulation, this model leverages deep learning based on AlphaEarth with integrated scattering mechanisms, generating high-fidelity SAR images from geographic coordinates alone by embedding geospatial priors and scattering physics into the generative process. This research points to how generative models could enhance and/or supplement conventional remote sensing workflows by producing high-quality, simulation-ready SAR data at lower cost.⁶



On-orbit AI inference

Satellites are actively shifting compute directly to the edge, drastically reducing the latency and bandwidth costs of downlinking raw files. On March 16, 2026, Kepler Communications commissioned its first distributed on-orbit computing network. Using NVIDIA Jetson Orin modules across 10 interconnected satellites, Kepler's network acts as a space-based edge compute fabric capable of routing and acting on data directly in orbit.⁷ Similarly, on April 7, 2026, Planet announced that its Pelican-4 satellite successfully captured an image over Australia on March 25 and ran an onboard AI model to detect airplanes in moments. Additionally, On April 9, EDGX announced that STERNA, its AI-powered edge computer, had launched aboard SpaceX's Transporter-16 mission to demonstrate space-grade, real-time data processing.⁸

Action-oriented datasets

The ultimate goal of this hardware rewiring is fusing multi-source data into decision-ready outputs that drive autonomous workflows. On March 12, 2026, EarthDaily achieved CEOS Analysis Ready Data compliance, ensuring its satellite data is immediately usable for AI workflows without requiring end-users to process raw imagery.⁹

On April 7, 2026, L3Harris and Xoogle announced the co-development of a space-borne measurement system specifically optimized for the AI era. Their constellation is designed to feed reliable ground-truth data directly into autonomous AI systems as they shift toward agentic workflows.¹⁰

Lastly, this push for analytics-ready data was further reinforced on April 14, 2026, when Slingshot Aerospace launched Slingshot Portal, an AI-native platform that unifies third-party mission data into a single operational process for faster decision making.¹¹

Ecosystems and marketplaces

Scaling advanced orbital hardware requires a new foundation, driving the commercialization and modularization of the satellite supply chain. Historically, deploying a custom constellation demanded billions of dollars, but new digital marketplaces and "Space-as-a-Service" frameworks are lowering the barrier to entry.

For example, on March 30, 2026, Spire Global successfully launched ten multipurpose satellites, including four dedicated to expanding Myriota's IoT network and two custom payloads for a Space Services customer. By leveraging Spire's end-to-end manufacturing and ground infrastructure, these clients bypassed massive capital expenditures to deploy custom sensors rapidly.¹² Concurrently, prime contractors are aggressively rolling up the supply chain to eliminate third-party component bottlenecks. On March 12, 2026, York Space Systems acquired Orbion Space Technology, a manufacturer of flight-proven electric propulsion systems. By integrating propulsion manufacturing in-house, York mitigates supply-chain risks and ensures its standardized satellite platforms can meet the high-volume scaling demands of both commercial and national security clients.¹³

Maturation in commercial workflows

The value of this modernized space stack is realized when advanced, non-optical sensing is seamlessly integrated into everyday business workflows. Technologies like Synthetic Aperture Radar (SAR) and Radio Frequency (RF) monitoring enable 24/7 visibility regardless of weather or daylight. In the commercial sector, ICEYE partnered with insurance giant AXA DCP on January 21, 2026, to utilize high-resolution SAR data for tracking extreme weather events, effectively transforming catastrophe response strategies.¹⁴ ICEYE expanded this commercial utility on March 3, 2026, by launching a SAR-powered deforestation monitoring solution that allows law enforcement to track illegal logging and mining directly through persistent Amazonian cloud cover.¹⁵

RF sensing is similarly maturing from a niche defense application to a scalable utility. On March 2, 2026, HawkEye 360 secured a European Ministry of Defense electronic warfare program valued at up to \$75 million to monitor GPS interference and air defense activity.¹⁶ This capability was made even more accessible when Spire Global successfully demonstrated single-satellite RF geolocation for S- and X-band signals on March 24, 2026, eliminating the historical need for multi-satellite formations to track critical radar and navigation systems.¹⁷

Spotlight:

Orbital Data Centers (ODC)

The next inflection point in digital infrastructure will not arrive quietly in a hyperscale campus or a new semiconductor fab. It will arrive overhead.

Orbital Data Centers (ODCs) represent a structural shift in how compute, energy, latency, resilience, and sovereignty intersect and in doing so, they redefine the boundaries of the space economy itself. This is not a story about novelty or science fiction. It is a story about infrastructure moving to where physics, economics, and strategy align better than they do on Earth. The leaders who recognize this early will not simply adopt a new technology; they will shape a new layer of competitive



Figure 1: Space infrastructure as an advantage¹

Market Snapshot

The Orbital Data Center market is rapidly shifting from concept to competitive positioning, with a small set of players quietly shaping its structure before enterprise demand fully materializes. SpaceX is closest to operational reality, leveraging its Starlink constellation and launch scale to potentially embed compute directly into its network, collapsing layers and capturing higher-value workloads; Blue Origin is pursuing a longer-game infrastructure model, focusing on serviceable, persistent in-orbit platforms that redefine capital efficiency and

lifecycle economics; Amazon, through Amazon Leo and AWS, is positioned to abstract orbital compute into familiar cloud primitives, effectively making orbit another availability zone for enterprises; meanwhile, emerging players like Starcloud are designing purpose-built, compute-first architectures optimized for energy and thermal performance in space, likely accelerating innovation through partnerships or acquisition. At the same time, China is advancing a sovereign, vertically integrated approach treating orbital compute as national infrastructure and aligning satellite networks, AI, and data control into a unified stack. Together, these moves signal three realities: convergence across launch, connectivity, and cloud is inevitable; early access to orbital capacity, power, and regulatory positioning will create durable advantage; and long-term value will accrue not to infrastructure alone, but to those who control the orchestration layer where data becomes insight.

From “Cloud on Earth” to “Cloud in Orbit”

For decades, enterprise computing followed a gravity-bound logic: build where land, power, water, and connectivity intersect. That logic is beginning to break. Artificial intelligence has exposed hard limits in terrestrial infrastructure power availability, grid resilience, cooling efficiency, land access, and regulatory friction. Global data center electricity consumption is rising toward levels comparable to industrialized nations, while climate volatility and geopolitical risk increasingly threaten continuity.²

Orbital Data Centers alter this equation. By collocating compute with space-based data sources Earth observation, communications, and positioning systems ODCs reduce latency, eliminate repeated downlink constraints, and shift analytics closer to the point of signal generation.³ More importantly, they introduce a fundamentally different infrastructure profile: continuous access to solar energy, radiative heat rejection unconstrained by water scarcity, and geographic independence from any single terrestrial jurisdiction.⁴

This is not about replacing hyperscale cloud. It is about extending it, treating orbit as another strategic availability zone, purpose-built for workloads where latency, resilience, sovereignty, and bandwidth economics dominate.⁵

Orbital Data Centers are not “space infrastructure for space companies.” They are enterprise infrastructure for AI driven industries.

The first order effect of ODCs is technical: faster insight, reduced bandwidth costs, and new operating models like Space as a Service. The second order effect is strategic and far more consequential: orbit becomes strategic infrastructure. When compute moves into orbit, space transitions from a data source to a decision layer. Orbit becomes active digital infrastructure, not passive hardware. This reshapes multiple dimensions of the space economy at once.

First, the value chain shifts downstream.

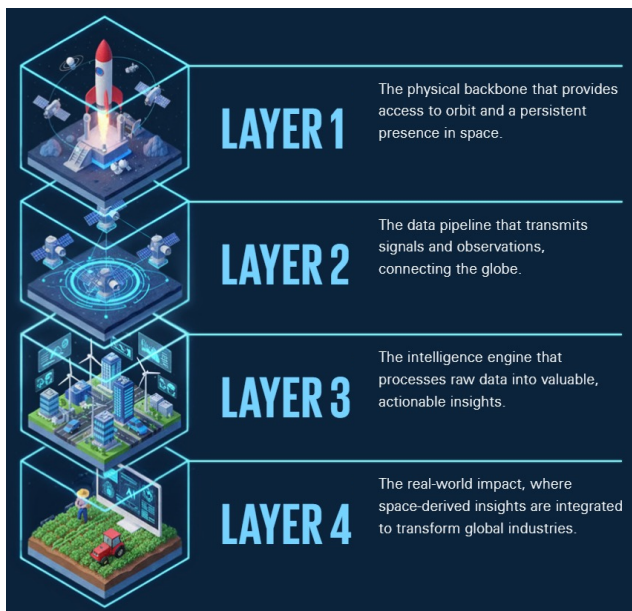


Figure 2: The four layers of the space economy ⁶

As outlined in +Space Tech, infrastructure (Layer 1) and data (Layer 2) increasingly commoditize, while intelligence and applications (Layers 3 and 4) capture disproportionate value. ⁶ ODCs accelerate this shift by enabling in orbit AI inference, multi-sensor fusion, and autonomous decision making. Processing moves from pixels and packets to prioritized insight reducing latency from hours to minutes or seconds in missions like disaster response, maritime monitoring, and space domain awareness. ⁷

Second, energy becomes a strategic differentiator, not a constraint.

Continuous solar availability and radiative cooling make orbit one of the few environments where AI scale does

not immediately collide with grid capacity. Academic studies suggest orbital platforms could achieve energy usage effectiveness ratios materially better than terrestrial data centers, with no dependence on freshwater or land-intensive cooling. ⁸ This reframes sustainability from mitigation to architecture an entirely different conversation for boards and regulators.

Third, sovereignty and resilience are redesigned.

ODCs offer sovereign partitions, cryptographic separation, and jurisdiction-aware architectures by design rather than by retrofit. In a world where data access can be restricted overnight and terrestrial infrastructure disrupted by cyber or physical events, Earth independent compute becomes a resilience asset, not a redundancy. ⁹

Why this matters beyond space

Orbital Data Centers are not “space infrastructure for space companies.” They are enterprise infrastructure for AI driven industries.

Financial services depend on precise timing and resilient compute. Energy and utilities depend on continuous situational awareness. Agriculture, insurance, and logistics increasingly depend on real time Earth intelligence. Defense and critical infrastructure depend on autonomy under contested conditions. In each case, the limiting factor is not data availability; it is latency, resilience, and the cost of moving raw information through constrained terrestrial networks. ¹⁰

This is where ODCs quietly change the rules. By processing data in orbit, enterprises shift from bandwidth heavy architectures to insight efficient ones. Spectrum scarcity becomes manageable. Ground infrastructure becomes complementary rather than critical. Entire new business models pay per insight, autonomous monitoring, sovereign analytics become viable. ¹¹

The result is a market transition like the early days of cloud computing: at first, specialized; then inevitable; finally, invisible. Most organizations will not say “orbital compute” in daily operations. They will talk about uptime, cost curves, regulatory confidence, and faster decisions. Orbit will simply be part of how the system works.



“The next advantage won’t come from faster networks alone—it will come from how quickly organizations can move compute to where energy, physics, and autonomy align. Orbit isn’t a destination. It’s becoming a decision layer.”

– Brian Miske, US (Americas Space Lead), KPMG LLP

Leadership at the edge of everywhere

The central question for CEOs, CIOs, and CTOs is not if Orbital Data Centers will mature it is who moves early enough to shape standards, economics, and governance.

As explored in Latency to Leadership, inflection points do not reward passive optimization. They reward leaders who recognize constraints early and redesign systems before scarcity becomes crisis.¹² ODCs sit precisely at that threshold: technically viable, economically plausible, and strategically differentiating but not yet commonplace.

Today’s competitive edge is not just about fast networks, it’s about speed to orbit, speed to compute, and speed to harness energy. Infrastructure has evolved into a strategic asset, now reaching beyond Earth itself. As launch rates rise and orbital capacity grows, early movers gain lasting advantages. Securing launch windows, orbital space, and power early creates structural benefits that latecomers can’t easily match. Enterprise IT is transitioning from cloud regions tied to

geography toward integrated terrestrial and orbital stacks built around physical principles. In this landscape, the pace of decision-making is critical. Leaders who invest in capital, forge partnerships, and take risks before consensus emerges will distinguish themselves from those who wait for certainty that may never come.

Space organizations employ top engineering talent to tackle technical challenges. However, their obstacles today are not technical but economic, architectural, regulatory, and organizational. This is where strong leadership becomes essential.

Organizations that act now by launching pilots, forging partnerships, and architecting for orbit will not merely adapt to orbital computing they will define how power, sovereignty, and value are structured across the next era of the space economy. Leadership in the decade ahead will belong to those who realize that the most consequential infrastructure decisions are no longer grounded—and have the courage to move while others hesitate.



Notable Developments

Jan	• FCC authorizes SpaceX to deploy additional 7,500 Gen2 Starlink satellites (15,000 total authorized). ¹ • Blue Origin announces “TeraWave,” a 5,408-satellite LEO/MEO enterprise connectivity network. ² • India EO-PPP: Pixxel-led “Allied Orbits” signs agreement with IN-SPACe for privately built/operated multi-sensor EO constellation. ³ • SpaceX files FCC application for “Orbital Data Center system” of up to 1,000,000 satellites. ⁴
Feb	• SpaceX acquires AI startup xAI in all-stock transaction valuing combined entity at roughly \$1.25 trillion, citing orbital data centers as major strategic rationale. ⁵ • FCC Space Bureau accepts SpaceX's application for “Orbital Data Center system” of up to 1,000,000 satellites and opens comment cycle. ⁶ • Satelloptic launches “Aleph Observer,” persistent monitoring offering designed to replace ad-hoc tasking with daily, predictable monitoring of hundreds of sites. ⁷ • Arianespace launches 32 Amazon Leo satellites on the first Ariane 64 mission. ⁸
Mar	• Telesat announces Lightspeed service timing slipped to approximately end of Q1 2028 due to ASIC delays, adds Mil-Ka spectrum to initial constellation. ⁹ • Planet partners with NVIDIA to build a GPU-native AI engine for EO analytics. ¹⁰ • Satelloptic introduces “Merlin” constellation, designed to enable daily global remapping at one-meter resolution. ¹¹ • Blue Origin files FCC application for “Project Sunrise” (proposing up to 51,600 satellites for orbital AI data centers). ¹²
Apr	• Phantom Space acquires component supplier Thermal Management Technologies to support planned orbital data center development. ¹³ • Planet successfully executes AI-driven object detection directly onboard its Pelican-4 satellite using NVIDIA Jetson Orin module. ¹⁴ • Xoople and L3Harris announce collaboration to develop “Earth AI” constellation focused on calibrated space measurement systems. ¹⁵ • Rocket Lab secures multi-launch contract with IQPS for three dedicated Electron missions to support SAR constellation buildout. ¹⁶ • Sophia Space and Kepler Communications announce strategic partnership to deploy edge compute nodes on Kepler satellites starting with late 2026 demonstrations. ¹⁷ • Amazon announces definitive merger agreement to acquire Globalstar's satellite operations and spectrum assets, concurrently announcing agreement with Apple to support satellite connectivity features for compatible iPhones and Apple Watches. ¹⁸ • FCC grants AST SpaceMobile commercial authority for up to 248 satellites and direct-to-device supplemental coverage using partner carrier low-band spectrum (Verizon, AT&T, FirstNet). ¹⁹



**Orbital data centers aren't
space infrastructure for
space companies — they're
enterprise infrastructure for
the AI era.**

Interview: BlackStar Orbital



COSMOS INTERVIEW: Blackstar Orbital

Space should be for everyone

Inside Blackstar Orbital's Vision for a Reusable Future with
Founders: Christopher Jannette, CEO and Sean Hollis, COO



Blackstar Orbital's mission is to make space reusable, accessible, and scalable by building runway-returning spacecraft that transform orbit from a disposable economy into reliable infrastructure for science, security, and commerce.

What was the founding vision behind Blackstar Orbital, and what problem are you solving?

Blackstar was founded on a simple observation: today's space economy is largely disposable. Billions of dollars in satellites and orbital hardware are replaced because they cannot be serviced, returned, or reused at scale. That model would be unacceptable in aviation, logistics, or almost any other major industry.

Our vision is to help transition space into a cyclical, reusable economy. Instead of treating orbital hardware as one-time-use infrastructure, we are building reusable spacecraft - what we call space drones - that can operate in orbit, return to Earth, be refurbished, and fly again. Reusability is the unlock for a scalable 21st-century space economy.

What exactly is a "space drone," and how does it differ from traditional spacecraft?

The Blackstar SpaceDrone is a reusable, spaceplane-like vehicle designed to transport payloads to and from orbit. Unlike capsule-based systems, which return ballistically at high G and require ocean or desert recovery, our system is designed for controlled runway landings.

- That architecture provides several advantages:
- Rapid turnaround - potentially within 48 hours

- Lower refurbishment cost compared with building or replacing orbital hardware
- Ability to "hot swap" payloads between missions

We have drawn from aerospace, automotive, and robotics best practices to make these vehicles manufacturable at scale, which is essential for making orbital reuse economically meaningful.

Where does the immediate demand for your technology come from?

Today, our strongest demand signal is high-value return logistics, also known as downmass. This includes:

- Bioreactor and biomedical payloads
- Research conducted in microgravity that must return to Earth
- Defense, Space Force, and national security applications

We are building government relationships while developing a strong commercial pipeline, including more than \$100 million in indicated customer interest and partnerships across sectors such as biotech.

How do you see government and commercial markets evolving over time?

In the near term, we see government - particularly defense and national security - remaining a significant driver. Over time, however, growth will come from a balanced dual-use model spanning government, commercial, and eventually consumer markets.

We expect the market to expand rapidly as programs like Artemis, commercial space stations, and increased private-sector investment unlock new use cases. As demand for return logistics grows alongside on-orbit manufacturing and research, the total addressable market could approach trillion-dollar scale.

What commercial use cases become possible with reusable space drones?

Reusability unlocks applications that are difficult, expensive, or impossible under a disposable model, such as:

- Recurring biomanufacturing missions (e.g., protein crystallization and pharmaceuticals)
- Earth observation with dynamic orbits, including VLEO-to-LEO transitions
- In-space R&D with rapid iteration cycles
- Multi-revenue missions that combine payloads in a single flight

Over time, reliable return capability can enable entirely new industries in advanced materials, medicine, and space-based manufacturing.

Blackstar also offers “space as a service.” What does that look like for customers?

We operate across three business lines: government, commercial, and consumer services.

Space Box is one example: an accessible, on-demand service for enterprise payloads and consumer experiences. Customers can send items to space and return them, with pricing based on payload mass, complexity, orbit, and mission requirements.

At its core, Blackstar aims to provide the logistics layer for space: access, transportation, and return capability for virtually any payload.

What are the key innovations enabling this model?

Four major advances make Blackstar possible:

- Material science - improved thermal-protection systems for reusable reentry
- AI-enabled engineering - faster design, simulation, and iteration
- Miniaturized hardware - powerful, compact avionics replacing legacy systems
- Experienced talent - teams with backgrounds across programs such as Starship and Orion

Together, these advances allow us to build reusable systems that are technically viable, manufacturable, and economically scalable.



What are the biggest barriers to scaling a reusable space economy?

The challenges fall into a few key areas:

- Capital intensity and time required to reach orbit and prove the model
- Regulatory frameworks that are not yet optimized for reusable systems
- Manufacturing scale-up for vehicles, ground systems, and supporting infrastructure
- Access to capital markets for deep-tech companies

The inflection point is demonstration. Once reusable return missions are proven, perception, customer adoption, and capital access can accelerate rapidly.

From disposable to reusable space:

BlackStar Orbital is redefining the space economy by replacing one-time-use satellites with reusable “space drones” that can operate, return, and relaunch—unlocking a scalable, aviation-like model for space.

Reentry unlocks new markets:

Reliable return from orbit enables high-value use cases—from biomanufacturing and microgravity R&D to defense applications—creating entirely new commercial industries.

“Uber for Space” democratizes orbit access:

With a platform approach likened to an “Uber for space,” BlackStar aims to democratize access—allowing governments, enterprises, and eventually consumers to send and return payloads on demand.



What milestones are critical in your roadmap?

In the near term, our focus is flight validation as we progress through key technical milestones: drop testing, supersonic release testing, reentry validation, and then a full orbital mission demonstration. Reliable reentry and repeat use are the critical proof points; once those are demonstrated, the path to scaled operations becomes much clearer.

Where do you see Blackstar in 3, 5, and 10 years?

Our goal is to scale aggressively over the next decade. Within three years, we are targeting a fleet of approximately 30 vehicles and roughly \$450 million in revenue opportunity. By the five-year mark, we aim to expand toward approximately 300 vehicles and a multibillion-dollar revenue base. Looking ahead 10 years, we envision operating thousands of reusable spacecraft and supporting a business that could exceed \$40 billion. Ultimately, our long-term vision is to replace one-time-use satellite architectures with fleets of reusable, hypersonic spacecraft operating continuously between Earth and orbit.

Anything else you'd like COSMOS readers to take away?

Space is transitioning from a niche domain into critical global infrastructure - economically, scientifically, and strategically. It is essential to national security, scientific leadership, and the quality of life enabled by GPS, communications, weather data, Earth observation, and other orbital systems.

Blackstar's mission is to make that future reusable, accessible, and scalable. Space should not be limited to governments and large corporations; it should be available to everyone.

“Blackstar Orbital exists to end the disposable space economy. When spacecraft can launch, operate, return, and fly again, orbit becomes infrastructure - not a one-way trip - and that unlocks entirely new markets in science, security, and commerce.”



Destinations: Moon



2026

Moon

Artemis II and the New Space OS

When Artemis II lifted four astronauts around the Moon on April 1, it did more than mark humanity's first crewed journey into deep space in more than 50 years. It sent a far more important signal to the market: the Moon is no longer just a destination. It is becoming a platform.^{1,2} For CEOs, that distinction matters. Platforms change industries. Platforms create standards, ecosystems, dependencies, new profit pools, and new forms of competitive advantage. What Artemis II illuminated is that a new operating environment is taking shape in front of our eyes; a Space OS composed of logistics, infrastructure, rules, communications, navigation, energy, and commercial services that will increasingly shape how value is created both beyond Earth and back on it.^{3,4}

This is the real HALO effect of Artemis II. The mission gave the world a visible, emotionally resonant proof point that deep-space operations are moving from aspiration to execution. Artemis II also validated space as more than a government-only story. NASA's Artemis campaign now sits on a supply and partner network of >2,700 suppliers spanning primes, NewSpace providers, advanced manufacturers, and software solutions.^{5,6} Unlike Apollo, which was historic but episodic, Artemis is designed to be sustained - and sustained systems create commercial markets. That is why the mission should matter not only to aerospace leaders, but to executives in energy, telecom, manufacturing, private capital, mobility, and national security. The Moon is becoming a forcing function for a broader industrial reset.

At the center of that reset is infrastructure.

Water ice at the lunar south pole is strategically important because it could eventually support life support, oxygen production, and propellant creation turning the Moon into a refueling and staging node rather than a one-time expedition site. NASA's ISRU strategy, NASA technical work on lunar water-mine sites, and USGS lunar resource mapping all point to the same conclusion: lunar resources are no longer science fiction; they are becoming part of economic planning.^{7,8} In parallel, OSTP has moved to formalize the foundations of cislunar operations reference systems, communications, positioning, navigation, timing, and the equivalent of "lunar GPS."⁹ That is what a Space OS looks like in practice: not one machine, but a stack of enabling systems that others will build on.

With every new operating system comes a contest over who defines the rules.

The Artemis Accords have acquired 67 signatories. It's becoming the governance scaffold for interoperable, peaceful, and commercially meaningful activity beyond Earth.¹⁰ These sorts of standards shape markets. Whoever helps define how assets are registered, how interference is resolved, how navigation is standardized, and how safety is maintained will not just participate in the next economy but influence its architecture. In that sense, Artemis is as much about regulatory authorship as it is about exploration.¹¹

That is why the biggest strategic opportunities may now sit in the least glamorous layers: orbital logistics, cislunar communications, relay networks, digital engineering, robotics, cybersecurity, advanced power, and data infrastructure. 3GPP's continuing work on non-terrestrial networks underscores that standards for satellite-enabled connectivity are still evolving, even as commercial deployment accelerates. The lesson for CEOs is simple: value will not accrue only to those who build rockets. It will accrue to those who build the systems that others must depend on.

There are also risks that leadership teams should not underestimate.

A maturing Space OS will require traffic management, debris governance, spectrum coordination, resilient cyber architectures, and a workforce capable of building and operating highly complex systems at scale. OSTP's cislunar action plan explicitly calls for extending space situational awareness and implementing interoperable communications and PNT capabilities. Meanwhile, the aerospace and defense workforce faces a mounting retirement and skills cliff, with industry studies warning of structural shortages in advanced manufacturing, engineering, and technical trades. The companies that move now to shape standards, secure talent, and build adjacency into the stack will be better positioned than those waiting for the market to "settle."

That is the Artemis II HALO effect. The Moon has captured public imagination, but the real story is not symbolism. It is systems. A new operating environment is emerging above us, around us, and increasingly through us. The CEOs who win in this next era will not be the ones who admire the Moon. They will be the ones who recognize that a Space OS is being built now and decide where, in that stack, they intend to lead.



Destinations: Space Stations

2026

Space Stations

Government Space Stations

From January through April 2026, government-led space station activity was defined by continuity, contingency management, and long-term national capability building. The ISS continued to operate as the primary US-led microgravity research platform, supported by crew rotation and cargo resupply missions as NASA prepares for eventual transition to commercial space stations in the 2030s.

China's Tiangong program demonstrated operational resilience following the Shenzhou-20 spacecraft issue in 2025, while India's Bharatiya Antariksh Station advanced from concept toward industrial execution through early module-development activity and a clarified path toward BAS-01 and eventual 2035 operations.

Key developments by station

International Space Station	- NASA's SpaceX Crew-12 launched on Feb. 13, 2026, carrying NASA astronauts Jessica Meir and Jack Hathaway, ESA astronaut Sophie Adenot, and Roscosmos cosmonaut Andrey Fedyayev for a long-duration ISS science expedition.¹ - On Feb. 27, NASA reported that a SpaceX Dragon returned to Earth with several thousand pounds of science experiments and lab hardware after a six-month stay at the ISS.² - A Cygnus XL cargo spacecraft launched on Apr. 11 and arrived at the ISS on Apr. 13, delivering roughly 11,000 lb of supplies and research equipment.³
Tiangong Space Station	- The damaged Shenzhou-20 spacecraft returned to Earth uncrewed on Jan. 19, 2026, after suspected space-debris damage made it unsafe for crew return.⁴ - China reportedly extended the Shenzhou-21 crew's stay beyond the typical six-month rotation by about one month to maximize scientific and operational output aboard Tiangong.⁵ - Tiangong adjusted its altitude on Apr. 30 to prepare for Tianzhou-10's automated arrival, which was scheduled for May.⁶
Bharatiya Antariksh Station	- In January, ISRO / VSSC invited Indian industry to help build structural hardware for the first Bharatiya Antariksh Station module, marking an early industrialization step for India's station program.⁷ - Indian government reporting said the first module, BAS-01, remains targeted for launch by 2028, with station operations targeted for 2035.⁸ - BAS-01 system engineering and subsystem technology-development work were reported to be progressing across ISRO centers and units; the overall configuration had been reviewed by a national-level review committee.⁸



Commercial Space Stations

Commercial space station activity in early 2026 centered on a smaller set of leading ISS-successor platforms: Axiom Station, Starlab, Vast’s Haven architecture, and Orbital Reef through tangential Sierra Space activity.

The period showed continued movement from concept development toward execution, with Axiom advancing both NASA mission activity and station hardware, Starlab pairing customer demand with a major NASA design milestone, and Vast combining hardware integration, private financing, and ISS mission selection. Capital formation also flowed to space station developers. Axiom, Vast, and Sierra Space each raised sizable funding rounds that strengthened their ability to create a future filled with commercial LEO infrastructure.

Key developments by station

Axiom Station	- On Jan. 30, NASA selected Axiom Space for the fifth private astronaut mission to the ISS, targeted no earlier than January 2027.⁹ - On Feb. 12, Axiom announced \$350M in financing to advance Axiom Station and its spacesuit-development work.¹⁰ - Axiom reported that construction work was underway and that, after NASA design reviews, Thales Alenia Space had begun welding and machining primary structures for the first Axiom Station module.¹¹
Starlab	- On Jan. 12, Starlab announced that Mitsubishi Corporation had reserved and pre-purchased capacity on Starlab, increased its investment, and joined Starlab’s board through a representative.¹² - On Feb. 23, Starlab said it completed its NASA-attended Commercial Critical Design Review, moving the program from design into fabrication, testing, and assembly.¹³ - Starlab announced partnerships or reservations with Auxilium Biotechnologies, Helogen, LambdaVision, and United Semiconductors for biofabrication, autonomous biomedical research, artificial-retina manufacturing, and semiconductor crystal-growth applications.^{14,15,16,17}
Haven-1 and Haven-2	- On Jan. 20, Vast announced that Haven-1 had advanced into the integration phase.¹⁸ - On Mar. 5, Vast announced \$500M in new financing to accelerate production of Haven space stations.¹⁹ - NASA selected Vast to conduct the sixth private astronaut mission to the ISS, targeted no earlier than summer 2027, and Vast confirmed that Haven Demo completed a controlled deorbit on Feb. 4, validating a path toward Haven-1.²⁰
Orbital Reef	On Mar. 5, Sierra Space announced a \$550M Series C round at an \$8B valuation, increasing total capital investments since 2021 to more than \$2B.²¹

A wide-angle, low-perspective shot from inside a futuristic space station module. The interior is clean, white, and modern, with a curved ceiling and walls. A large, octagonal window dominates the center of the frame, offering a panoramic view of Earth from space. The Earth's surface is covered in a dense layer of white clouds, with patches of blue oceans and brown landmasses visible. The lighting is bright and even, highlighting the sleek design of the station's interior. The floor is made of light-colored, rectangular tiles. On the left side, there's a curved doorway leading to another part of the station. The overall atmosphere is one of high-tech, clean, and expansive space exploration.

**Multiple station
developers raised
sizable rounds as
funding flowed
towards a future filled
with commercial LEO
infrastructure**



Capital Markets

2026

Capital Markets + Space

Capital markets activity in the space economy favored companies with clear ties to scaled infrastructure, national security demand, and defensible control points across the value chain.

Broader market data showed a strong funding backdrop, with Space Capital reporting \$36 billion invested across 148 space economy companies in Q1 2026 and Seraphim reporting a record \$8 billion in global SpaceTech investment during the quarter.^{1, 2} But capital formation was not distributed evenly across the sector; with capital activity increasingly concentrating around companies that own access (launch), control scarce assets (such as spectrum), are driving down manufacturing costs (satellites), or expand sovereign defense-aligned capacity.

Venture Capital

VC investments flowed to startups building the physical and technical infrastructure required to scale the next phase of the space economy. The largest rounds were concentrated in capital-intensive platforms such as reusable launch, spacecraft manufacturing, satellite communications, and defense-oriented space systems.

iSpace's roughly \$730M raise and Stoke Space's expanded \$860M Series D point to continued investor willingness to fund launch companies where reusability, cadence, and sovereign launch capacity could become structural advantages.^{4,5} Similarly, CesiumAstro's \$470M financing and True Anomaly's \$650M Series D reflect a broader move toward companies serving government, defense, and high-reliability communications needs rather than purely commercial growth stories.^{6,7} Taken together, the venture data suggests that investors are underwriting space companies less like software startups and more like strategic industrial platforms, where manufacturing scale, technical credibility, and government demand visibility are central to the investment case.

M&A

M&A activity pointed to a market where control of key constraints in the stack is becoming increasingly important. Strategic buyers focused on assets that reduce exposure to supply-chain bottlenecks, strengthen defense positioning, or bring scarce technical capabilities in-house. AE Industrial Partners' acquisition of a controlling stake in L3Harris' Space Propulsion and Power Systems business and Intuitive Machines' acquisition of Lanteris Space Systems both illustrate how propulsion, power, and spacecraft manufacturing are becoming strategic control points rather than outsourced inputs.^{8,9}

At the same time, Amazon's approximately \$11.57B agreement to acquire Globalstar highlights the importance of spectrum, satellites, and direct-to-device infrastructure as major technology platforms push deeper into space-enabled connectivity.¹⁰ The broader pattern suggests that space M&A is shifting from opportunistic consolidation toward purposeful vertical integration, with buyers seeking ownership of the enabling layers that determine resilience, speed, and margin capture.

Public Markets

Public markets remained selective, but investor appetite improved where companies could show revenue momentum, defense exposure, or credible paths to scale. York Space Systems' public listing, which raised \$629M at a roughly \$4.75B valuation, provided a benchmark for public-market interest in defense-oriented satellite manufacturing rather than space exposure in the abstract.¹¹

The strongest listed-space performers in the draft were also tied to clearer operating narratives: geospatial and data companies benefited from AI and government demand, satcom names benefited from direct-to-device and resilient connectivity themes, and defense-linked companies benefited from backlog visibility and missile-defense or classified-space exposure.¹² The more mixed performance of space-focused ETFs suggests public investors were not simply rotating into the space theme broadly; they were rewarding specific business models with visible demand, improving fundamentals, and relevance to government or defense priorities.¹²

2026

Venture Capital

Launch

- iSpace (Interstellar Glory) (China) closed a record Series D++ round of ¥5B (~\$730M), the largest single raise to date for a Chinese private space company, to accelerate its reusable rocket program and pre-IPO ramp. ¹
- Sierra Space (US) closed a \$550M Series C to support development of its Dream Chaser spaceplane and broader space operations. ²
- Stoke Space (US) raised \$350M in a Series D extension to advance development of its Nova reusable medium-lift launch vehicle, bringing full Series D funding to \$860M. ³
- PLD Space (Spain) secured a €180M (~\$209M) Series C to scale MIURA 5 and expand commercial launch access. ⁴
- Gilmour Space Technologies (Australia) secured A\$217M (~\$155M) in growth financing to scale Australian launch and satellite capability. ⁵
- Interstellar Technologies completed ¥20.1B (~\$130M) Series F led by Woven by Toyota, one of the largest fundraises by a private space startup in Japan, to scale manufacturing for its ZERO rocket ⁶

Satellites + Spacecraft

- CesiumAstro (US) closed a \$470M Series C package, including \$270M in equity and \$200M in additional financing, to expand software-defined communications platforms and manufacturing capacity. ⁷
- Chinese small-satellite and SAR EO Spacety raised ¥1.3B (~\$190M) to “advance IPO plans” ⁸
- Starcloud (US) raised \$170M Series A to scale development of space-based data-centers. ⁹
- Xona Space Systems (US) raised \$170M in a Series C to fund the Pulsar constellation and satellite production. ¹⁰
- Starfish Space (US) raised ~\$100M in Series B to scale satellite servicing. ¹¹
- Portal Space Systems (US) raised \$50M in a Series A to advance rapidly maneuverable spacecraft. ¹²
- Constellr (Germany) raised €37M (~\$43M) Series A to deliver defense-grade thermal intelligence and related civil-resilience applications. ¹³
- SatVu (UK) raised £30M (~\$40M) to fund its thermal-intelligence constellation and data infrastructure, with strategic and defense-linked investors including NATO Innovation Fund and Lockheed Martin. ¹⁴



2026

Venture Capital

Defense

- True Anomaly (US) raised \$650M in Series D equity plus \$50M in debt to accelerate space-superiority capabilities at scale. ¹⁵
- Turion Space (US) raised \$75M+ in a Series B to accelerate space-superiority fleet and software capabilities. ¹⁶
- HawkEye 360 (US) announced an additional Series E close of approximately \$23M to support RF intelligence capability. ¹⁷
- Citra Space (US) raised \$15M in a Series A to advance space-object-identification technology. ¹⁸
- Rhea Space Activity (US) raised approximately \$6M in a Series A to deploy GPS-resilient software for US and allied military / intelligence customers. ¹⁹

Other

- Vast (US) secured \$500M total, including \$300M in Series A equity and \$200M in debt, to accelerate Haven space-station production. ²⁰
- Northwood Space (US) raised \$100M Series B funds to scale production, harden its supply chain, and build out new global sites for its vertically integrated, phased-array ground stations. ²¹
- ATMOS Space Cargo (Germany) raised €25.7M (~\$30M) in a Series A to build the PHOENIX return-cargo fleet and ATMOS WORKS. ²²
- Antaris (US) raised \$28M in a Series A first close to accelerate AI-driven satellite mission design and operations. ²³
- Array Labs (US) raised \$20M in a Series A to scale radar manufacturing and prepare for launch. ²⁴
- Mantis Space (US) raised \$10M+ in a seed round to fund orbital-energy infrastructure ²⁵
- Arinna (US) raised \$4M in a seed round to develop ultrathin spacecraft solar panels and other space-power components. ²⁶

2026

Exits: M&A

Date	Buyer → Target	Financial Details	Notes
Jan 5 Announced ¹	AE Industrial Partners → L3Harris Space Propulsion and Power Systems controlling stake	\$845M total enterprise value; RS-25 excluded	Financial sponsors moved into space industrial-base carveouts where propulsion and power are scaling constraints
Jan 13 Closed ²	Intuitive Machines → Lanteris Space Systems (US)	\$800M; \$450M cash plus \$350M LUNR stock	Enhances Upstream spacecraft manufacturing and defense-network capability. Vertically integrated Space Prime posture by buying more of the stack.
Jan 15 Closed ³	Parsons → Altamira Technologies	Up to \$375M	Defense buyers are pulling space data into workflow and integration layers, not only payloads
March 13 Closed ⁴	SpaceX → Hexagon Purus US aerospace business	\$12.5M cash plus \$2.5M earn-out	Small supplier-chain verticalization can still matter when launch and spacecraft production scale require tighter component control.
March 9 Closed ⁵	CACI → ARKA Group	~\$2.6B all-cash transaction	EO-to-EI consolidation is occurring through sensor data and workflow software, especially in defense intelligence
March 11 Announced ⁶	Anduril → ExoAnalytic Solutions	Undisclosed	Defense-tech buyers are acquiring sensing layers that support SDA and missile-defense workflows.
April 14 Announced ⁷	Amazon → Globalstar	Approx. \$11.57B; cash / stock election	Acquires MSS spectrum, satellites, operating infrastructure, and D2D / device-distribution path aligned with Amazon Leo plans
April 14 Closed ⁸	→ Mynaric AG	Approx. \$155.3M; cash plus RKL shares	brought a constellation transport bottleneck in-house as optical links became a strategic layer
April 30 Announced ⁹	York Space Systems → ALL.SPACE	Undisclosed	Satellite primes are internalizing communications hardware and ground connectivity to own more of the service path

2026

Exits: IPO / SPAC

Space Company IPOs / SPACs Q1 2026

Listing Date	Company	Category	Exchange: Ticker	IPO Raised @ Day 1 Valuation
JAN 29	York Space Systems [US]	Satellite Manufacturing	NYSE: YSS	\$629M @ \$4.75B ¹

Space Company IPOs/ SPAC Pipeline

Company	Category	Pipeline Details
iRocket (US)	Launch	Entered into SPAC agreement with BPGC Acquisition Corp June 2025. ² Merger pending
Yixin Aerospace (China)	Satellite Components	Filed IPO listing guidance in August 2025 ³
Landspace (China)	Launch	Completes 'tutoring' process ahead of STAR Market IPO December 2025 ⁴
Spacety (China)	Satellite Manufacturing	Disclosed IPO plans in filing with China Securities Regulatory Commission (CSRC) in February. ⁵
GalaxySpace (China)	Launch	Filed for A-share IPO counseling (pre-listing guidance) with the Beijing Regulatory Bureau of the China Securities Regulatory Commission (CSRC) in March. ⁶
CAS Space (China)	Launch	Filed for IPO on STAR Market in April. Seeking to raise ¥4.18B (\$607M) ⁷
SpaceX (US)	Launch, SatCom, Etc	Confidentially filed for IPO in April. ⁸
Hawkeye 360 (US)	EO Satellites (RF) / Analytics	filed a registration statement on Form S-1 with the SEC in April ⁹
MinoSpace (China)	Satellite Manufacturing	Completed IPO guidance and inspection process April 29. ¹⁰

2026

Public Company Performance

Space Economy Stocks: Top 10 Q1 2026 (% Increase)

Company Name	Q1	Drivers
Satelllogic	178%	80% YoY revenue growth, sharply improving operating/EBITDA losses, and “turning point” narrative around positive operating cash flow and growing defense/AI constellation opportunities
Spire	61%	Double-digit ex-maritime revenue growth, continued expansion of government data contracts (radio occultation/ocean winds with NOAA and others)
Iridium	56%	Investor positioning for direct-to-device / sat-IoT upside and defensive cash-flow stability
Planet Labs	37%	Record Q1 FY26 revenue of \$66.3M and sustained growth trajectory signaled in prior quarters. Growing investor narrative around as beneficiary of AI-driven geospatial demand
MDA Space	26%	32% YoY revenue growth to \$464M with improving margins and \$90.6M adjusted EBITDA, plus a multiyear \$3.7B-class backlog that underlined visibility in satellite systems, robotics, and GEOint
Viasat	22%	De-risking Ka-band fleet, improving leverage profile, and broader rotation into profitable satcom incumbents
Blacksky	21%	Sizeable new contracts (up to \$160M) and growing Gen-3 / AI constellation revenue visibility
Firefly	20%	Record Q1 FY26 \$80.9M revenue (up ~40% QoQ), strong 2026 guidance of \$420–450M, and visible USSF and missile-defense wins (Golden Dome, FORGE ECP) that validated position as an emerging prime in launch and space transport
Northrop Grumman	16%	Investor rotation into Tier-1 defense primes levered to missile defense and classified space
L3Harris	13%	15% organic revenue growth (>\$600M YoY), improving segment margins, and a surging \$7.8B order intake and >40B backlog, reinforcing a thesis of multi-year growth across comms, ISR, and space systems tied to higher US and allied defense outlays

Space Economy ETFs

Company Name	Q1	Drivers
ROKT	12%	SPDR S&P Kensho Final Frontiers ETF
UFO	11%	Procure Space ETF
BATS:ARKX	-2%	ARK Space & Defense Innovation ETF





**A look
forward**



A Look Forward

The Hidden Economics of AI in Space

Artificial intelligence is quickly becoming a core part of how space companies operate.

AI runs satellites, helps analyze Earth data in real time, and supports decisions on the ground and in orbit. AI is no longer a future idea. It is already part of daily operations.

But something unexpected is happening. As companies use more AI, costs are rising faster than planned. Even more challenging, many leaders cannot clearly explain what they are getting back for that spend. What started as an innovation story is now becoming a financial one.

At the center of the issue is how AI is priced.

Most AI systems charge based on tokens, which reflect how much computing power is used. Tokens show activity, not results. Two companies can spend the same amount on AI and see very different outcomes. One may improve operations and reduce costs. The other may create little real value.

This matters even more in the space industry.

Space companies already deal with high costs, long timelines, and tight margins. AI is added to help improve autonomy, detect problems faster, optimize ground systems, and turn data into revenue. But without clear measurement, AI can quietly become another growing expense instead of a tool that lowers the cost of missions.

There are clear reasons why this happens. Failed AI tasks still consume computing power. Systems often process more data than they need. Simple tasks are sometimes sent to expensive models when cheaper ones would work. These are not rare mistakes. They are design choices that add up quickly, especially in data heavy space operations.

The solution is not just better technology. It is better discipline.

Space companies need to measure AI by outcomes, not usage. Leaders should ask questions like cost per fixed anomaly, cost per useful insight, and cost per deployed capability. Without these links, AI spending is hard to manage and even harder to defend to boards, investors, and regulators.

Over time, AI will make the economics of space more visible. As companies measure the cost of each unit of work, real differences in efficiency will become clear. In a future shaped by data and autonomy, this transparency will matter as much as rockets and orbits.

The question is no longer whether space companies will use AI. That is already happening. The real question is whether they will build the financial foundation to understand what AI actually delivers.

If AI is the new operating layer of the space economy, its value will not be defined by how much it is used, but by how clearly its cost connects to real results.

Let's Talk

Now is the moment to engage. Leaders should bring finance, operations, and technology together to ask better questions about how AI is designed, measured, and governed. Start small, focus on real mission outcomes, and make costs visible at the unit of work level.

Those who act early will unlock new forms of value, not by using more AI, but by using it with intent. The next quarter is an opportunity to move from experimentation to clarity, from spending to learning, and from tools to true advantage.

Reach out to us let's talk.



Ready to explore the space economy?

Contact KPMG today to discover how your organization can thrive in the Space Economy.



+SPACE IGNITION WORKSHOPS



Explore the growing space economy!

This immersive, design-thinking-fueled workshop takes you into the heart of the space revolution, examining the wealth of opportunities orbiting our planet. Through highly engaging, interactive exercises, you'll uncover the near-term realities and future potential of space-based ventures.

Collaborate with your team and subject matter professionals to identify strategies that can benefit your organization and team, ensuring you are well positioned in the expanding space market now, near, and next.

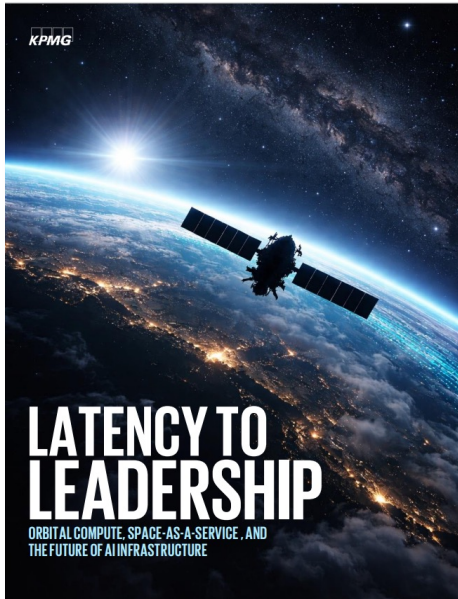


Take a deep dive into the specifics of the space economy and discover how your organization can benefit today.

This focused workshop offers practical insights into the applications of space technology with tailored use cases for your team. Collaborate with other participants to identify potential partnerships within the space sector, fostering ventures that amplify your impact. You will leave with clear strategies for leveraging immediate opportunities and aligning with space-based assets and technologies for future growth.

KPMG Ignition is ready to transform your organization's capabilities and contribute to the future of space exploration and commerce.

Read on to learn more



Latency To Leadership examines how AI-driven demand and orbital compute are transforming space into the next critical layer of digital infrastructure. It challenges leaders to rethink where intelligence operates—and to act now to convert latency, resilience, and sovereignty into strategic advantage.



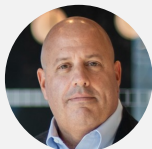
The **KPMG +Space: Infinite Horizons** eBook focuses on the connection between different industries and space and how leaders can drive innovation and unlock new value.



The **+Space Tech** eBook reframes the space economy as a connected technology stack—from orbital infrastructure to real-world applications—showing how space quietly powers modern enterprise. It equips leaders with a clear blueprint to move from curiosity to action, turning space-enabled data, connectivity, and intelligence into scalable competitive advantage.



The **Beyond the Grid** article explores why the next economic expansion of energy starts above it, as the global energy sector is undergoing a complex transition driven by decarbonization, grid modernization, and surging global demand. Simultaneously, the commercial space economy is rapidly deploying an “invisible layer” of infrastructure in orbit that offers unprecedented capabilities in Earth observation, ubiquitous connectivity, and advanced data analytics.



Brian Miskze
Principal, National
US Ignition Leader



David Pessah
Executive Director
Ignition



Jozy Assa-Jacobson
Director
Ignition

A close-up of an astronaut's helmet, reflecting a vibrant, colorful galaxy with swirling blues, purples, and oranges. The helmet is white with various attachments and a clear visor.

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A close-up of an astronaut's helmet, reflecting a vibrant, colorful galaxy with swirling blues, purples, and oranges. The helmet is white with various attachments and a clear visor.

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A close-up of an astronaut's helmet, with the visor reflecting a vibrant, colorful galaxy. The helmet is white with various attachments and a red light on the side. The background is a dark, starry space.

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