THE ARCTIC EMERGING AS THE NEW GEOPOLITICAL HOTBED AMID THE GROWING ROLE OF DATA SERVICES IN HOMELAND SECURITY. KEEP AN EYE ON SPIR.

Why Is the Arctic Region in the Limelight Suddenly?

The U.S. Department of Defense (DoD) on July 22, 2024, unveiled a comprehensive **Arctic Strategy** aimed at preserving the region as a stable environment where the U.S. homeland remains secure and vital national interests are safeguarded. The strategy's primary objective is to monitor and respond to threats from and through the Arctic, while also enhancing domain awareness and communications capabilities. It emphasizes the importance of building and sustaining a **"monitor-and-respond" approach** that is underpinned by robust intelligence collection capabilities, security cooperation with regional Allies and partners, and the deterrent value of DoD's ability to deploy the Joint Force globally. According to the report, this approach will enable DoD to achieve its desired **"end state"** for the region, aligning with efforts to strengthen homeland defense, safeguard U.S. interests, and improve interoperability with Arctic allies and partners. While the plan might seem to have little relevance to SpaceTech, it depends largely on **comprehending satellite data**, which means that companies involved in satellites, data management, and AI will have opportunities as a result of this initiative.

The Arctic Region is a Geopolitical Hotbed

Source: Intro-act, U.S. DoD 2024 Arctic Strategy Document

Why is the Arctic Region so Important to the U.S.?

First, the Arctic serves as **an avenue for power projection** to Europe, which is vital to the defense of the Atlantic Sea lines of communication between North America and Europe. The region includes multiple strategically significant maritime chokepoints, such as the Bering Strait between Alaska and Russia, and the Barents Sea north of Norway, which are becoming more navigable due to climate change. Second, the Arctic is **critical for homeland defense**, as it hosts aerospace warning, aerospace control, and maritime warning capabilities for the binational U.S.-Canada North American Aerospace Defense Command (NORAD). The region also plays a significant role in Indo-Pacific operations, serving as the northern flank for projecting military force from the U.S. homeland to that region. Third, the Arctic is important for **economic interests**, as it contains vast natural resources, including oil, gas, and minerals. According to the strategy document, the region has the potential to become a significant source of energy, with Russia already investing heavily in new military infrastructure and refurbishing Soviet-era installations. Fourth, the Arctic is crucial for **environmental concerns**, as climate change is increasing the unpredictability of an already challenging environment. According to the document, the region's harsh conditions make it essential for the U.S. to maintain a strong presence and invest in advanced sensors and data to aid forecasts and longer-term climate projections. Finally, the Arctic serves as a **critical testing ground for special operations forces (SOF)**, which provide unique expertise, capabilities, and access that strengthen the U.S. ability to campaign in the region. SOF collaboration with Arctic Allies provides the U.S. with a distinct advantage focused on domain awareness, early warning, and forward posture.

The Strategic Environment in the Arctic Region

Source: Intro-act, U.S. DoD 2024 Arctic Strategy Document

The PRC-Russia Nexus and the Growing Geopolitical Powerplay

The PRC and Russia have been increasingly operating in the Arctic region, with a focus on expanding their influence, accessing natural resources, and enhancing their military capabilities. According to the strategy document, the **PRC**

has been actively seeking to increase its presence in the Arctic, despite not being an Arctic nation. The country has been leveraging changing dynamics in the region to pursue greater influence and access, take advantage of Arctic resources, and play a larger role in regional governance. To achieve this goal, the PRC operates **three icebreakers in the region, enabling its dual civil-military research efforts**. These vessels have tested uncrewed underwater vehicles and polar-capable fixed-wing aircraft, among other activities.

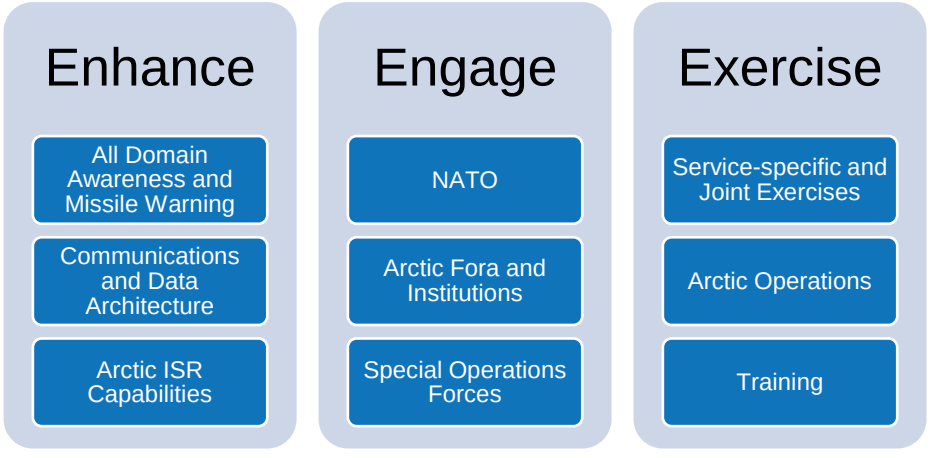
The PRC has also been promoting the concept of the **"Arctic region as a global common"** to shift Arctic governance in its favor. This approach is reflected in its 2018 Arctic Policy, which claims that non-Arctic states should contribute to the region's *"shared future for mankind,"* due to the Arctic's global significance. The PRC has also been investing in infrastructure and natural resources, including in the territory of NATO Allies. Russia, on the other hand, plays a significant role in its own security and economic calculations, with the Arctic being Russia's second priority region after its *"near abroad."* **Russia boasts the largest Arctic territory and the most developed regional military presence of all the Arctic nations** and continues to invest heavily in new military infrastructure and refurbishing Soviet-era installations in the region.

So, What's the Plan?

The U.S. Arctic Strategy outlines several initiatives for advanced technology development in the Arctic region. Among these are **enhancing the Joint Force's technology arsenal and infrastructure in the Arctic**, a key pillar in DoD's approach for operating in that complex, rapidly changing area. To improve its ability to monitor events in the Arctic and execute a tailored response to national security threats, the strategy directs a range of activities across three broad lines of effort. The first line encompasses a variety of technologies that the U.S. military says it must prioritize to innovate and expand its Arctic presence. These include **early warning capabilities**; **discrimination sensors; tracking sensors; Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) capabilities; improved understanding of the electromagnetic spectrum; and sensing and forecasting capabilities**.

The strategy also calls on the Pentagon to evaluate options for improving ground-based sensors to complement and enhance existing NORAD capabilities. Additionally, officials are directed to **continue research into options for new space-based missile-warning and observational systems with greater polar coverage**. Beyond maintaining investments in crewed and uncrewed aerial systems to enable air and maritime ISR capabilities, the strategy also urges the DoD to conduct an analysis of requirements for future uncrewed platforms that can operate in the Arctic.

DoD's Monitor-and-Respond Approach Underlying the Arctic Strategy



Source: Intro-act, U.S. DoD 2024 Arctic Strategy Document

Furthermore, the strategy emphasizes the importance of investing in **satellite solutions** to improve tactical and strategic communications. Officials are further directed to engage with allies and partners to improve data coverage and capacity for the more than 250 anticipated, advanced multi-role combat aircraft that NATO could deploy for Arctic operations by the 2030s. Deputy Defense Secretary Kathleen Hicks notes that AI is helping the military to make sense of an environment, pattern recognition, bringing in data, and understanding the environment to make better decisions and faster decisions. She adds that this is a space where bringing the two together or generally being able to leverage AI can be advantageous.

The Role of Data

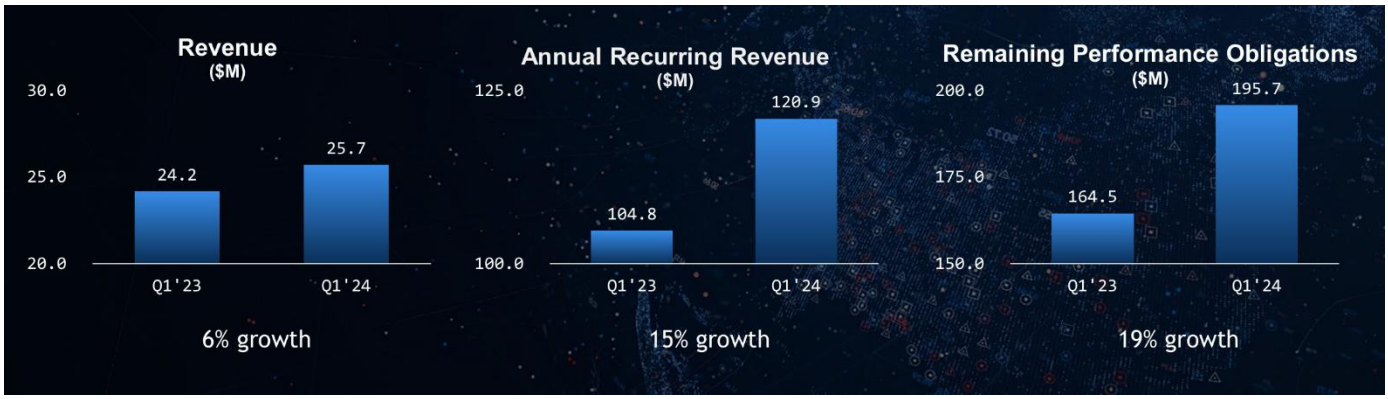
The ambitious strategy outlined above rests on the ability of the U.S. military to make sense of the data that its sensors and other equipment gather for the Arctic region. For this to happen, it would need to collaborate with players that are adept in analyzing the satellite/sensor data, thus providing a major opportunity for the data services players. We believe that as the U.S. military navigates the evolving geopolitical scenario, there will be a growing need for companies that can help it gain insights out of the enormous amount of data that it collects. Data services companies that have expertise in analyzing such datasets will emerge as the winners, and investors should keep an eye on players like **Spire Global, Inc. [NYSE: SPIR]** and **Planet Labs PBC [NYSE: PL].** We spotlight SPIR below.

Company Spotlight: Spire Global, Inc. [NYSE: SPIR]

SPIR is a **leading provider of subscription-based data, insights, predictive analytics, and project-based services** worldwide. The company offers a range of solutions that cater to various industries, including maritime, weather, aviation, and space services. Its flagship product is a satellite-based aircraft tracking system that provides real-time updates on vessel movements, enabling more accurate route optimization and improved safety. In addition to its aircraft tracking solution, SPIR also offers data-driven insights for the maritime industry, providing ship owners and operators with valuable information on weather patterns, sea conditions, and other factors that affect their operations. The company's predictive analytics capabilities enable customers to make informed decisions about vessel routing, reducing costs and improving safety. SPIR's space-based data and analytics solutions are designed to empower organizations to navigate the challenges of climate change and global security threats. At the heart of this endeavor lies **SPIR's impressive constellation of satellites**, which boasts the largest multi-purpose array in the industry. This remarkable feat enables the company to provide unparalleled insights into weather patterns and climate trends.

One of the key innovations that sets SPIR apart is its proprietary **High-Resolution Weather Forecast model**. Powered by data collected from orbit, this cutting-edge tool offers a six-day outlook that is unmatched in terms of accuracy and precision. What's equally impressive is SPIR's ability to process vast amounts of data on a daily basis - over 10 terabytes of information every day - enabling it to harness the data to train impressive AI/ML models for various industries and applications. A key differentiator for SPIR is its ability to collect and provide high-quality, proprietary data that can only be collected from space, as noted above. This unique dataset enables the company to train AI/ML models that are more accurate and effective than those trained on publicly available data. In recent years, there has been an increasing demand for high-quality data and analytics solutions that can provide insights at unprecedented speeds. This trend is driven by emerging trends such as climate change and global security challenges, which are becoming more frequent and costly. SPIR's innovative **"space-as-a-service"** business model enables customers to operate their own payloads in orbit through the company's API, providing a flexible and cost-effective solution for organizations requiring access to high-quality data and analytics.

SPIR Posted a Strong 1Q24, With Sustainable Growth Driven by Diverse Solutions



Source: Intro-act, SPIR 1Q24 Earnings Presentation

SPIR's strong operational leverage is enabling it to make progress toward achieving profitability, and its 2Q24 results are expected to be a significant milestone in this journey. Its 2Q24 mid-point adjusted EBITDA is anticipated to be positive, reaching $3.5 million. Moreover, the company expects to generate positive operating cash flow, further solidifying its financial position. It expects its 2024 sales to reach $127.0 million at mid-point, +20% over FY23, while non-GAAP operating loss is expected to be reduced by $19.8 million compared to FY23.

In addition to its financial progress, SPIR is also making significant strides in its debt refinancing efforts. The company successfully raised $40 million in gross proceeds at an average price of $13.44 per share in 1Q24, reducing its debt and providing additional cash on its balance sheet. The environment surrounding SPIR's solutions remains highly supportive, driven by growing concerns about climate change. **We believe SPIR is well poised to benefit from the ever-increasing need of data analytics services for military applications. This, combined with its impressive financial performance, makes SPIR an attractive choice for space investors to watch out for.**

SPIR Yielded Over 41% Returns Over Last Month

Source: Intro-act, SPIR 1Q24 Earnings Presentation

INDUSTRY TRENDS

Starliner to remain on ISS for more thruster tests. NASA and Boeing plan to keep the CST-100 Starliner spacecraft at the International Space Station until July to conduct additional tests on its thrusters and helium leaks. The agency will perform tests on the ground, including simulating the spacecraft's approach to the ISS, to better understand the issues that caused it to malfunction. Once the tests are complete, NASA will set a return date for Starliner, which could be as late as July. The extended mission duration and thruster problems may delay certification of the vehicle for crew rotation missions, but NASA is working on preparations for both Starliner-1 and Crew-10 in parallel. Read more. *(SpaceNews)*

NASA and SpaceX studying ways to mitigate Dragon trunk debris. NASA and SpaceX are studying ways to modify the Dragon spacecraft's reentry process to minimize trunk section debris that reaches the ground. Debris from previous missions has been found in Australia, Saskatchewan, and North Carolina, prompting concerns about safety and environmental impact. NASA and SpaceX acknowledge that improvements are needed, with initial studies suggesting the trunk should burn up fully upon reentry. The agency is exploring alternative deorbiting procedures, including doing the deorbit burn before releasing the trunk to control its reentry and ensure debris lands in unpopulated regions. Read more. *(SpaceNews)*

Rosotics unveils 3D printer with space applications. Rosotics unveiled Halo, a metal 3D printer designed for rocket tanks and large aerospace structures, with applications in space, naval, and energy industries. The company's first customer is Phantom Space, which manufactures satellites and launch vehicles. The Halo platform consumes less power than other forms of metal production, making it suitable for space-based applications. With a retail price of $950,000, Rosotics plans to deliver the machines to customers in the US and Europe by late August, aiming to begin production with the new technology. Read more. *(SpaceNews)*

Rosotics' Halo is the Company's Latest Induction-Based Metal Additive Manufacturing Platform

Source: Intro-act, Space News, Rosotics

U.S. Space Force chief emphasizes international partnerships. Gen. Chance Saltzman, chief of space operations for the US Space Force, emphasized the importance of international partnerships in safeguarding space assets and operations during a keynote address at the 2024 Global Air and Space Chiefs Conference in London. He highlighted the appointment of UK Air Marshal Paul Godfrey as his assistant chief for future concepts and partnerships, marking the first time a non-US officer has held such a senior position within the Space Force. Saltzman framed this approach as "integrated by design," acknowledging the Space Force's reliance on partnerships with commercial industry, academia, and nonprofits, as well as military alliances. He also mentioned US partnerships with India, Japan, Norway,

and others in space activities, including data sharing, joint missions, and information sharing to strengthen deterrence against hostile actions in space. Read more. *(SpaceNews)*

D-Orbit forms U.S. venture to pursue satellite manufacturing. D-Orbit, a European space transportation company, has established D-Orbit USA, a joint venture with five American co-founders who have worked on satellite programs such as OneWeb and Starlink. The venture combines D-Orbit's experience with its ION line of orbital transfer vehicles with the expertise of the US-based team to deliver innovative, reliable, and cost-effective solutions. D-Orbit USA plans to develop the ION satellite bus, which can accommodate payloads up to 200kg, featuring both chemical and electric propulsion options, and is designed to operate for five years. The venture aims to compete on cost and speed, with a modular design that can scale up production smoothly. Read more. *(SpaceNews)*

Saudi Arabia and the US Forge stronger ties in space exploration. Saudi Arabia and the United States have signed a framework agreement to boost cooperation in civilian space exploration and research, marking a significant step in their collaboration in space technology. The agreement was signed by NASA Administrator Bill Nelson and Saudi Space Agency CEO Mohammed bin Saud Al-Tamimi, creating a legal framework for strengthened cooperation. The accord acknowledges the importance of the Artemis Accords, which reflect both countries' commitment to transparent, safe, and responsible exploration of space. Read more. *(Space Impulse)*

SpaceX makes Starlink Roam available throughout the US. SpaceX has made its Starlink Roam service available nationwide in the US, offering high-speed Internet access without requiring a residential subscription. The kit includes a waterproof dish, Wi-Fi router, and DC power source, with maximum download speeds exceeding 100 Mbps. The service is available coast-to-coast for an initial investment of $599, followed by a fixed monthly payment. Additionally, SpaceX offers a Mobile Regional option for adventure seekers, providing unlimited inland mobile data for $150 per month or a 50GB cap for $50 per month. Read more. *(Space.com)*

A Starlink Receiver

Source: Intro-act, Space.com, SpaceX

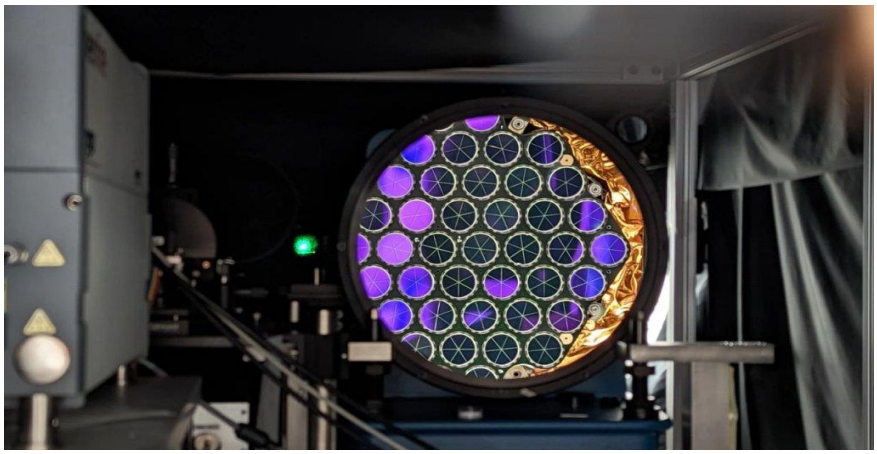
Cygnus cargo spacecraft departs the ISS for a fiery re-entry in Earth's atmosphere. Northrop Grumman's Cygnus spacecraft, named S.S. Patricia "Patty" Hilliard Robertson, undocked from the International Space Station (ISS) on July 12 after a 5.5-month stay, carrying over 8,200 pounds of supplies and scientific hardware. Launched on January 30, Cygnus arrived at the ISS two days later and will now re-enter Earth's atmosphere, carrying some science gear but not reaching the ground intact. This marks the end of the NG-20 mission, with Cygnus being one of three robotic freighters servicing the ISS, along with SpaceX's Dragon capsule and Russia's Progress spacecraft. Read more. *(Space.com)*

Drone racing is helping train AI to autonomously drive spacecraft. The European Space Agency's Advanced Concepts Team has partnered with the Delft University of Technology to train neural-network artificial intelligence systems to race drones, aiming to test AI's ability to handle complex maneuvers for future space missions. The program uses neural networks that mimic human brains to pass along information and could enable autonomous spacecraft operations by considering real-time data and making course corrections. Read more. *(Space.com)*

NASA cancels $450 million VIPER Moon rover due to budget concerns. NASA has canceled the VIPER Moon rover program due to rising costs, with a total investment of $450 million so far. The mission was intended to scout for lunar ice deposits near the South Pole and was scheduled to launch in 2025. Despite being successful thus far, the cancellation is expected to save NASA an additional $84 million in development costs. The agency will now look to reuse VIPER's scientific instruments and components for future Moon missions or potentially sell them to industry. Read more. *(Space.com)*

Space Force launching lasers in 2025 to help pinpoint the center of Earth. The US Space Force plans to launch two GPS III satellites, SV9 and SV10, in 2025 equipped with laser retroreflector arrays (LRAs) to improve Earth's center location pinpointing. The LRAs will use Satellite Laser Ranging technology to make precise measurements, allowing researchers to accurately determine the center of mass of Earth. This mission is a partnership between the Space Force, National Geospatial-Intelligence Agency, and NASA, with the goal of providing more accurate positioning information for tracking changes in the Earth's surface following events like tsunamis and earthquakes. Read more. *(Space.com)*

Space Force Launching Lasers in 2025 to Help Pinpoint the Center of Earth



Source: Intro-act, Satellite News Network, Space.com

Russia to build own space station by 2033: Plan unveiled. Russia's state space agency Roscosmos plans to build its own independent space station, the Russian Orbital Station (ROSS), by 2033. The project involves launching modules from 2027 to 2033, with a total cost of approximately $6.98 billion. The station will orbit at an altitude of around 250 miles above Earth and is expected to be used for research, scientific development, and security purposes. Roscosmos has signed contracts for the space segment, next-generation manned spacecraft, and Angara heavy carrier rocket, which will service the station. Read more. *(Orbital Today)*

Is your Internet safe? NATO's $2.5M satellite project takes on undersea cable threats. NATO is investing $2.5 million in a project called Project HEIST to protect the Internet from potential sabotage by rerouting traffic through satellites in case undersea cables are compromised. The initiative, which brings together researchers and private sector partners, aims to develop a seamless method of redirecting Internet traffic from subsea cables to satellite systems in times of crisis. The project includes improving threat detection to meter-level precision, testing prototypes, and navigating international regulations. Read more. *(Orbital Today)*

SPACETECH NEWS

GOVERNMENT POLICIES

House spending bill directs NASA to study asteroid and orbital debris missions. The House spending bill directs NASA to study asteroid and orbital debris missions. The report includes provisions calling on NASA to spend $5 million on a public-private partnership reconnaissance mission to Apophis, a near-Earth asteroid, prior to its 2029 flyby. Additionally, the report allocates up to $25 million for an Orbital Debris Inspection Mission in NASA's Small Satellite Technology program. The bill also expresses support for NASA's Mars Sample Return and Chandra X-ray Observatory programs, while seeking changes to NASA's approach for its Commercial Low Earth Orbit Development program. Read more. *(SpaceNews)*

House spending bill cuts NASA science and education programs. The House spending bill for fiscal year 2025 cuts funding from NASA's science and education programs, providing nearly $25.18 billion for the agency, a 1.2% increase over 2024 but $205 million less than the White House request. The bill keeps science funding at 2024 levels, cutting $231.5 million from NASA's request, while education programs, STEM Engagement, receive $89 million, a sharp cut from the requested $143.5 million. The bill eliminates funding for the Minority University Research and Education Project but increases funding for space operations by $83.8 million. Read more. *(SpaceNews)*

House introduces NASA reauthorization act. The House Science Committee has introduced the NASA Reauthorization Act of 2024, which formally authorizes $25.225 billion in funding for NASA in fiscal year 2025 and addresses various programs and policies. The bill prioritizes human space exploration missions to the Moon, Mars, and beyond, while also supporting near-term priorities like the International Space Station and scientific research. It includes provisions requesting reports from NASA or other agencies on topics such as Space Launch System usage, Hubble Space Telescope servicing, and commercial procurement of space weather data. Read more. *(SpaceNews)*

CAPITAL MARKETS

Pentagon greenlights $140 billion ICBM program despite cost overruns. The US Department of Defense has approved the $140 billion Sentinel intercontinental ballistic missile program despite significant cost overruns and schedule setbacks. The program aims to replace aging Minuteman III ICBMs with a new system, led by Northrop Grumman, but has faced criticism due to escalating costs from $118 million per unit to $162 million, a 37 percent increase. Total program costs have jumped from $96 billion to $140.9 billion over the next decade, with delays expected until the early 2030s. Read more. *(SpaceNews)*

Chinese satellite manufacturer MinoSpace raises $137 million. Chinese commercial satellite maker MinoSpace secured over $137 million in funding from Wuxi Economic Development Zone Shangxian Industry Investment Fund, Liangxi Science and Technology Innovation Industry Fund, and existing shareholder Qingdao Huizhu Anfulan. The funds will be used to implement major national and commercial missions, enhance the supply chain, and increase investment in core products and technologies. Read more. *(SpaceNews)*

Sift raises $17.5M in Series A round. Sift, a Southern California startup founded by former SpaceX software engineers in 2022, raised $17.5 million in Series A funding led by Google Ventures to accelerate development and expand its platform for reviewing hardware sensor data. The platform automates analysis of streamed data, generating reports highlighting potential issues, and is used by customers in aviation, defense, energy, and transportation industries. With the investment, Sift will expand its staff and develop its manufacturing automation suite, as well as integrate artificial intelligence to enable engineers to query systems and automate regulatory compliance legwork. Read more. *(SpaceNews)*

Microsoft leads $40 million funding for Starlink networking startup. Microsoft-led M12 has invested $40 million in Starlink networking startup Armada to develop mobile data centers tailored for SpaceX's Starlink broadband network. The investment will enable Armada to deploy artificial intelligence computing tools, manage Starlink terminals

and connected assets, and offer ruggedized data centers called Galleons for edge computing. Galleons will integrate with satellites in Low Earth Orbit, enabling off-grid customers to process data in real-time using generative AI services. Read more. *(SpaceNews)*

X-Bow raises $70 million to boost solid rocket motor production. X-Bow Systems, a space technology startup, has secured $70 million in Series B funding to expand production capabilities and complete a new manufacturing facility in Texas. The investment round was led by Razor's Edge, with participation from Lockheed Martin Ventures, Boeing Ventures, Crosslink Capital, and Balerion Space Ventures. The fresh capital will support increased production of solid rocket motors and the completion of the factory, which is expected to address critical industrial base and defense needs. X-Bow uses 3D printing technology to produce motors and propellants, reducing production time and costs compared to traditional methods. Read more. *(SpaceNews)*

Test of an X-Bow Systems Additively Manufactured Solid Propellant

Source: Intro-act, Space News, X-Bow Systems

AEI hunting for more space investments after closing a $1.28 billion fund. AE Industrial Partners (AEI) has closed its third flagship fund with $1.28 billion, exceeding the target and hitting a hard cap. The private equity firm is now seeking more space investments, citing huge growth potential in the sector. AEI has already deployed over a quarter of the fund into companies such as York Space Systems, Firefly Aerospace, RedWire, and Sierra Space, among others. The firm sees soaring demand for new space technologies to meet national security needs and notes that the U.S. government is becoming more open to collaborating with non-traditional primes. Read more. *(SpaceNews)*

LiveEO secures €25M in Series B funding to support climate risk management with satellite data. LiveEO, a Berlin-based company, has secured €25 million in Series B funding to expand its capabilities in turning satellite data into practical insights for climate risk management. The platform has helped clients like Deutsche Bahn and Network Rail manage assets and reduce carbon footprint. The funding will support scaling operations, expanding the team to 130 employees, and delivering essential insights across industries, with a projected market reach of $14.6 billion by 2034. Read more. *(Space Impulse)*

ISPTech Secures €2M in pre-seed funding to advance green propulsion for satellites. ISPTech, a spin-off from Germany's DLR, has secured €2 million in pre-seed funding to advance its green propulsion technology for spacecraft. The investment will help develop and qualify the company's propulsion systems for spaceflight, aiming to launch the first systems by 2025. ISPTech's technology utilizes non-toxic propellants, addressing a significant need in the satellite industry, and offers better performance and safety compared to existing alternatives. Read more. *(Space Impulse)*

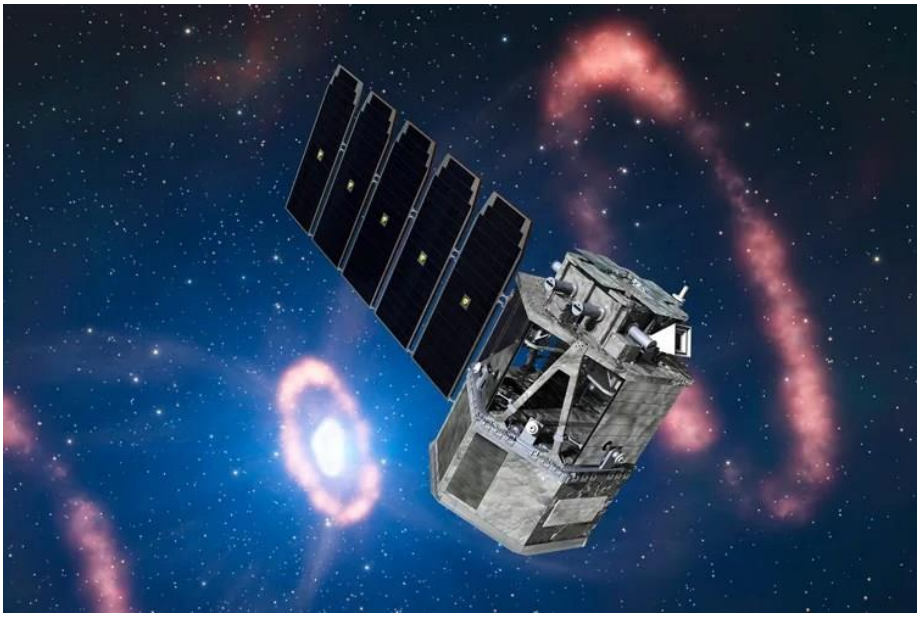
NorthStar secures funding to advance space situational awareness technology. NorthStar Earth & Space has secured new shareholder financing led by Telesystem Space, accelerating its development of patented space-based Space Situational Awareness (SSA) technology. This technology supports critical space security efforts with the US Government and allies, detecting potentially hostile activities against defense and intelligence assets in space. NorthStar stands out as the only company with a US patent for its Concept of Operations, which locates, identifies, and tracks potential space threats. Read more. *(Space Impulse)*

Italian Startup FAST Secures €500K for Air-Launched HyperDart Rocket. Italian startup FAST Aerospace secured a €500,000 "Proof of Concept investment" from Galaxia to develop a prototype of the ramjet engine that will power its carrier aircraft for the air-launched HyperDart rocket system. The system is designed to deliver 250-kilogram payloads to Low Earth Orbit and includes a remotely piloted aircraft carrying an expendable rocket to an altitude of 25 kilometers, where the methalox engines fire, propelling the payload into space. The funding will be used to design and build a scaled-down version of the full-size engine, with plans to ignite the prototype by the end of 2025 and attempt an initial test of HyperDart in 2029. Read more. *(European Spaceflight)*

GOVERNMENT CONTRACTS AND PARTNERSHIPS

SpaceX wins NASA contract to launch gamma-ray astronomy mission. NASA has selected SpaceX to launch the Compton Spectrometer and Imager (COSI) spacecraft on a Falcon 9 in August 2027 for $69 million. COSI is a small Explorer-class mission that will detect soft gamma rays from sources in the galaxy and beyond. The mission was originally projected to launch in 2025 but was delayed due to budget constraints, increasing its overall cost. NASA also faces delays with another Explorer-class astrophysics mission, UVEX, which has been pushed back to 2030. Read more. *(SpaceNews)*

COSI Gamma Ray Telescope



Source: Intro-act, NASA

Blue Origin, Stoke Space selected by U.S. Space Force to compete for small satellite missions. The U.S. Space Force has added Blue Origin and Stoke Space Technologies to its list of launch providers eligible for small-satellite missions under the Orbital Services Program-4 (OSP-4) contract. The OSP-4 IDIQ contract, established in 2019, allows for an indefinite quantity of supplies or services during a fixed period, with the government placing orders as needs arise. Blue Origin's inclusion comes after its selection for the National Security Space Launch Phase 3 Lane 1

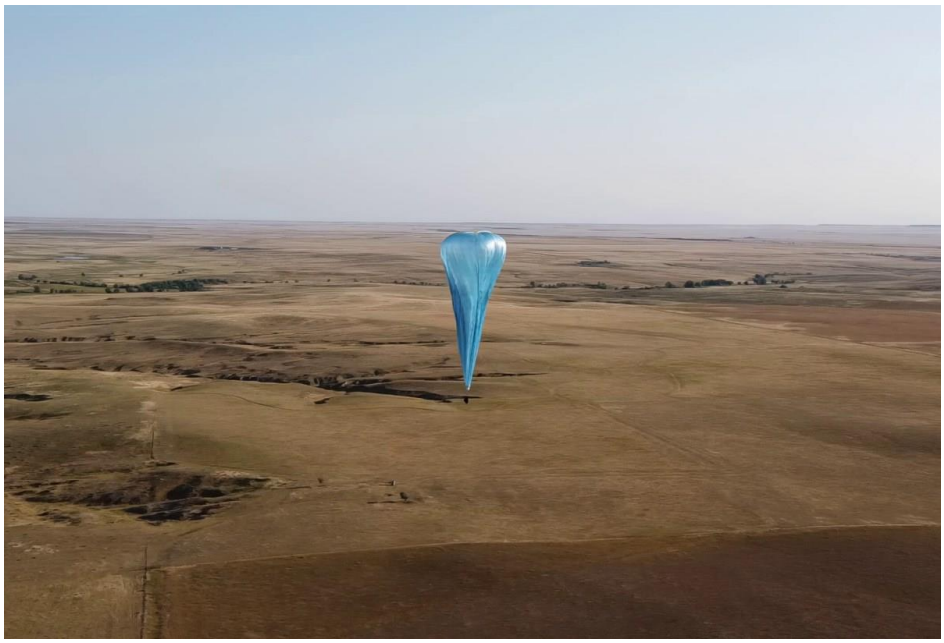
procurement, suggesting its New Glenn rocket will begin payload launches within the next year. Stoke Space recently conducted its first hot-fire test and is targeting its first orbital test launch in 2025. Read more. *(SpaceNews)*

Space Force seeks bids for 'Resilient GPS' satellite program. The US Space Force has issued a solicitation for its "Resilient Global Positioning System" (R-GPS) program, seeking innovative design concepts from members of the Space Enterprise Consortium. The R-GPS aims to augment the existing GPS constellation with smaller, cheaper satellites that provide a subset of primary GPS signals compatible with both military and civilian receivers. The program is not intended to replace the current GPS system or the ongoing GPS IIIF program, but rather serve as a complementary system providing an additional layer of resilience for military, allied, and civilian users. Read more. *(SpaceNews)*

Collins Aerospace pulls back from NASA spacesuit contract. Collins Aerospace has pulled back from developing spacesuits for NASA's International Space Station, citing delays and cost overruns. The company had been working on a suit for ISS use under a contract awarded two years ago, but mutually agreed with NASA to "descope" the project due to timeline issues. This decision comes as NASA grapples with ongoing spacesuit problems on the station, including recent scrubbed spacewalks and concerns over the aging Extravehicular Mobility Units (EMUs). Read more. *(SpaceNews)*

Urban Sky wins NASA award to develop balloon-borne fire sensors. Urban Sky, a Denver-based startup, has won a $2.6 million NASA grant to develop a wildfire monitoring system using stratospheric balloons. The three-year project will improve the geolocation accuracy of a thermal infrared sensor and add image downlink capabilities, allowing firefighters to receive real-time data. The system will operate in detection mode for new wildfires and perimeter mapping mode to monitor fire growth. Urban Sky's system will offer higher resolution than satellite-based systems, with an estimated 3.5-meter thermal infrared imagery capability. Read more. *(SpaceNews)*

Urban Sky Says its Series A Round Will Allow it to Expand its Commercial Imaging Services



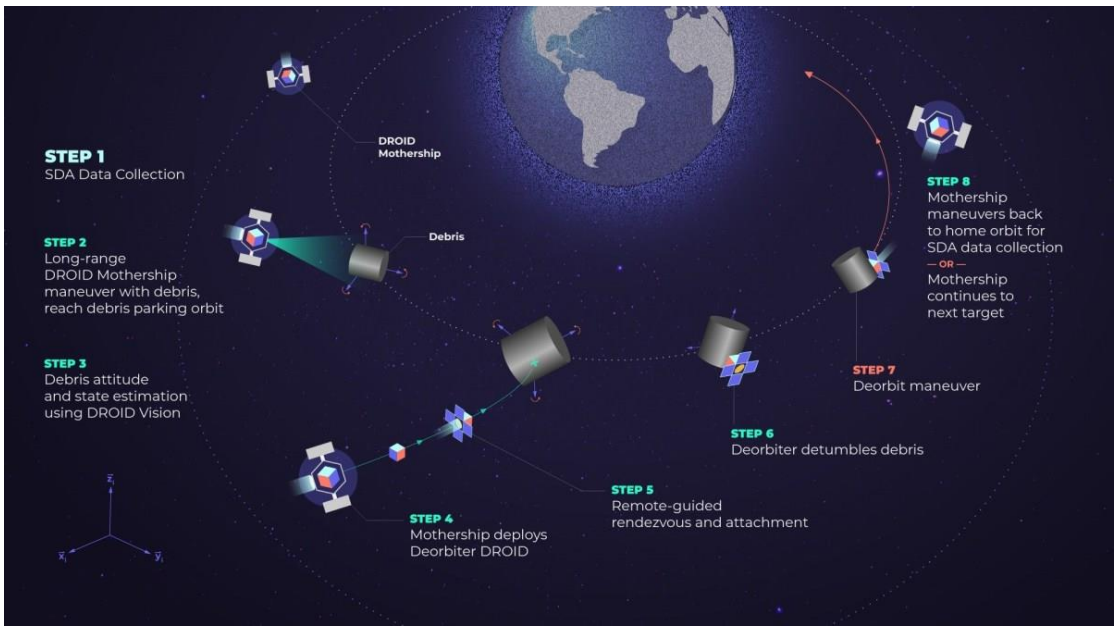
Source: Intro-act, NASA

NASA awards SpaceX contract for space station deorbit vehicle. NASA has awarded SpaceX a contract valued at up to $843 million to develop the United States Deorbit Vehicle (USDV) that will perform the final phases of the International Space Station's deorbiting around 2030. The USDV will dock with the ISS and conduct controlled reentry maneuvers over a remote ocean region. NASA emphasized the importance of vehicle reliability, requiring the

spacecraft to function on its first flight and have sufficient redundancy and anomaly recovery capability. The contract covers development of the spacecraft, with NASA conducting a later procurement for launching the USDV. Read more. *(SpaceNews)*

Turion wins Space Force contract for debris-capture technology. Turion Space, an Irvine-based startup, has secured a $1.9 million contract from the U.S. Space Force's technology arm to develop autonomous spacecraft docking and maneuvering system for debris-capture technology. The company aims to advance technologies for engaging uncooperative space objects and facilitating deorbit of inactive satellites. Turion plans to demonstrate its technology as early as 2026, featuring a Droid mothership hosting micro-Droids equipped with capturing devices. Read more. *(SpaceNews)*

Illustration by Turion Space



Source: Intro-act, Space News

U.S. military to award $3 billion contract for AI-driven intelligence. The US military is set to award a $3 billion multi-year contract for commercial data and analytics services to monitor potential threats across the Indo-Pacific region. The Long-Range Enterprise Intelligence, Surveillance, and Reconnaissance Activity (LEIA) program seeks AI-driven analytics integrating information from ground, aerial, and space-based platforms. The contract will be awarded later this year through a full and open competition, with several firms expected to compete. Read more. *(SpaceNews)*

Airbus Awarded €2.1 billion contract for German next-gen military satellites. Airbus has been awarded a €2.1 billion contract to lead the SATCOMBw 3 project for Germany's armed forces, developing two advanced geostationary satellites and an upgraded ground segment for 15 years. The new satellites, based on the Eurostar Neo platform, will replace existing ones and feature cutting-edge technology to handle increasing demand for secure data transfer. The contract also involves German industrial partners, including OHB from Bremen, to strengthen national capabilities. Read more. *(Space Impulse)*

NGA selects orbital insight for project Aegir to enhance maritime domain awareness. The National Geospatial-Intelligence Agency (NGA) has selected Orbital Insight for up to $2 million in pilot funding under Project Aegir, a program aimed at enhancing maritime domain awareness. The project focuses on identifying and tracking illicit maritime activities within the U.S. Indo-Pacific Command's jurisdiction. NGA's Commercial Solutions Opening (CSO)

process, which took less than 90 days, allowed 82 teams to compete, with Orbital Insight emerging as the winner after pitching their solution alongside 11 other finalists. Read more. *(Space Impulse)*

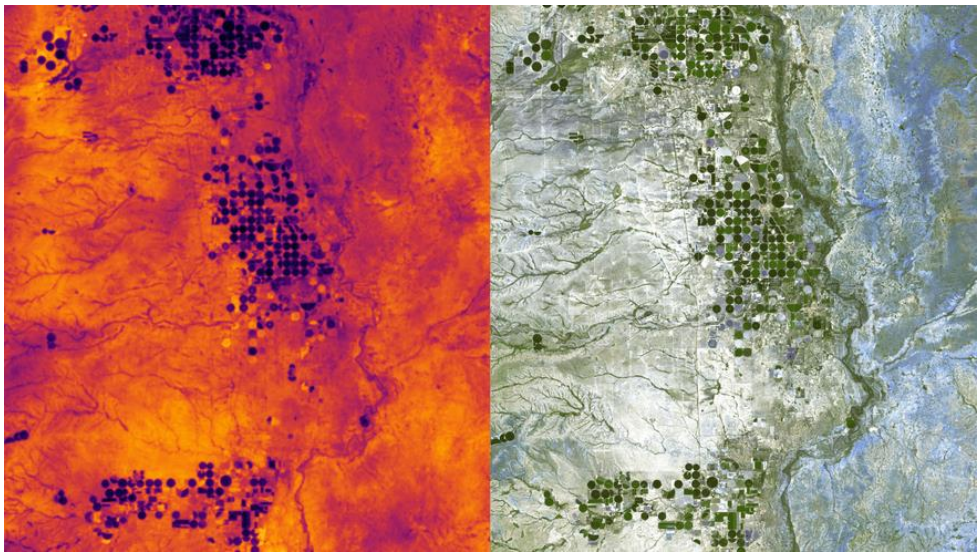
COMPANY NEWS AND EARNINGS

Scout Space selected for DARPA's commercial tech initiative. DARPA has selected Scout Space, a startup based in Reston, Virginia, to participate in its BRIDGES consortium, which aims to connect innovative small companies with classified Department of Defense research and development efforts. Scout Space develops satellite flight software and space domain awareness sensors and was chosen for its proposal outlining an approach to "advancing autonomous in-space threat response." The agency will sponsor Scout's facility clearance, enabling the startup to work in secure areas and access classified networks. Read more. *(SpaceNews)*

MDA Space taps Aerospacelab for satellite components. MDA Space, a Canadian space technology firm, selected Belgium-based Aerospacelab to supply over 200 battery charge regulators for its new line of satellites, Aurora, starting in 2026. This deal marks another step in MDA Space's supply chain development for Aurora, which operates across multiple non-geostationary orbits and frequencies. The partnership follows recent deals with Jena-Optronik and Huber+Suhner to provide star trackers and connectors respectively. Read more. *(SpaceNews)*

Hydrosat to launch its first thermal infrared sensor. Washington-based startup Hydrosat is set to launch its first thermal-infrared instrument into orbit on July 8 aboard SpaceX's Transporter-11 rideshare flight. The instrument, designed to measure water stress in agriculture, will fly on Loft Orbital's YAM-7 mission and feed into the company's existing software platform IrriWatch, serving customers in 38 countries. Hydrosat aims to build a constellation to acquire global, daily, field-scale thermal-infrared data, filling a gap in the market left by government programs. Read more. *(SpaceNews)*

Hydrosat Thermal Infrared Imagery of New Mexico And its Visual Imagery Counterpart



Source: Intro-act, Space News, Hydrosat

EnduroSat gets order for Botswana's debut satellite. EnduroSat, a European microsat specialist, has partnered with Botswana International University of Science and Technology (BIUST) to build Botswana's first satellite, Botsat-1. The 3U cubesat will feature a hyperspectral sensor to gather data on ground composition, supporting mining and agriculture businesses in the country. Funded by Botswana's government, the satellite is scheduled to launch on SpaceX's Transporter-13 mission in February, providing data for long-term planning and investments. BIUST

engineers will assist with assembly and payload integration in Sofia, Bulgaria, and operate the satellite from within Botswana using EnduroSat's mission operations software. Read more. *(SpaceNews)*

Firefly Aerospace launches NASA-sponsored cubesats. Firefly Aerospace successfully launched its Alpha rocket from Vandenberg Space Force Base in California, deploying eight NASA-sponsored cubesats into a Low Earth Orbit. The mission, called Educational Launch of Nanosatellites (ELaNa 43), carried cubesats developed by universities and NASA's Johnson Space Center, as well as one from a nonprofit group. This was Firefly's first launch since an upper stage malfunction in December 2023, which stranded its payload into a low orbit. The company completed a second stage relight and nominal plane change following deployment of the cubesats. Read more. *(SpaceNews)*

Planet lays off 17% of its workforce. Planet, an Earth Observation company, announced layoffs affecting about 180 employees, or 17% of its workforce, as part of efforts to reduce costs and improve operational efficiency. The move follows a similar layoff in July 2023, which also aimed to align resources with market opportunities and support long-term growth. Planet expects charges of $9.5 million to $10.5 million for severance and termination costs but is not adjusting earlier guidance on quarterly revenues and adjusted EBITDA loss. The company remains focused on achieving adjusted EBITDA profitability in Q4 of this fiscal year and has $276 million of cash on hand with no debt. Read more. *(SpaceNews)*

MDA Space receives contract for next phase of lunar Gateway robotic arm development. MDA Space has received a $1 billion Canadian contract from the Canadian Space Agency to develop the next phase of the Canadarm3 robotic arm system for the lunar Gateway. The contract covers final design and assembly of the system, with work scheduled through March 2030. This marks a major milestone in the company's strategy to build its backlog and bring new commercial space products and services to market. Read more. *(SpaceNews)*

Innospace shares tumble in stock market debut. South Korean launch vehicle startup Innospace saw its shares fall by 20.4% in its first day of trading as a public company July 2, closing at 34,450 won ($24.80) on the KOSDAQ exchange. The company raised 57.6 billion won from its initial public offering (IPO), which priced shares at 43,300 won. Innospace plans to use the funding to expand vehicle production, incorporate reusability into its vehicles, and hire more employees. Read more. *(SpaceNews)*

KBR to acquire defense and space contractor LinQuest for $737 million. KBR has agreed to acquire LinQuest Corp., a national security space systems specialist, for $737 million. The deal aims to bolster KBR's footprint in the national security space sector. LinQuest, acquired by Madison Dearborn Partners in 2018, focuses on engineering, data analytics, and digital integration for national security space missions. It has secured major contracts with the U.S. Space Force, including a $500 million, five-year deal and a potential nine-year, $200 million contract. KBR, which provides services to governments worldwide, is expected to close the acquisition in Q3 or Q4 2024, subject to regulatory approvals. Read more. *(SpaceNews)*

Astra completes deal to go private. Astra Space completed its deal to go private on July 18, ending its time as a publicly traded company after over three years. The company agreed to take itself private at 50 cents per share, a significant drop from its peak value in 2021 when shares were valued at several billion dollars. Astra's market capitalization has fallen by more than 99% since going public in July 2021, and the company had considered bankruptcy before accepting the deal offered by co-founders Chris Kemp and Adam London. Read more. *(SpaceNews)*

Booz Allen Ventures invests in space tech startup Quindar. Booz Allen Ventures, the corporate venture capital arm of Booz Allen Hamilton, has invested in Quindar, an early-stage commercial space technology company that automates satellite operations through its platform. The investment aims to support Quindar's goal of "democratizing space" by providing IT infrastructure for satellites. Founded in 2022, Quindar's app allows satellite owners to analyze, test and operate their constellation with minimal human intervention. Booz Allen Ventures manages a $100 million fund and has previously invested in early-stage companies developing dual-use technologies. Read more. *(SpaceNews)*

Voyager Space partners with Palantir to propel space and defense innovation. Voyager Space and Palantir Technologies have formed a strategic partnership to integrate advanced AI into the space and defense sectors. The collaboration aims to boost technological progress by incorporating Palantir's sophisticated AI tools into Voyager's operations, enhancing defense and commercial solutions. The partnership will optimize data processing for flight and testing on solid fuel thrusters, improve communications, research, and intelligence within the space sector, making it more accessible and efficient. Read more. *(Space Impulse)*

Dhruva Space and Kinéis partner to expand IoT in India. Dhruva Space, an Indian space engineering firm, has partnered with French satellite operator Kinéis to expand IoT services in India. The partnership will integrate Kinéis' IoT connectivity within India and launch a Kinéis IoT payload on Dhruva Space's upcoming P-30 satellite. This collaboration aims to deliver affordable and reliable IoT solutions, fostering innovation in the Indian market. Dhruva Space will introduce Kinéis' IoT services in India, exploring new applications supported by Kinéis' 25-satellite constellation, while Kinéis plans to deploy its full constellation by early 2025 with Dhruva Space supporting end-user terminal development and manufacturing in India. Read more. *(Space Impulse)*

Space Station Startup Gravitics will build space infrastructure for Axiom Station. Aerospace startup Gravitics has signed a $125-million contract with Axiom Space to provide a pressurized spacecraft that will support operations at Axiom Station, one of the most advanced platforms in Low-Earth Orbit. The Gravitics spacecraft will offer various services while attached to the station and is expected to play a crucial role in supporting Axiom's commercial space station. Gravitics has been testing its propulsion system and plans to launch a spacecraft by 2026. Read more. *(Orbital Today)*

Propulsion Test Firing at Gravitics' Washington Facility; Commercial Space Station Product Lineup with a Human for Scale

Source: Intro-act, Orbital Today

Virgin Galactic unveils new manufacturing facility in Arizona. Virgin Galactic has completed its new manufacturing facility in Mesa, Arizona, which will handle the final assembly of next-generation Delta spaceships starting Q1 2025. The facility's initial team is preparing to install tooling by Q4 2024, with major subassemblies arriving next year. Virgin Galactic aims to complete ground testing and ferry the spaceships to Spaceport America in New Mexico for flight tests before commercial operations begin in 2026. The Mesa facility features two hangars with multiple bays, utilizing digital twin technology for real-time collaboration between suppliers. Read more. *(Space Impulse)*

Airbus and Thales reportedly considering space activity collaboration amid competitive pressures. Airbus and Thales are reportedly exploring potential collaboration on their satellite activities amid increasing competition from new players like SpaceX. The goal is to address challenges and strengthen their positions in the European telecommunications, navigation, and surveillance satellite market. The companies have historically dominated this market, but face pressure from new competitors. Airbus has struggled with its space services business, leading to financial charges, while Thales Alenia Space reported sales of 2.2 billion euros in 2023. Read more. *(Space Impulse)*

Raytheon and Avio partner to advance solid rocket motor development. Raytheon, under RTX, has partnered with Avio to advance solid rocket motor development for defense applications, aiming to mature the motors into production-ready state. The partnership will develop and mature potential rocket motor solutions to meet increased demand from domestic and international customers. Avio will invest in capability and capacity to support immediate customer demand, leveraging its Italian manufacturing and engineering teams' existing capabilities to facilitate domestic solid rocket motor manufacturing strategy. Read more. *(Space Impulse)*

Amazon's Project Kuiper expects to ship the first satellites this summer. Amazon's Project Kuiper, a satellite constellation initiative to provide global broadband Internet connectivity, expects to ship its first completed production satellites this summer. The project, which began research and development in 2018, received FCC approval in July 2020. Amazon launched the first two prototype satellites on October 6, 2023, with a successful mission paving the way for deploying the constellation this year and offering service to customers next year. Read more. *(Orbital Today)*

Amazon's Project Kuiper

Source: Intro-act, Orbital Today

Filtronic secures $9 million order for SpaceX's Starlink program. Filtronic has secured a $9 million order from SpaceX for its E-band Solid State Power Amplifier (SSPA) modules, crucial for deploying the Starlink constellation. The modules will provide high-speed and low-latency Internet worldwide. This order is part of a strategic partnership established in April 2024, with additional share warrants issued as part of the agreement. Filtronic plans to fulfill the order within the current financial year, marking a key milestone in their collaboration. Read more. *(Space Impulse)*

SPACETECH FUNDING ACTIVITY

Chart 14: Recent Funding Activity in the SpaceTech Sector (July 2024)

Company	Latest Fund Raise ($ Mn)	Round	Use of Funds	Investors
MinoSpace	137	Series C1	Successful implementation of major national and commercial missions like satellite Internet and Earth Observation	Wuxi Economic Development Zone Shangxian Industry Investment Fund, Liangxi Science and Technology Innovation Industry Fund, Qingdao Huizhu Anfulan
Airbus Defence and Space	2500	Government Funding	To develop and deploy next-generation communications satellites, SATCOMBw 3	German Military
Sift	17.5	Series A	To accelerate development and expand its platform for reviewing hardware sensor data	Google Ventures
Armada	40	Private	To develop mobile data centers tailored for SpaceX's Starlink broadband network	Microsoft led M-12
X-Bow	70	Series B	To expand production capabilities and complete a new manufacturing facility in Texas	Razor's Edge Lockheed Martin Ventures, Boeing Ventures, Crosslink Capital, Balerion Space Ventures
LiveEO	27.18	Series B	To expand its capabilities in turning satellite data into practical insights for climate risk management.	NordicNinja, DeepTech & Climate Fonds (DTCF)
ISPTech	2.17	Pre-Seed Funding	To advance its green propulsion technology for spacecraft	High-Tech Gründerfonds (HTGF), First Momentum Ventures, Possible Ventures
NorthStar Earth and Space	Not Disclosed	Shareholder Financing	Accelerating development of patented space-based Space Situational Awareness (SSA) technology.	Telesystem Space
FAST Aerospace	0.5435	Private	To develop a prototype of the ramjet engine that will power its carrier aircraft for the air-launched HyperDart rocket system	Galaxia

Source: Intro-act, Multiple Web Source

SPACETECH GOVERNMENT CONTRACT AWARDS

Chart 15: Government Contracts and Grants (July 2024)

Awardee Company	Awarding Agency	Country	Contract Value (in $ mln)	Project / Program
SpaceX	NASA	U.S	69	SpaceX to launch the Compton Spectrometer and Imager (COSI) spacecraft on a Falcon 9.
Blue Origin and Stoke Space	U.S. Space Force	U.S	Not Disclosed	To compete for small satellite missions under Orbital Services Program-4 (OSP-4) contract
Urban Sky	NASA	U.S	2.6	To develop a wildfire monitoring system using stratospheric balloons
SpaceX	NASA	U.S	843	To develop the United States Deorbit Vehicle (USDV) that will perform the final phases of the International Space Station's deorbiting around 2030
Turion	Space Force	U.S	1.9	To develop autonomous spacecraft docking and maneuvering system for debris-capture technology
Airbus Defence and Space	German Military	Germany	2280	To develop and deploy next-generation communications satellites, SATCOMBw 3
Orbital Insight	National Geospatial-Intelligence Agency (NGA)	U. S	2	Project Aegir, a program aimed at enhancing maritime domain awareness

Source: Intro-act, Multiple Web Sources

SPACETECH ETFs

ARK Space Exploration & Innovation ETF (ARKX)

Closing Price (07/25/24)	**$15.19**	**1-Week NAV Change**	**-2.26%**	**NAV Change (YTD)**	**-1.94 %**
AUM (as of 07/25/24)	**$230.95 Mn**	**Fund Inception**	**3/30/2021**	**Expense Ratio**	**0.75%**

ARKX is an actively managed Exchange Traded Fund (ETF) that seeks long-term growth of capital by investing under normal circumstances primarily (at least 80% of its assets) in domestic and foreign equity securities of companies that are engaged in the Fund's investment theme of Space Exploration and Innovation. The advisor defines "Space Exploration" as leading, enabling, or benefitting from technologically enabled products and/or services that occur beyond the surface of the Earth, including 1) Orbital Aerospace Companies: companies that launch, make, service, or operate platforms in orbital space, including satellites and launch vehicles; 2) Suborbital Aerospace Companies: companies that launch, make, service, or operate platforms in suborbital space; 3) Enabling Technologies Companies: companies that develop technologies used by Space Exploration-related companies for successful value-add aerospace operations, including AI, robotics, 3D printing, materials, and energy storage; and 4) Aerospace Beneficiary Companies: companies whose operations stand to benefit from aerospace activities, including agriculture, Internet access, GPS, construction, imaging, drones, air taxis, and electric aviation vehicles."

Monthly Market Performance (Month Ending 07/25/2024)

One Month	Three Months	Six Months	YTD	One Year	Inception
1.82%	**5.08%**	**4.93%**	**-1.95%**	**-0.79%**	**-25.57%**

Quarterly Market Performance (Quarter Ending 06/30/2024)

One Month	Three Months	Six Months	YTD	One Year	Inception
-1.06%	**1.84%**	**2.12%**	**-0.73%**	**-1.52%**	**-26.45%**

Top 10 Holdings (Updated as of 07/25/24)

Ticker	Company	% of Funds	Market Value
KTOS	KRATOS DEFENSE & SECURITY	9.67%	$22,114,268.80
IRDM	IRIDIUM COMMUNICATIONS INC	8.08%	$18,480,537.18
AVAV	AEROVIRONMENT INC	7.16%	$16,365,598.83
TER	TERADYNE INC	7.01%	$16,031,982.60
TRMB	TRIMBLE INC	6.59%	$15,072,030.10
LHX	L3HARRIS TECHNOLOGIES INC	5.81%	$13,282,534.35
6301	KOMATSU LTD	4.83%	$11,034,997.01
ACHR	ARCHER AVIATION INC-A	3.94%	$9,017,189.22
AMZN	AMAZON.COM INC	3.60%	$8,230,296.62
RKLB	ROCKET LAB USA INC	3.50%	$8,001,267.92
BLDE	BLADE AIR MOBILITY INC	2.98%	$6,811,101.50

For more information on ARKX visit: https://ark-funds.com/funds/arkx/

SPACETECH ETFs

Procure Space ETF (UFO)

Closing Price (07/25/24)	**$ 17.05**	**1-Week NAV Change**	**3.29%**	**NAV Change (YTD)**	**- 6.0%**
AUM (as of 07/25/24)	**$ 30.79 Mn**	**Fund Inception**	**4/10/2019**	**Expense Ratio**	**0.75%**

The Procure Space ETF (UFO) is comprised of a portfolio of companies involved in space-related industries. UFO is an exchange traded fund (ETF) seeking investment results that correspond generally to the performance, before fund fees and expenses, of the S-Network Space Index (SPACE) developed by S-Network Global Indexes. Although there is no legal definition of "space," a commonly accepted definition is that the edge of space begins at the Kármán Line, which is 100 kilometers (62 miles) above the Earth's surface.

Monthly Market Performance (Month Ending 07/25/2024)

One Month	Three Months	Six Months	YTD	One Year	Inception
12.80%	**14.34%**	**3.91%**	**-6.00%**	**-10.10%**	**-30.22%**

Quarterly Market Performance (Quarter Ending 06/30/2024)

One Month	Three Months	Six Months	YTD	One Year	Inception
-2.14%	**-5.93%**	**-14.20%**	**-14.20%**	**-16.35%**	**-36.32%**

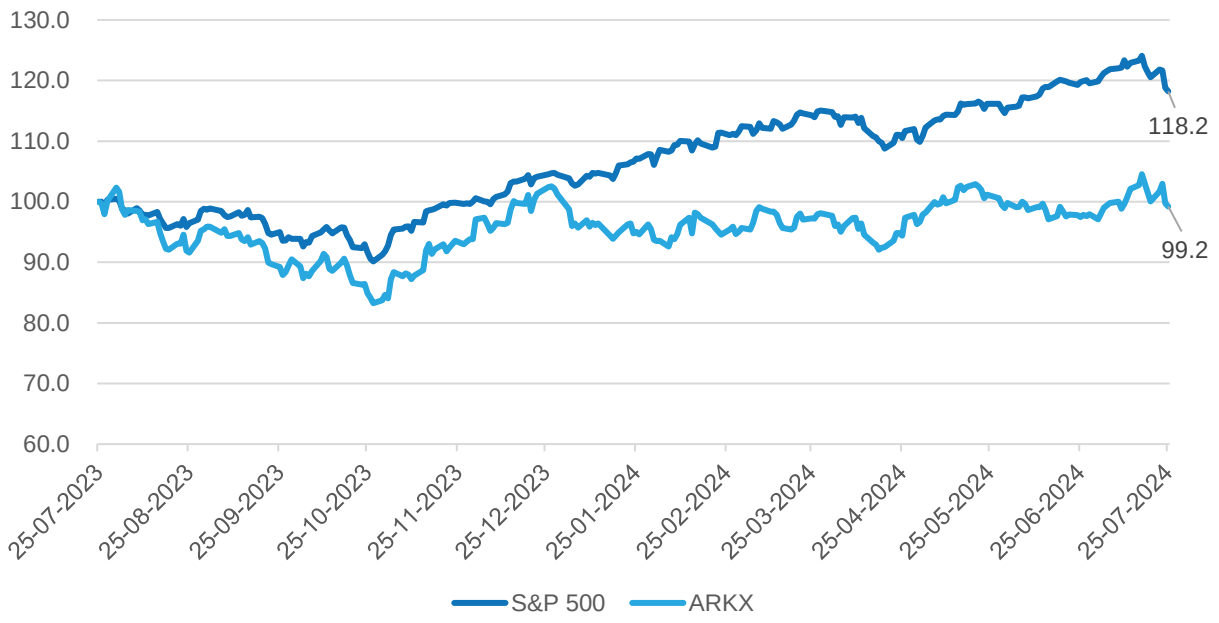
Top 10 Holdings (Updated as of 07/25/24)

Ticker	Company	% of Funds	Market Value (in billions)
GRMN	Garmin Ltd.	4.67%	33.306
SIRI	Sirius XM Holdings, Inc.	6.57%	15.079
TRMB	Trimble Inc.	4.50%	13.358
SATS	EchoStar Corporation Class A	4.77%	5.341
ASTS	AST SpaceMobile, Inc. Class A	6.09%	4.48
IRDM	Iridium Communications Inc.	4.50%	3.291
RKLB	Rocket Lab USA, Inc.	5.21%	2.587
VSAT	ViaSat, Inc.	5.51%	2.376
GSAT	Globalstar, Inc.	5.03%	2.317
MDA	MDA Space Ltd	4.86%	1.582
9412	SKY Perfect JSAT Holdings Inc.	4.44%	1.414

For more information on UFO visit: etf.com, Yahoo Finance

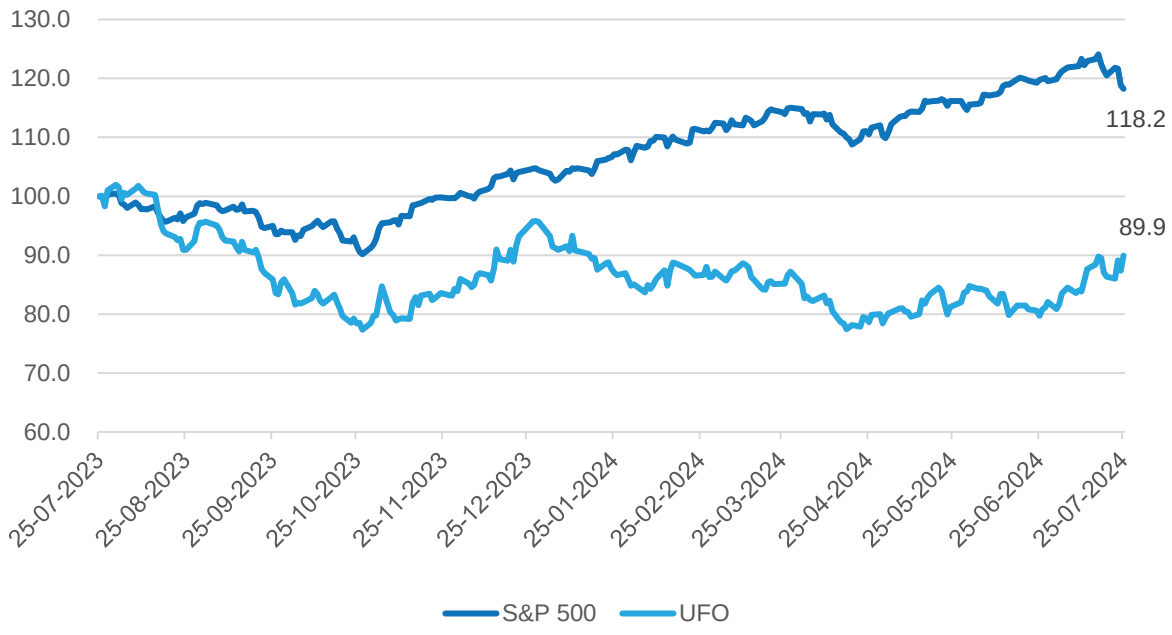
SPACETECH ETFs

ARKX vs. S&P 500



Source: Intro-act, Yahoo! Finance

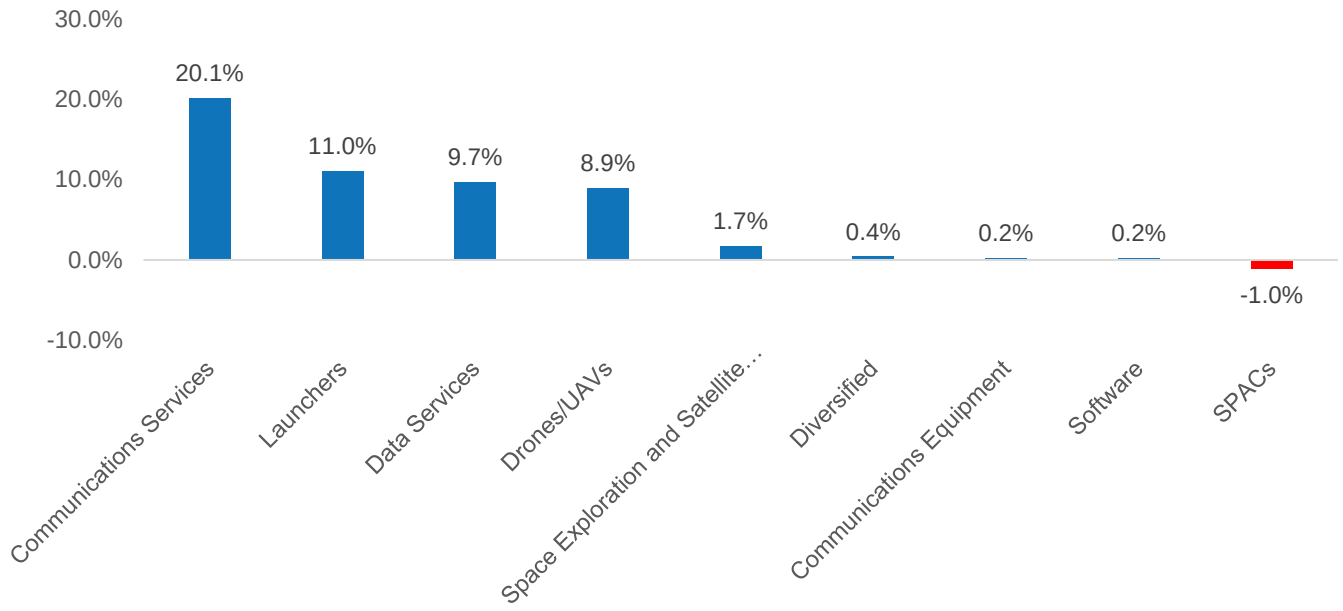
UFO vs. S&P 500



Source: Intro-act, Yahoo! Finance

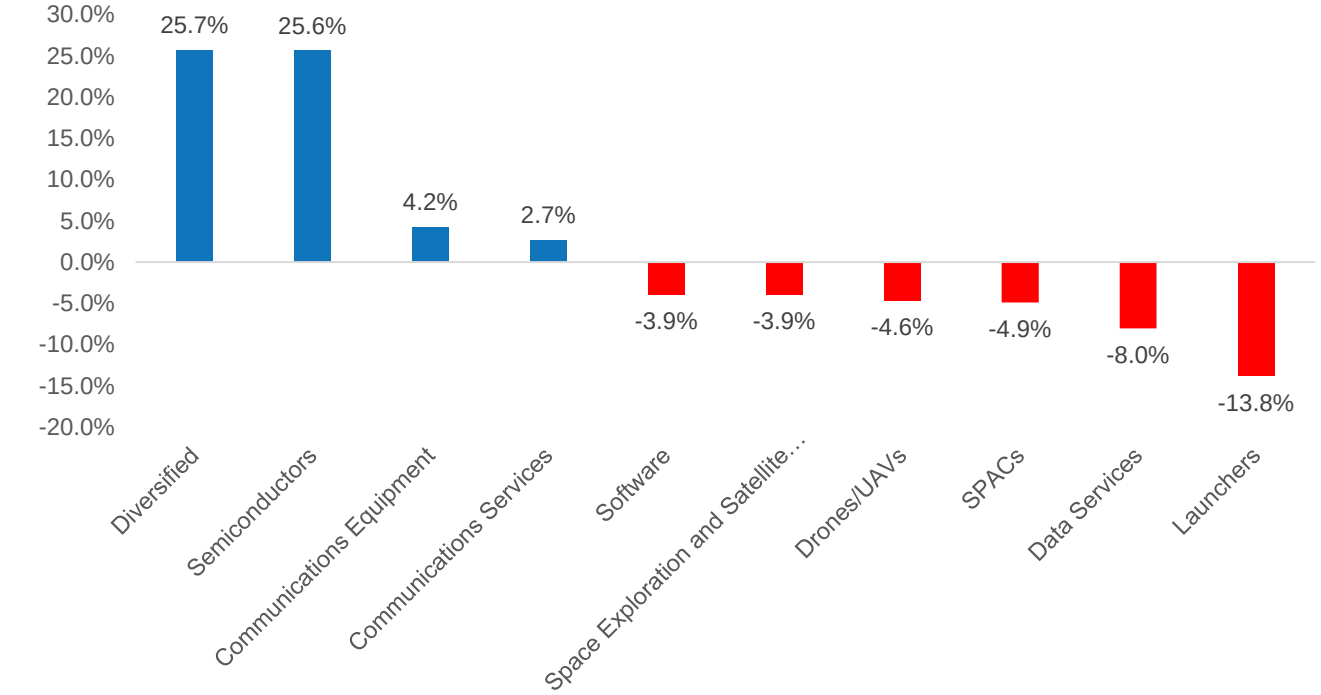
LEADERS AND LAGGARDS – SPACETECH SEGMENTS

M/M Returns by SpaceTech Segments



Source: Intro-act, FactSet. Data as of July 25, 2024

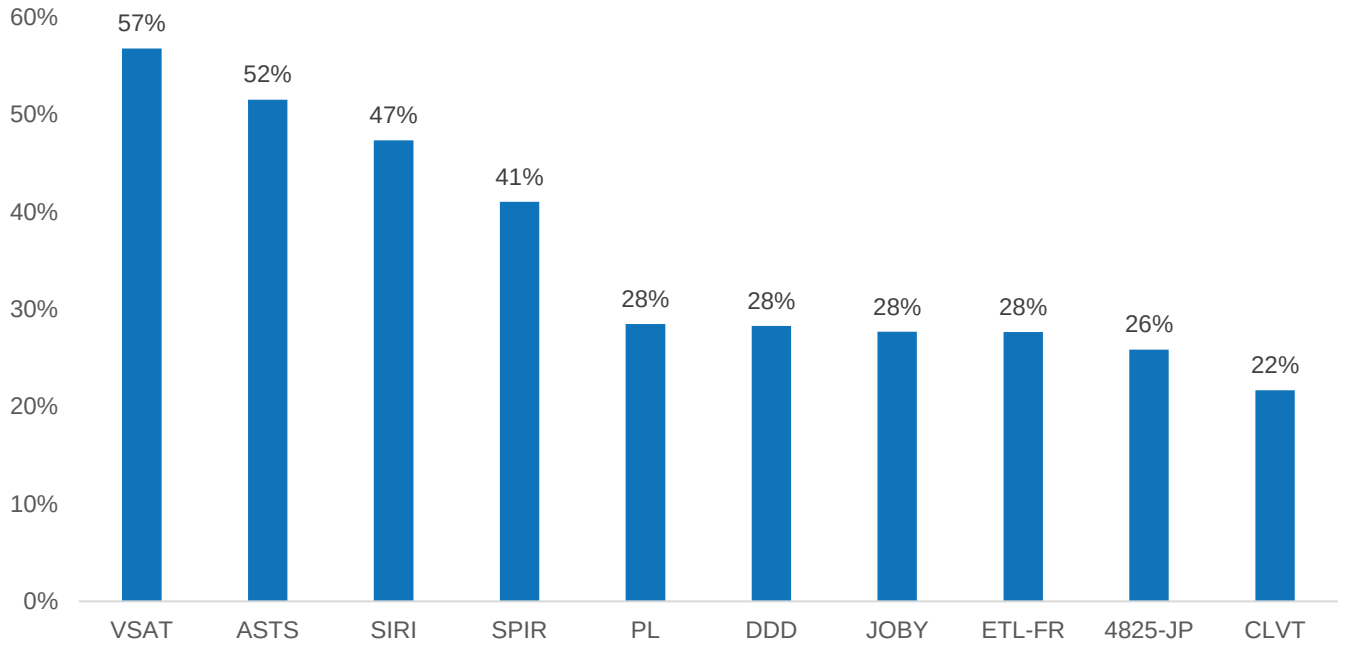
YTD Returns by SpaceTech Segments



Source: Intro-act, FactSet. Data as of July 25, 2024

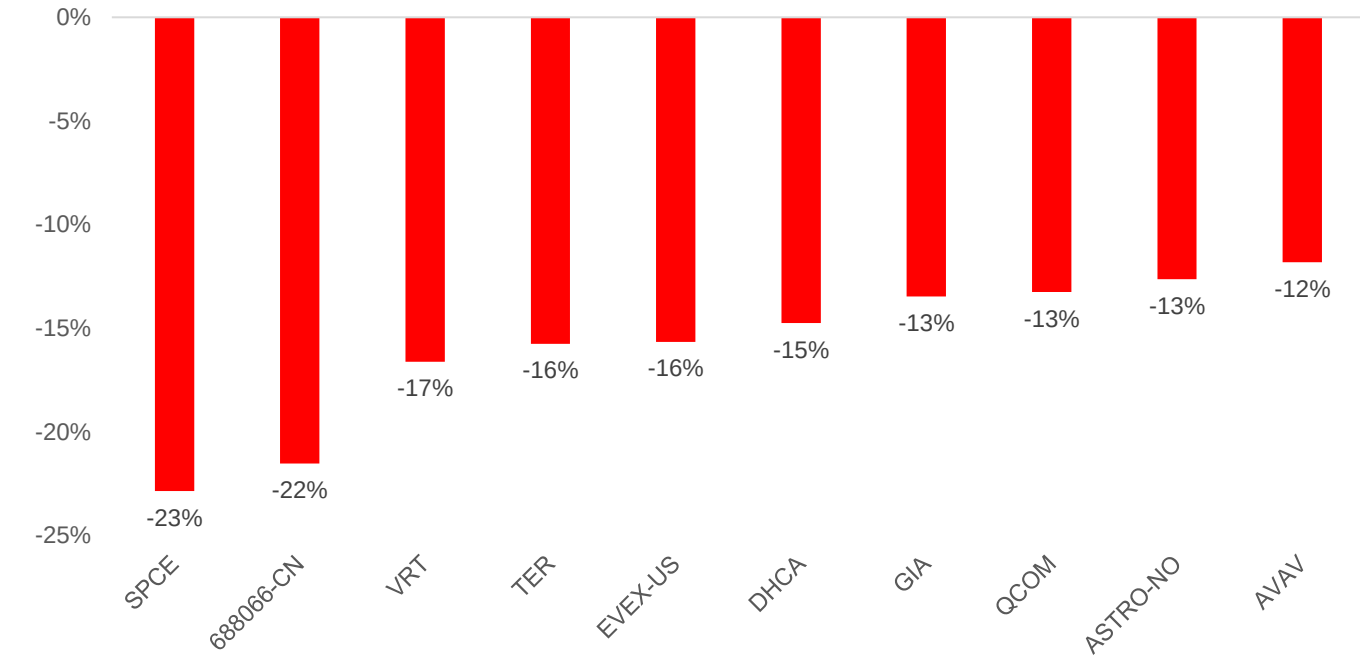
LEADERS AND LAGGARDS – SPACETECH STOCKS

M/M Top 10 SpaceTech Gainers



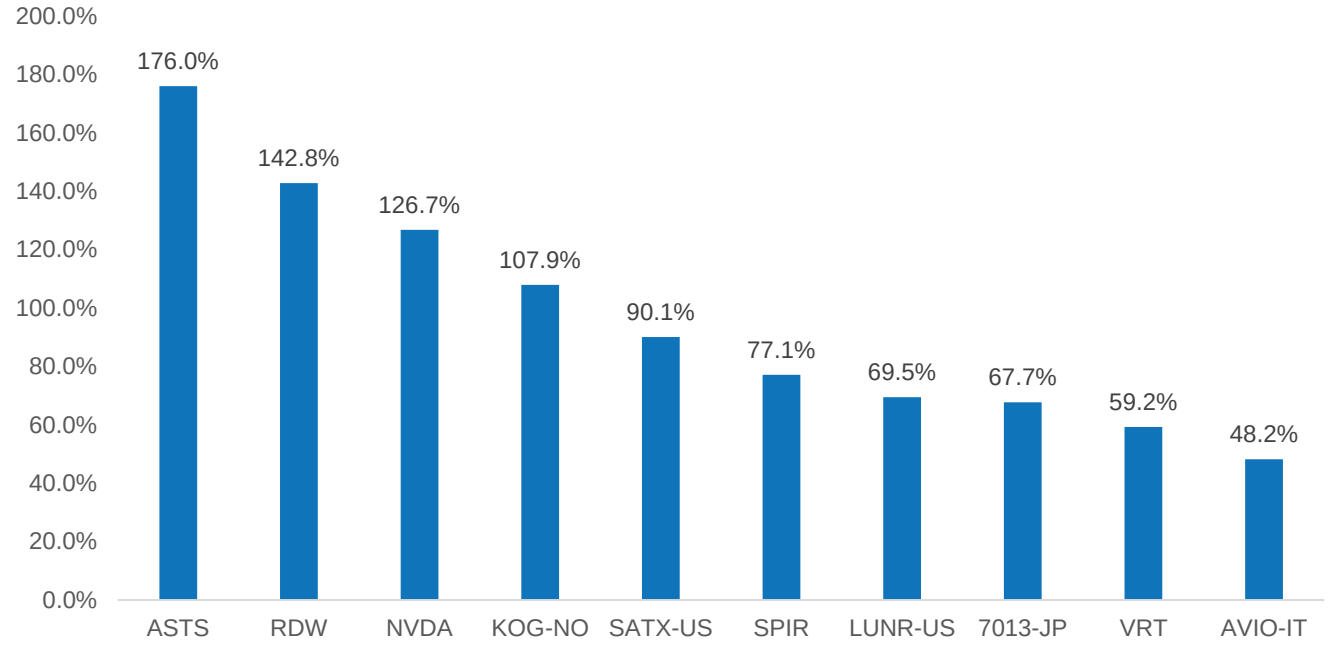
Source: Intro-act, FactSet. Data as of July 25, 2024

M/M Top 10 SpaceTech Losers



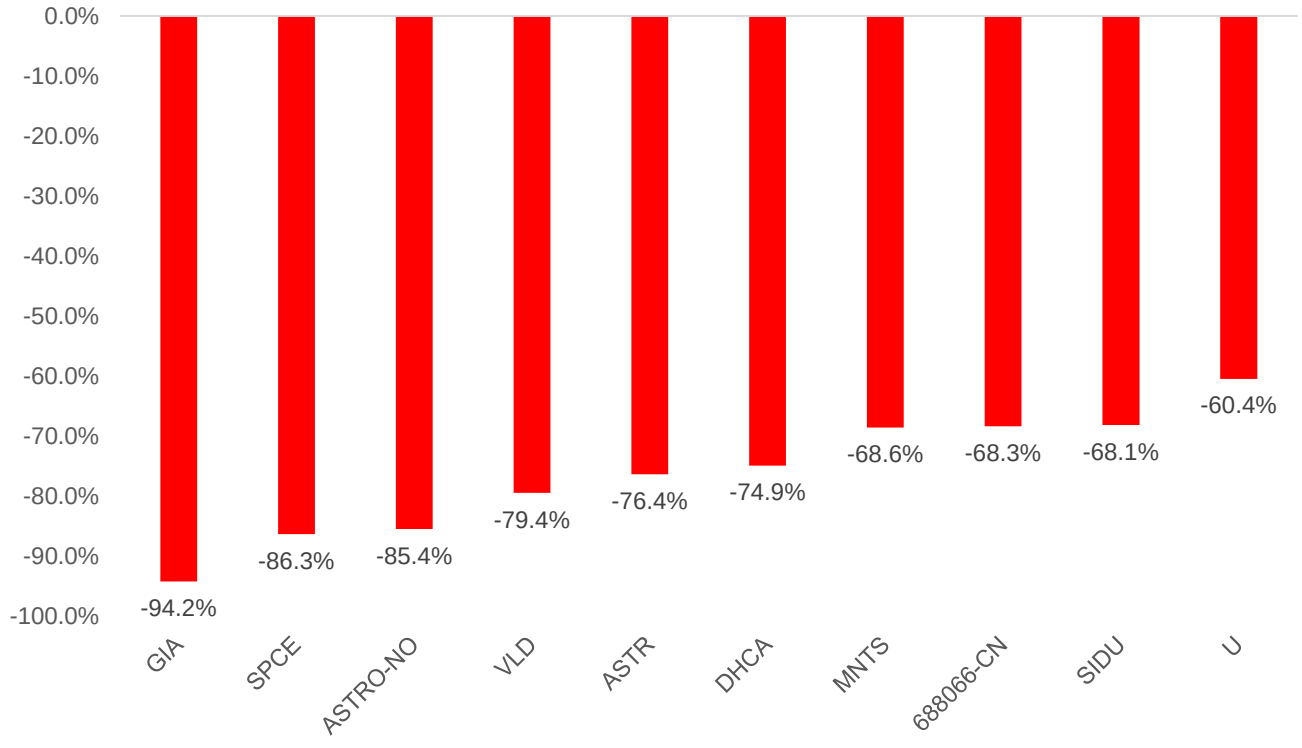
Source: Intro-act, FactSet. Data as of July 25, 2024

YTD Top 10 SpaceTech Gainers



Source: Intro-act, FactSet. Data as of July 25, 2024

YTD Top 10 SpaceTech Losers



Source: Intro-act, FactSet. Data as of July 25, 2024

SPACETECH EVENTS CALENDAR

SpaceTech Industry Events Calendar

S. No.	Event Name	Place	Date
1	Space-Comm Expo Scotland	Glasgow, Scotland	September 11, 2024
2	SPAICE: AI in and for Space	United Kingdom	September 15, 2024
3	World Space Business Week 2024: Bringing Together the World's Industry Leaders	Vendôme, France	September 16, 2024
4	Space Defense & Security Summit	Paris, France	September 17, 2024

Source: Intro-act, Multiple Web Sources

SPACETECH LAUNCH CALENDAR – UPCOMING MONTH

Space Launches Across the Globe (as of July 26, 2024)

Date	Company	Rocket	Mission	Launch Site
August 2024	SpaceX	Falcon 9	WorldView Legion 3 & 4	SLC-40, Cape Canaveral Space Force Station, Florida
August 2024	SpaceX	Falcon 9	Transporter-11	SLC-4E, Vandenberg Space Force Base, California
3rd Quarter 2024	SpaceX	Falcon 9	BlueBird Block 1	SLC-40, Cape Canaveral Space Force Station, Florida

Source: Intro-act, Spaceflight Now

SPACETECH SPACs

SpaceTech – Active SPACs

SPAC Name (Ticker)	Trust Size ($ Mn)	Status	Target (If announced)	EV ($ Mn)	Announced Date	Estimated Closing Date
Broad Capital Acquisition Corp. (BRAC)	102	Definitive Agreement	Openmarkets Group	90	-	8/13/2024
Aurvandil Acquisition Corp. (AURV)	250	S-1 Filed	-	-	-	-
Deep Space Acquisition Corp. I (DPAC)	210	S-1 Filed	-	-	-	-
Mission Control Acquisition Corp.	100	S-1 Filed	-			
Slam Corp	< 99	Definitive Agreement	Lynk Global	800	-	12/25/2024
Mission Space Acquisition Corp	100	S-1 Filed	-	-	-	-

Source: Intro-act, Boardroom Alpha. Status as of 07/26/24.

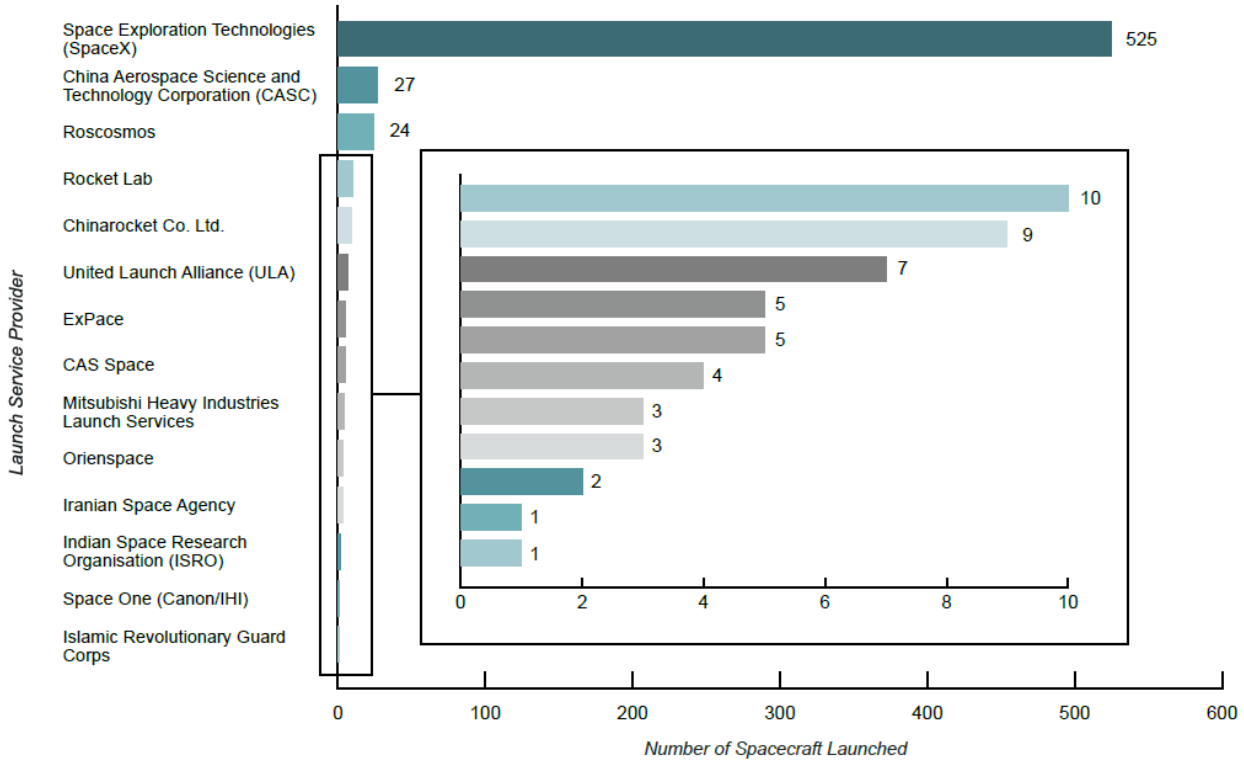
SpaceTech SPACs – Completed Transactions

DE-SPAC (Ticker)	SPAC	Segment	Announced Date	Closing Date	EV ($ Mn)	Current EV ($ Mn)
Virgin Galactic (NYSE: SPCE)	Social Capital Hedosophia	Space Exploration	9-Jul-19	25-Oct-19	1,502	103
Momentus (NSDQ: MNTS)	Stable Road Acquisition Corp.	Satellite & Components	7-Oct-20	12-Aug-21	1,200	(2)
AST SpaceMobile (NSDQ: ASTS)	New Providence Acquisition Corp.	Communication Services	16-Dec-20	6-Apr-21	1,392	356
Astra Space (NSDQ: ASTR)	Holicity, Inc.	Satellite Launch Services	2-Feb-21	30-Jun-21	2,123	18
BlackSky (NYSE: BKSY)	Osprey Technology Acquisition Corp.	Satellite & Components	18-Feb-21	9-Sep-21	1,106	185
Rocket Lab (NSDQ: RKLB)	Vector Acquisition Corp.	Satellite Launch Services	1-Mar-21	25-Aug-21	4,082	1,936
Spire Global (NYSE: SPIR)	NavSight Holdings, Inc.	Data Services	1-Mar-21	16-Aug-21	1,230	172
Redwire Space (NYSE: RDW)	Genesis Park Acquisition Corp.	Satellite & Components	25-Mar-21	2-Sep-21	615	355
Arqit Quantum (NSDQ: ARQQ)	Centricus Acquisition Corp.	Data Services	12-May-21	3-Sep-21	1,026	40
Planet Labs (NYSE: PL)	dMY Technology Group, Inc. IV	Data Services	7-Jul-21	7-Dec-21	2,250	370
Satellogic (NSDQ: SATL)	CF Acquisition Corp. V	Data Services	6-Jul-21	25-Jan-22	850	73
Terran Orbital (NYSE: LLAP)	Tailwind Two Acquisition Corp.	Satellite & Components	28-Oct-21	28-Mar-22	1,575	278
Eve Holding, Inc. (NYSE: EVEX)	Zanite Acquisition Corp.	Data Services	21-Dec-21	9-May-22	2,372	2,047
SatixFy (NYSEAMERICAN: SATX)	Endurance Acquisition Corp.	Communication Services	8-Mar-22	27-Oct-22	632	94
Intuitive Machines (Nasdaq: LUNR)	Inflection Point Acquisition Corp	Space Exploration	16-Sep-22	14-Feb-23	416	674

Source: Intro-act, Hogan Lovells. EV = Pro-forma enterprise value when the transaction agreement was announced

SPACETECH LAUNCH TRENDS – Q12024

In Q1, SpaceX Launched 525 Spacecraft, The Most of Any Launch Provider

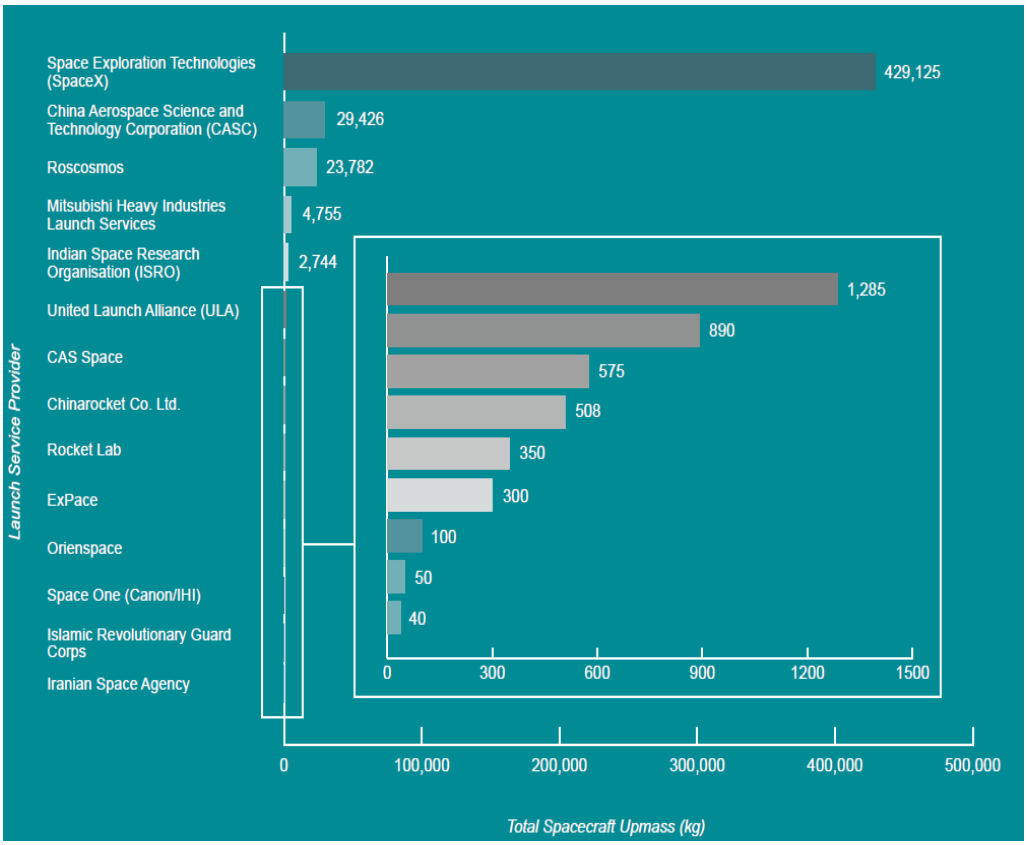


Source: Intro-Act, ByrceTech

U.S. Providers Conducted 36 Launches, While Chinese Providers Conducted 14 Launches

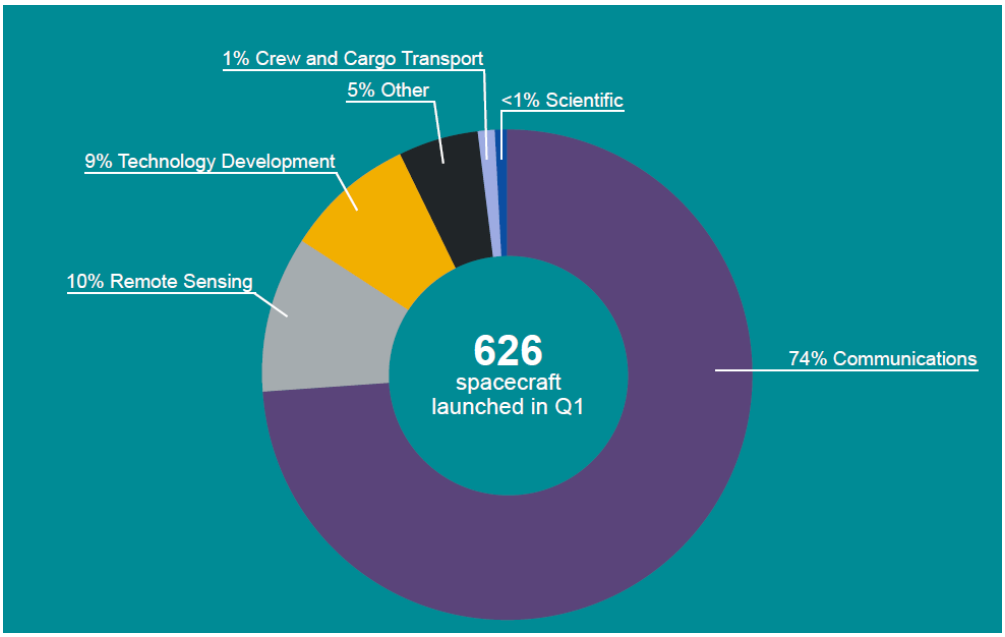
Source: Intro-Act, ByrceTech

Spacecraft Upmass Carried by Launch Provider



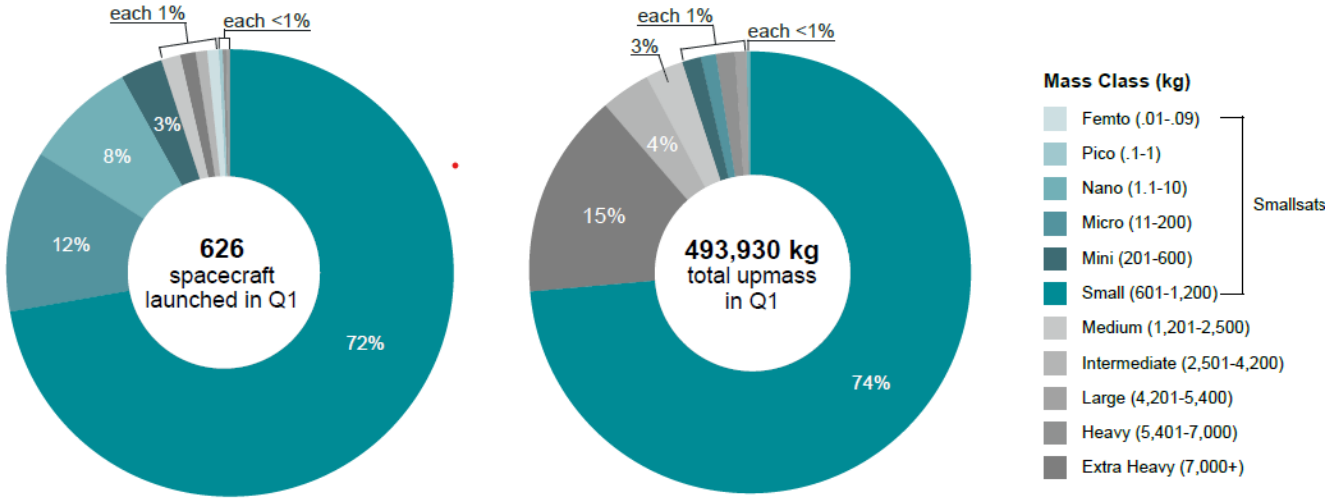
Source: Intro-Act, ByrceTech

Driven By Continued Deployment of The Starlink Constellation, Most Spacecraft Launched in Q1 were Communications Satellites



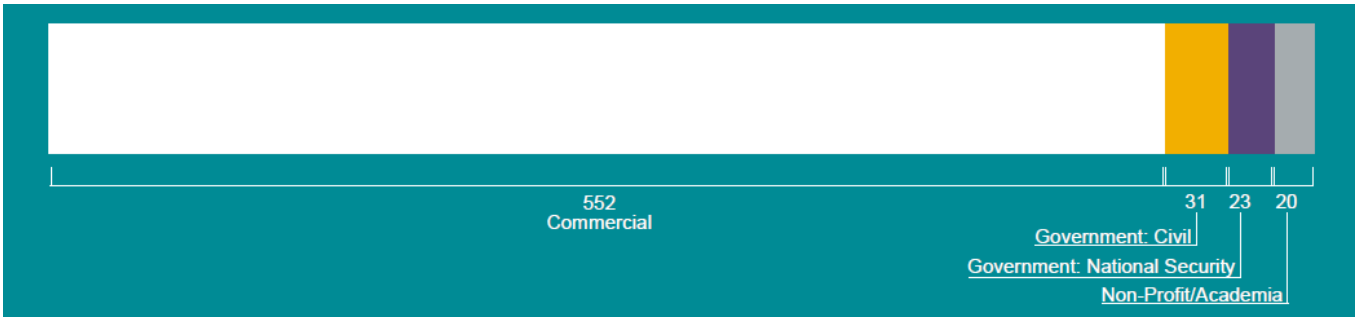
Source: Intro-act, BryceTech

Smaller Satellites (<1,200 Kg) Represented 96% Of Spacecraft Launched In Q1, 76% Of Total Upmass



Source: Intro-act, BryceTech

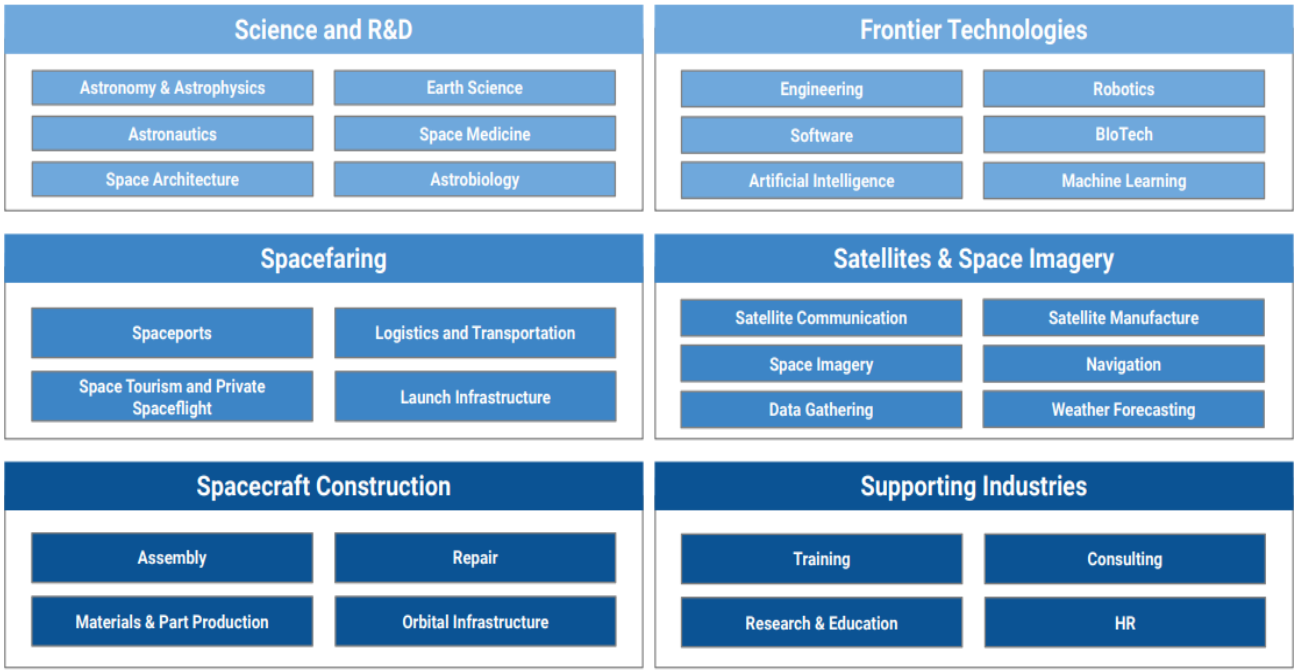
Most Spacecraft Launched in Q1 Are Operated by Commercial Companies



Source: Intro-act, BryceTech

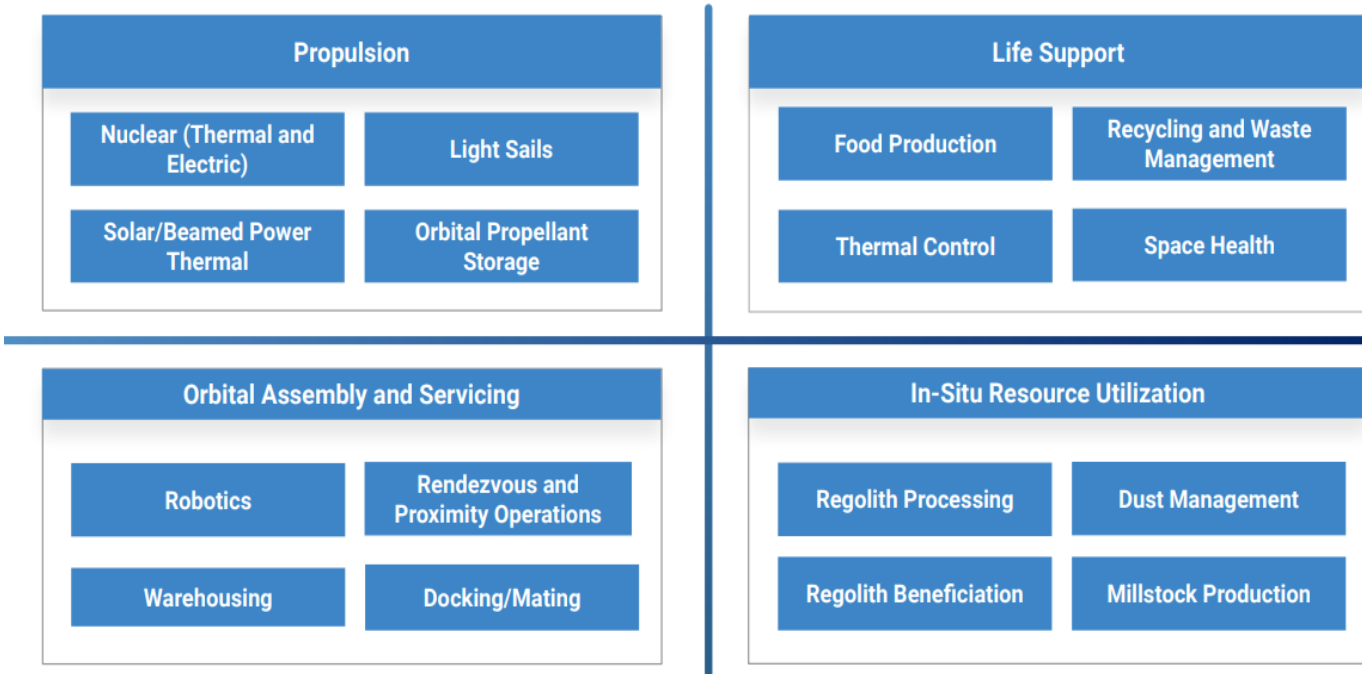
SPACETECH – ECOSYSTEMS

SpaceTech Landscape Framework



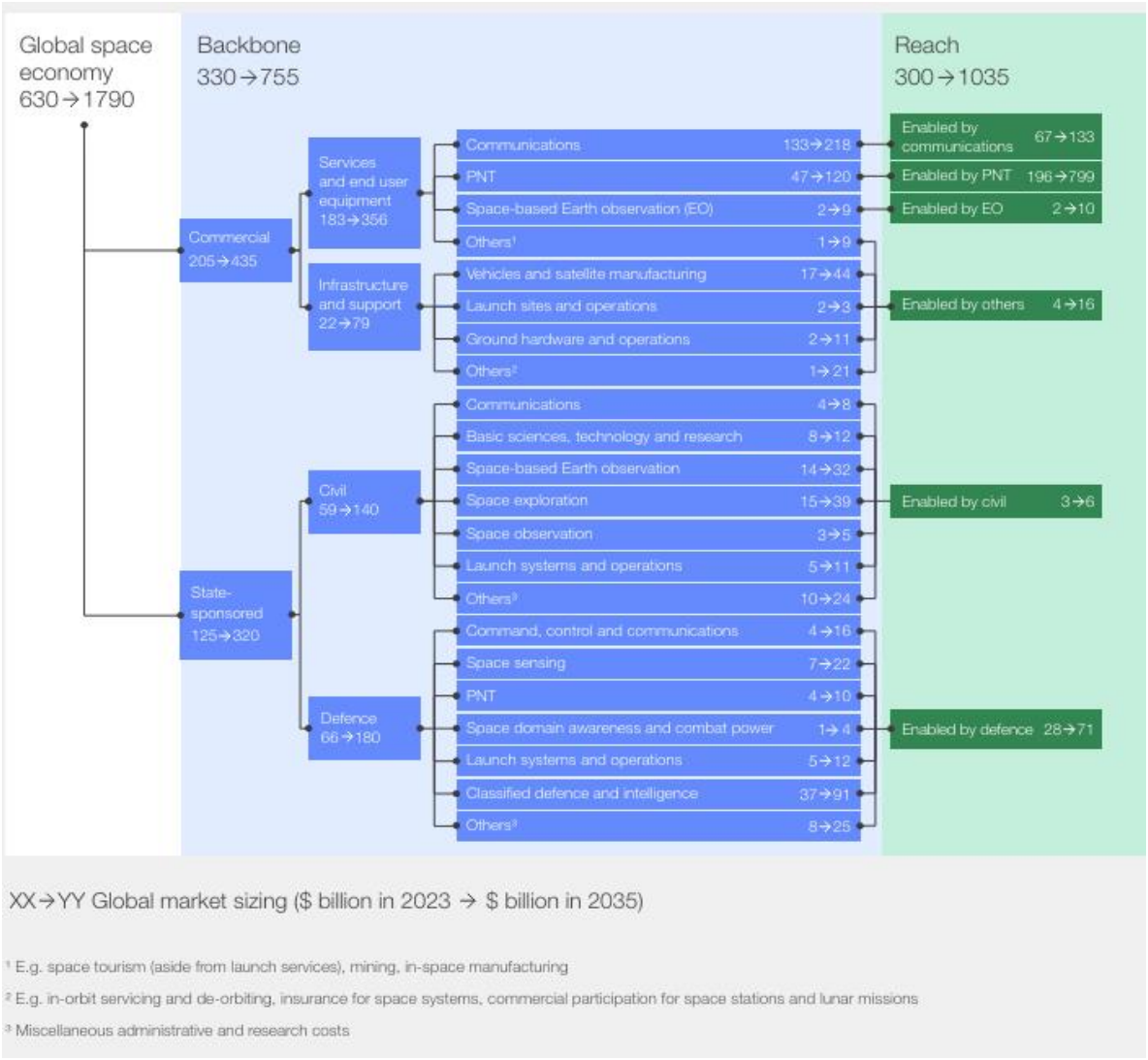
Source: Intro-act, SpaceTech Analytics

Space Applied Businesses



Source: Intro-act, SpaceTech Analytics

Global Space Economy Size ($ billion)



Source: Intro-act, Seraphim Space, Future of Space Economy Research

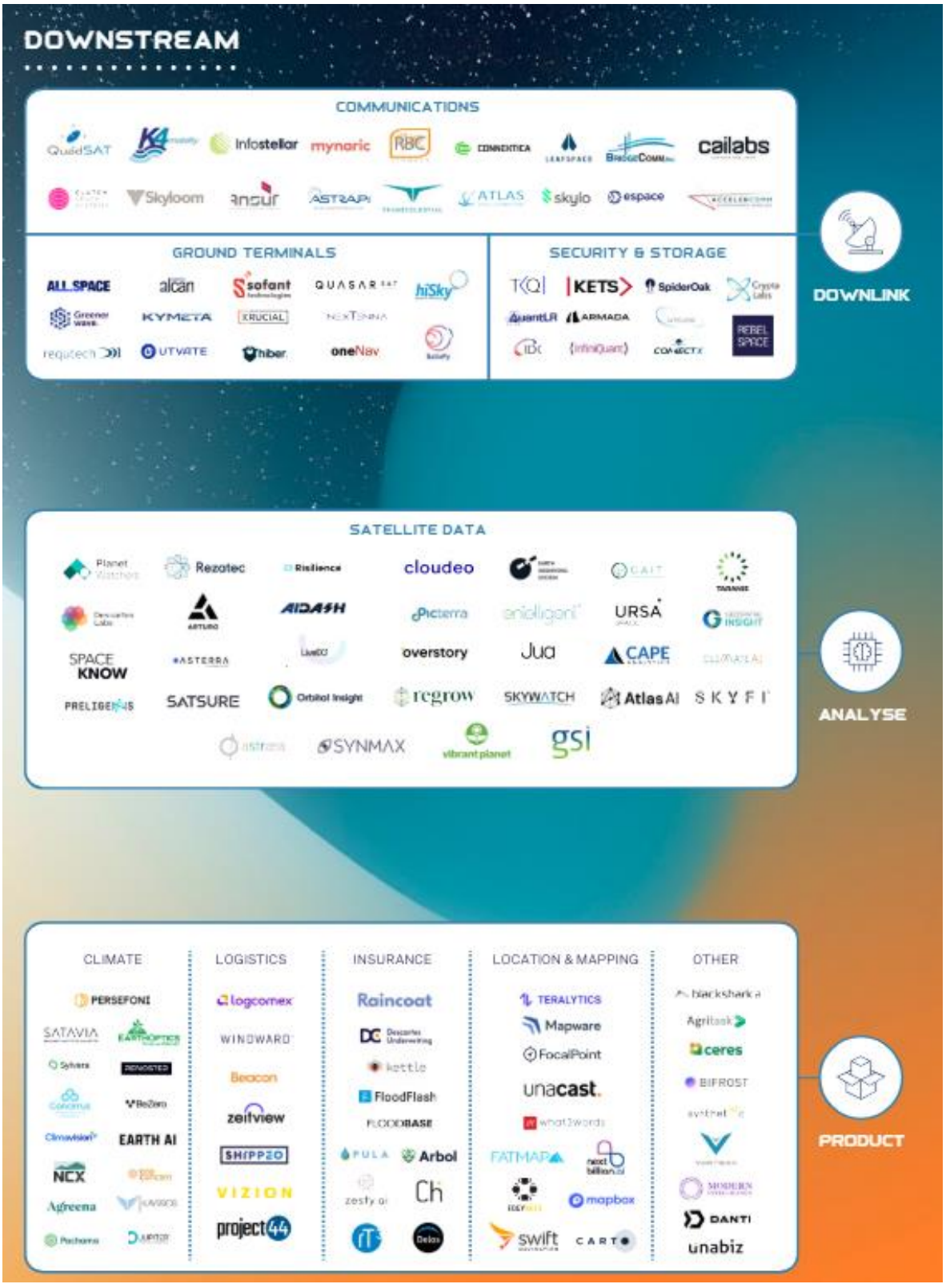
Seraphim SpaceTech Ecosystem Map 2024 - In-Space Economy

Source: Intro-act, Seraphim

Seraphim SpaceTech Ecosystem Map 2024 – Upstream Players

Source: Intro-act, Seraphim

Seraphim SpaceTech Ecosystem Map 2024 – Downstream Players



Source: Intro-act, Seraphim

SPACETECH - FUNDING

Year to Date Private Market Equity Investment

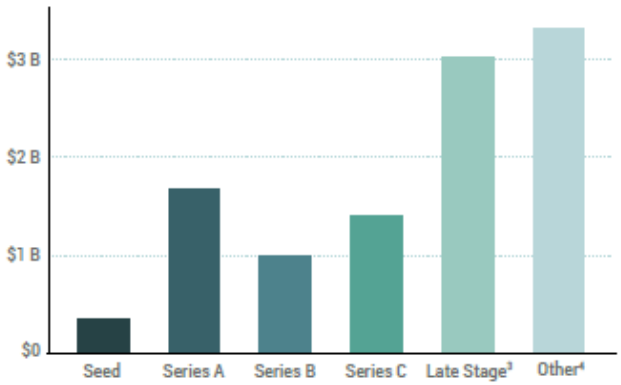
$10.7B

NUMBER OF ROUNDS **235**

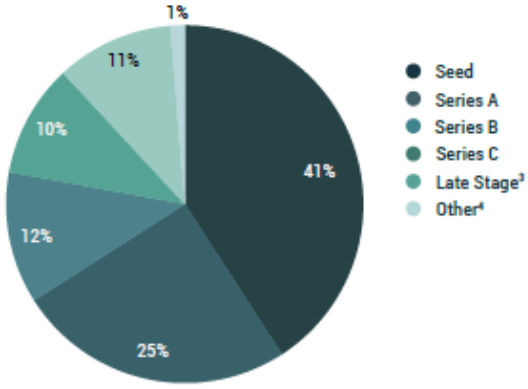
EARLY-STAGE INVESTMENT[2] **$2.0B**

EARLY-STAGE ROUNDS **155**

BY STAGE • INVESTMENT AMOUNT



BY STAGE • ROUND SHARE



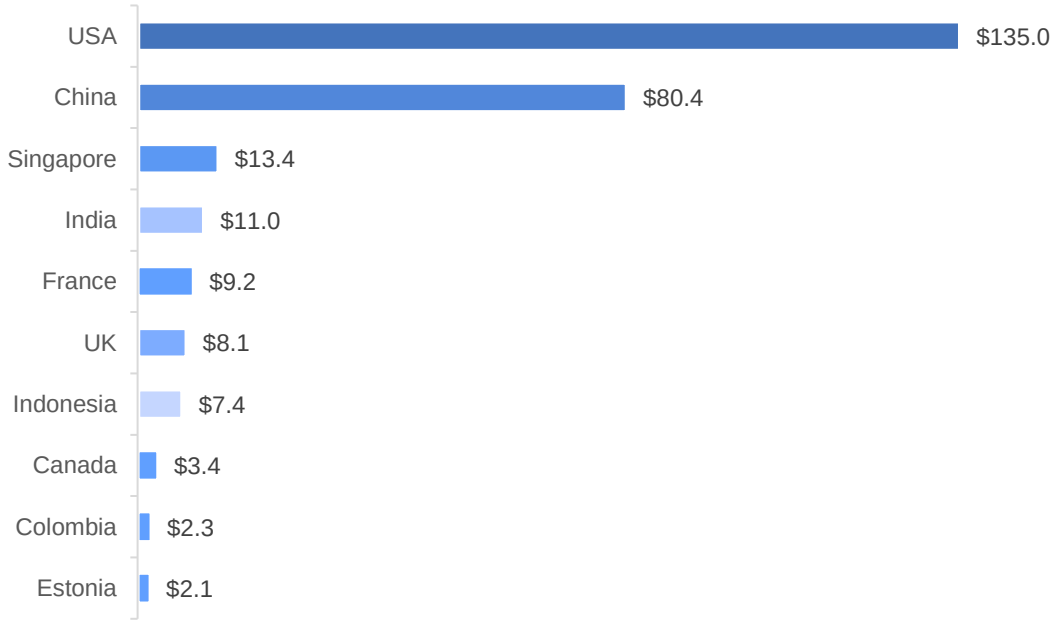
Source: Intro-act, Space Capital, Q2 2024

Top SpaceTech Investment Deals, 2Q24

Company	Stage	Amount ($ millions)
Space Pioneer	Series C	208
Mino Space	Series C	138
Aalto HAPS	Series D+	100
World View	Series D+	95.7
Apex	Series B	95
ICEyE	Series E	93
Varda	Series B	90
PLD Space	Series C	83.8
Emposat	Series C	70.7
Isar Aerospace	Series C (extension)	70

Source: Intro-act, Seraphim Space

SpaceTech Equity Investment by Geography: Leading Countries (January 2014–June 2024)



Source: Intro-act, Space Capital

SpaceTech Institutional Owners League (Current)

Rank	Investor Name	# SpaceTech Positions	Invested in SpaceTech	Q/Q Change in Volume	% of Instit Ownership
1	The Vanguard Group, Inc.	87	757,075	118,673	11.3%
2	BlackRock Fund Advisors	85	427,065	68,511	6.4%
3	SSgA Funds Management, Inc.	87	368,075	61,964	5.5%
4	Fidelity Management & Research Co. LLC	76	240,906	32,539	3.6%
5	Geode Capital Management LLC	90	181,526	29,202	2.7%
6	T. Rowe Price Associates, Inc. (Investment Management)	52	143,723	15,099	2.1%
7	Capital Research & Management Co. (World Investors)	31	123,001	22,779	1.8%
8	Norges Bank Investment Management	57	113,114	111,858	1.7%
9	Capital Research & Management Co. (Global Investors)	23	98,195	15,466	1.5%
10	Capital Research & Management Co. (International Investors)	27	90,349	15,243	1.3%
11	JPMorgan Investment Management, Inc.	68	87,864	11,290	1.3%
12	Northern Trust Investments, Inc.(Investment Management)	81	83,264	11,936	1.2%
13	Wellington Management Co. LLP	53	78,903	4,995	1.2%
14	BlackRock Advisors (UK) Ltd.	75	63,325	10,717	0.9%
15	Charles Schwab Investment Management, Inc.	81	61,939	9,748	0.9%
16	BlackRock Investment Management (UK) Ltd.	69	58,998	9,301	0.9%
17	Massachusetts Financial Services Co.	37	52,636	4,764	0.8%
18	Morgan Stanley Smith Barney LLC (Investment Management)	70	52,243	8,507	0.8%
19	Goldman Sachs Asset Management LP	75	45,855	7,062	0.7%
20	AllianceBernstein LP	77	45,498	5,729	0.7%
21	Legal & General Investment Management Ltd.	75	43,482	7,757	0.6%
22	Managed Account Advisors LLC	44	42,983	5,337	0.6%
23	Columbia Management Investment Advisers LLC	61	42,014	4,928	0.6%
24	Parametric Portfolio Associates LLC	76	39,605	5,077	0.6%
25	TIAA-CREF Investment Management LLC	64	37,220	4,816	0.6%
26	Amundi Asset Management US, Inc.	46	33,880	4,295	0.5%
27	Fisher Asset Management LLC	35	33,669	5,164	0.5%
28	The Bank of New York Mellon Corp. (Investment Management)	61	33,360	4,629	0.5%
29	Jennison Associates LLC	22	33,353	4,328	0.5%
30	Dimensional Fund Advisors LP	77	32,279	5,768	0.5%
	Other		3,155,110	487,847	47.1%
	Total		**6,700,512**	**1,115,330**	

Source: Intro-act, 13F Filings

			7/25/2024	Share Price	Mkt Cap ($ Mns)	Ent Val ($ Mns)	Price Performance			Sales			EBITDA			Book Value	
							% to High	% to Low	% YTD	LTM	NTM	EV/Sales	LTM	NTM	EV/ EBITDA	Book/ Share	P/ Book
Peer Set																	
SPACE EXPLORATION AND SATELLITE MANUFACTURING																	
1	RAYTHEON TECHNO	RTX		113.47	150,859	191,241	2%	-40%	32%	77,872	81,644	2.3 x	11,880	13,256	14.4 x	44.34	2.6 x
2	HONEYWELL INTER	HON		202.45	131,833	146,473	9%	-14%	-3%	37,334	40,999	3.6 x	9,608	10,511	13.9 x	26.09	7.8 x
3	LOCKHEED MARTIN	LMT		521.40	124,280	140,200	1%	-24%	47%	71,069	72,309	1.9 x	10,052	9,820	14.3 x	26.05	20.0 x
4	BOEING	BA		184.35	113,462	153,481	45%	-13%	-8%	76,442	82,842	1.9 x	1,399	5,182	29.6 x	(27.73)	-6.6 x
5	AIRBUS GROUP	AIR-FR		139.99	110,914	108,858	34%	-9%	10%	71,772	75,946	1.4 x	8,802	8,899	12.2 x	24.97	5.6 x
6	SYNOPSYS	SNPS		538.72	82,541	81,553	17%	-22%	46%	6,190	6,443	12.7 x	2,233	2,663	30.6 x	46.69	11.5 x
7	NORTHROP GRUM	NOC		470.57	69,640	84,014	6%	-12%	23%	40,764	41,836	2.0 x	4,126	5,701	14.7 x	97.64	4.8 x
8	DASSAULT SYSTEM	DSY-FR		36.52	48,877	46,818	45%	-3%	-37%	6,518	7,135	6.6 x	2,299	2,550	18.4 x	6.64	5.5 x
9	BAE SYSTEMS	BA-GB		16.10	48,757	51,737	12%	-27%	117%	27,963	36,053	1.4 x	3,554	4,853	10.7 x	4.41	3.6 x
10	L3HARRIS TECHN	LHX		243.27	46,144	59,463	1%	-34%	14%	20,765	21,599	2.8 x	3,970	3,901	15.2 x	99.27	2.5 x
11	AMETEK	AME		168.52	39,007	41,801	11%	-19%	15%	6,736	7,374	5.7 x	2,076	2,288	18.3 x	38.74	4.3 x
12	MITSUBISHI ELECT	6503-JP		16.36	34,571	32,615	16%	-33%	33%	35,065	34,659	0.9 x	3,564	4,039	8.1 x	11.13	1.5 x
13	THALES	HO-FR		155.18	32,620	36,674	22%	-14%	87%	18,540	21,824	1.7 x	2,778	3,390	10.8 x	38.01	4.1 x
14	KOMATSU	6301-JP		29.28	28,517	34,260	12%	-23%	29%	26,007	25,682	1.3 x	4,631	5,049	6.8 x	19.94	1.5 x
15	TELEDYNE TECHNO	TDY		415.70	19,714	22,052	8%	-15%	-5%	5,552	5,775	3.8 x	1,346	1,411	15.6 x	196.71	2.1 x
16	TERADYNE	TER		124.34	19,410	18,452	31%	-35%	-24%	2,704	3,080	6.0 x	656	773	23.9 x	16.64	7.5 x

17	BALL	BALL	62.05	19,259	23,911	15%	-31%	-36%	13,414	12,315	1.9 x	2,053	1,987	12.0 x	23.35	2.7 x
18	IDEX	IEX	203.08	15,372	16,142	21%	-10%	-14%	3,229	3,371	4.8 x	878	951	17.0 x	47.68	4.3 x
19	LEONARDO-FINMEC	LDO-IT	23.10	13,356	16,800	15%	-46%	225%	17,237	18,292	0.9 x	1,792	2,175	7.7 x	14.53	1.6 x
20	HEICO	HEI	230.76	12,654	34,561	3%	-33%	60%	3,511	4,040	8.6 x	891	1,060	32.6 x	24.48	9.4 x
21	MOOG	MOG.A	194.38	5,590	7,259	3%	-49%	140%	3,509	3,543	2.0 x	-	499	14.5 x	54.84	3.5 x
22	HEXCEL Corp	HXL	62.24	5,088	5,714	24%	-6%	20%	1,578	1,929	3.0 x	297	388	14.7 x	19.23	3.2 x
23	IHI	7013-JP	32.84	5,079	7,905	18%	-47%	67%	8,799	10,845	0.7 x	1,125	1,221	6.5 x	15.44	2.1 x
24	SPIRIT AEROSYST	SPR	35.51	4,141	7,946	2%	-59%	-18%	6,320	7,234	1.1 x	(257)	472	16.8 x	(9.61)	-3.7 x
25	OHB SWEDEN	OHB-DE	47.55	914	1,196	3%	-28%	17%	-	1,392	0.9 x	105	132	9.0 x	23.14	2.1 x
26	PROTO LABS INC	PRLB	34.41	871	766	22%	-33%	-33%	506	517	1.5 x	86	80	9.6 x	27.15	1.3 x
27	3D SYSTEMS CORP	DDD	3.99	532	590	128%	-27%	-81%	474	496	1.2 x	(37)	(1)	-	3.13	1.3 x
28	REDWIRE CORP	RDW	6.92	454	625	19%	-66%	3%	274	304	2.1 x	(7)	19	32.4 x	(0.76)	-9.1 x
29	VIRGIN GALACTIC	SPCE	6.72	138	(172)	1186%	-7%	-97%	8	4	-41.4 x	(374)	(351)	-	20.61	0.3 x
30	LATECOERE SA	LAT-FR	0.01	130	373	3976%	-37%	-94%	505	733	0.5 x	(11)	5	72.6 x	(0.01)	-0.8 x
31	MARKFORGED HOLD	MKFG	0.39	79	12	489%	-1%	-93%	90	104	0.1 x	(47)	-	-	0.64	0.6 x
32	GOMSPACE	GOMX-SE	0.48	68	71	22%	-79%	-43%	19	-	-	(22)	-	-	0.08	5.8 x
33	VELO3D INC	VLD	2.86	24	59	2739%	-5%	-99%	61	-	-	-	-	-	6.08	0.5 x
34	AAC CLYDE SPACE	AAC-SE	3.94	22	20	48%	-38%	-76%	21	43	0.5 x	(3)	3	6.5 x	11.35	0.3 x
35	SIDUS SPACE	SIDU	2.81	11	9	807%	-22%	-100%	7	-	-	-	-	-	4.10	0.7 x

36	MOMENTUS INC	MNTS	0.54	9	3	4210%	-36%	-100%	0	-	-	(76)	-	-	1.59	0.3 x
37	ASTROCAST SA	ASTRO-NO	0.02	1	31	2322%	-48%	-100%	-	-	-	-	-	-	(0.20)	-0.1 x
LAUNCHERS																
38	TE CONNECTIVITY	TEL	154.54	47,325	51,091	4%	-26%	-4%	15,812	16,417	3.1 x	3,727	3,950	12.9 x	40.70	3.8 x
39	ROCKET LAB USA INC	RKLB	5.25	2,587	2,571	43%	-34%	-57%	282	453	5.7 x	(86)	(91)	-	0.97	5.4 x
40	LILIUM GMBH	LILM	0.92	525	281	53%	-35%	-87%	0	0	-	(275)	(352)	-	0.08	11.8 x
41	AVIO SPA	AVIO-IT	13.85	365	279	5%	-46%	9%	379	414	0.7 x	28	32	8.8 x	12.75	1.1 x
42	ASTRA SPACE INC	ASTR	0.54	10	42	1081%	-9%	-99%	9	-	-	-	-	-	(1.48)	-0.4 x
DATA SERVICES																
43	HEXAGON	HEXA.B-SE	10.26	26,638	31,117	21%	-25%	-35%	5,840	6,332	4.9 x	1,961	2,326	13.4 x	4.14	2.5 x
44	UNITY SOFTWARE INC	U	16.18	6,324	7,740	191%	-6%	-89%	2,147	1,859	4.2 x	494	444	17.4 x	8.16	2.0 x
45	CLARIVATE PLC	CLVT	6.90	4,992	10,384	40%	-25%	-71%	2,621	2,624	4.0 x	1,101	1,092	9.5 x	6.73	1.0 x
46	MDA	MDA-CA	9.56	1,148	1,532	19%	-37%	27%	598	784	2.0 x	123	154	9.9 x	6.70	1.4 x
47	PLANET LABS	PL	2.39	644	434	58%	-30%	-61%	228	264	1.6 x	(45)	(15)	-	1.72	1.4 x
48	BEIJING PIESAT	688066-CN	1.89	493	779	406%	-6%	-77%	357	371	2.1 x	62	57	13.6 x	1.13	1.7 x
49	WEATHERNEWS INC	4825-JP	36.77	435	328	23%	-24%	-53%	148	153	2.1 x	-	-	-	11.13	3.3 x
50	SATREC INITIATIVE	099320-KR	35.04	384	332	21%	-47%	-9%	-	132	2.5 x	-	14	24.2 x	14.18	2.5 x
51	SPIRE GLOBAL	SPIR	13.85	337	404	40%	-76%	-49%	107	135	3.0 x	(5)	17	23.4 x	3.51	3.9 x
52	IMAGESAT INT	ISI-IL	3.27	200	203	24%	-33%	-	-	70	2.9 x	-	24	8.5 x	2.60	1.3 x

53	BLACKSKY TECH	BKSY	1.11	165	217	81%	-23%	-75%	100	114	1.9 x	5	15	14.3 x	0.57	2.0 x
54	TERRAN ORBITAL	LLAP	0.71	145	310	128%	-13%	-93%	94	268	1.2 x	(71)	(25)	-	(1.03)	-0.7 x
55	WINDWARD	WNWD-GB	1.33	118	99	19%	-64%	-54%	22	36	2.7 x	(12)	(1)	-	0.07	20.0 x
56	SATELLOGIC	SATL	1.13	87	82	123%	-39%	-88%	6	-	-	-	-	-	0.57	2.0 x
57	ARQIT QUANTUM INC	ARQQ	0.37	62	48	306%	-19%	-98%	20	3	17.0 x	(40)	(28)	-	0.09	4.0 x
COMMUNICATIONS EQUIPMENT																
58	SAFRAN S.A.	SAF-FR	216.57	92,531	90,002	10%	-31%	83%	20,298	29,498	3.1 x	3,628	5,741	15.7 x	30.00	7.2 x
59	AMPHENOL CORP.	APH	61.76	74,187	76,776	15%	-36%	41%	13,393	15,426	5.0 x	3,250	3,721	20.6 x	7.46	8.3 x
60	MEDIATEK	2454-TW	38.83	62,097	57,753	20%	-46%	-9%	14,757	15,839	3.6 x	3,274	3,479	16.6 x	7.14	5.4 x
61	GARMIN LTD	GRMN	173.40	33,306	31,216	3%	-43%	27%	5,462	-	-	1,374	-	-	37.72	4.6 x
62	VERTIV	VRT	76.48	28,630	31,543	43%	-67%	206%	7,205	8,199	3.8 x	1,351	1,777	17.7 x	4.10	18.7 x
63	TRIMBLE INC	TRMB	54.70	13,358	16,374	20%	-28%	-37%	3,837	3,606	4.5 x	1,014	973	16.8 x	18.26	3.0 x
64	ELBIT SYS	ESLT	186.65	8,302	9,713	21%	-6%	7%	6,135	6,556	1.5 x	544	637	15.3 x	67.65	2.8 x
65	KRATOS DEFENSE	KTOS	22.25	3,340	3,300	3%	-37%	15%	1,083	1,182	2.8 x	104	112	29.6 x	8.71	2.6 x
66	ECHOSTAR CORP	SATS	19.66	2,756	30,031	26%	-52%	-25%	9,041	15,685	1.9 x	390	1,645	18.3 x	72.84	0.3 x
67	VALEO SA	FR-FR	10.36	2,533	7,481	133%	-4%	-66%	23,714	24,083	0.3 x	2,531	2,994	2.5 x	15.71	0.7 x
68	TOMTOM NV	TOM2-NL	5.56	736	429	60%	-5%	-42%	618	630	0.7 x	23	25	17.2 x	1.25	4.4 x
69	MYNARIC AG	MYNA	4.02	100	171	89%	-25%	-68%	6	61	2.8 x	(72)	(30)	-	(2.18)	-1.8 x
70	AMPLITECH GROUP	AMPG	1.18	11	13	117%	-15%	-70%	14	22	0.6 x	(2)	3	4.7 x	2.28	0.5 x

COMMUNICATIONS SERVICES															
71	COMCAST CORP NEW	CMCSA	38.24	147,723	246,332	24%	-5%	-24%	121,114	123,488	2.0 x	37,475	38,197	6.4 x	21.44	1.8 x
72	AT&T INC	T	19.19	137,597	300,120	3%	-28%	-22%	122,197	123,664	2.4 x	44,023	45,379	6.6 x	14.69	1.3 x
73	SIRIUS XM	SIRI	3.92	15,079	24,586	47%	-38%	-38%	8,970	8,763	2.8 x	2,814	2,703	9.1 x	(0.62)	-6.4 x
74	IRIDIUM COMM	IRDM	27.80	3,291	4,725	96%	-13%	-33%	797	818	5.8 x	464	477	9.9 x	6.64	4.2 x
75	AST SPACEMOBILE INC	ASTS	16.64	2,518	2,382	17%	-88%	110%	1	49	48.7 x	(132)	(99)	-	1.19	14.0 x
76	EUTELSAT COMM	ETL-FR	5.30	2,517	5,397	31%	-31%	-57%	1,253	1,324	4.1 x	877	718	7.5 x	9.15	0.6 x
77	VIASAT INC	VSAT	18.88	2,376	8,161	69%	-38%	-58%	4,284	4,502	1.8 x	1,440	1,540	5.3 x	39.93	0.5 x
78	GLOBALSTAR INC	GSAT	1.23	2,337	2,685	73%	-18%	6%	222	236	11.4 x	114	121	22.2 x	0.20	6.1 x
79	SES SA	SESG-FR	5.34	2,048	4,042	42%	-17%	-29%	2,192	2,149	1.9 x	1,113	1,075	3.8 x	9.11	0.6 x
80	SKY PERFECT JSAT H	9412-JP	5.49	1,633	1,257	33%	-26%	58%	815	805	1.6 x	313	294	4.3 x	5.93	0.9 x
81	GILAT SATELLITE	GILT	4.69	267	174	53%	-8%	-34%	283	314	0.6 x	25	44	4.0 x	4.93	1.0 x
82	TELESAT CORP	TSAT	8.04	108	2,533	183%	-14%	-72%	-	411	6.2 x	-	262	9.7 x	36.55	0.2 x
SEMICONDUCTORS															
83	NVIDIA CORP	NVDA	112.28	2,762,088	2,740,764	25%	-65%	282%	79,774	130,961	20.9 x	52,895	86,553	31.7 x	2.00	56.2 x
84	BROADCOM INC.	AVGO	149.26	694,788	758,266	24%	-47%	124%	42,619	56,358	13.5 x	26,434	35,096	21.6 x	15.05	9.9 x
85	QUALCOM	QCOM	175.39	195,735	197,692	31%	-41%	-4%	36,415	40,014	4.9 x	13,459	15,115	13.1 x	21.89	8.0 x
86	TEXAS INSTR	TXN	197.15	180,007	183,794	7%	-29%	5%	16,092	16,797	10.9 x	7,206	7,632	24.1 x	18.85	10.5 x
87	MICROCHIP TECH	MCHP	85.03	45,619	51,474	18%	-19%	-2%	7,634	5,473	9.4 x	3,590	2,109	24.4 x	12.41	6.9 x

88	INFINEON TECH	IFX-DE	33.09	43,210	48,224	34%	-14%	-28%	16,870	17,019	2.8 x	5,631	5,122	9.4 x	13.20	2.5 x
SOFTWARE																
89	AUTODESK	ADSK	242.23	52,203	52,704	15%	-21%	-14%	5,645	6,199	8.5 x	2,072	2,327	22.6 x	10.05	24.1 x
90	VERISK	VRSK	275.90	39,364	42,143	2%	-22%	21%	2,734	2,933	14.4 x	1,474	1,610	26.2 x	1.98	139.6 x
91	ANSYS INC	ANSS	310.69	27,123	26,923	17%	-17%	-23%	2,227	2,494	10.8 x	757	1,123	24.0 x	61.97	5.0 x
92	TOPICUS	TOI-CA	89.81	7,444	7,788	6%	-32%	-2%	-	1,444	5.4 x	-	411	19.0 x	3.02	29.7 x
93	UIPATH INC	PATH	12.20	5,982	5,120	128%	-9%	-72%	1,354	1,438	3.6 x	254	153	33.6 x	3.54	3.4 x
94	ENGHOUSE SYS	ENGH-CA	21.85	1,209	1,026	31%	-9%	-43%	354	386	2.7 x	104	112	9.2 x	7.56	2.9 x
DRONES/UAVs																
95	AEROVIRONMENT	AVAV	169.94	4,781	4,768	32%	-46%	174%	717	815	5.8 x	128	155	30.8 x	29.24	5.8 x
96	JOBY AV	JOBY	6.18	4,378	3,465	45%	-27%	-15%	0	4	830.0 x	(299)	(418)	-	1.38	4.5 x
97	ARCHER AVI	ACHR	4.40	1,332	1,029	70%	-32%	-27%	0	8	122.2 x	(313)	(351)	-	1.19	3.7 x
98	BLADE AIR MOB	BLDE	3.56	275	148	22%	-42%	-60%	231	-	-	(13)	3	44.8 x	3.07	1.2 x
DIVERSIFIED																
99	MICROSOFT	MSFT	418.40	3,109,677	3,136,175	12%	-26%	24%	236,584	269,272	11.6 x	126,987	146,802	21.4 x	34.06	12.3 x
100	AMAZON.COM INC	AMZN	179.85	1,871,632	1,939,167	12%	-34%	8%	590,740	652,087	3.0 x	120,771	142,431	13.6 x	20.83	8.6 x
101	ALPHABET	GOOGL	167.28	982,603	1,981,510	15%	-28%	16%	328,284	364,524	5.4 x	135,564	157,651	12.6 x	24.41	6.9 x
102	ORACLE	ORCL	137.82	379,813	458,329	6%	-28%	58%	52,961	57,890	7.9 x	28,817	30,848	14.9 x	3.16	43.6 x
103	TRANSDIGM GR	TDG	1,228.42	68,741	86,344	11%	-35%	93%	7,304	8,372	10.3 x	3,811	4,371	19.8 x	(54.15)	-22.7 x

104	CONSTELLATION SOFT	CSU-CA	3,149.81	66,749	69,334	3%	-39%	70%	8,841	10,611	6.5 x	2,350	2,844	24.4 x	107.90	29.2 x
105	KONGSBERG GRUP	KOG-NO	95.29	16,763	16,674	7%	-58%	193%	4,140	4,580	3.6 x	638	726	23.0 x	8.43	11.3 x
106	NANO DIMEN	NNDM	2.29	501	(242)	47%	-10%	-44%	-	-	-	-	-	-	3.95	0.6 x
SPACS																
107	EVE HOLDING INC	EVEX	3.34	900	801	189%	-6%	-67%	0	0	2,337.5 x	(133)	(147)	-	0.52	6.4 x
108	INTUITIVE MACHINES	LUNR	4.33	233	658	206%	-52%	-55%	89	228	2.9 x	(10)	(14)	-	(9.63)	-0.4 x
109	DHC ACQUISITION	DHCA	2.66	95	87	642%	-63%	-73%	-	0	-	-	(21)	-	0.61	4.3 x
110	SATIXFY	SATX	0.69	58	111	17%	-60%	-93%	-	-	-	-	-	-	(0.86)	-0.8 x
111	BROAD CAPITAL	BRAC	11.47	34	58	7%	-6%	-	-	-	-	-	-	-	1.77	6.5 x
112	GIGCAPITAL5	GIA	0.64	14	18	2172%	-6%	-84%	-	-	-	-	-	-	(0.23)	-2.8 x

Data updated as of 07/25/2024.

**Companies for which quarterly NTM and LTM data is not available, yearly numbers are used.*

IMPORTANT DISCLOSURES

Analyst Certification: As document curator, I (Frank White) certify that the views expressed in this research, conducted by Intro-act analysts, accurately reflect my personal understanding of the subject securities or issues. I do not receive direct or indirect compensation based on my recommendations or views. I may hold stock in companies mentioned in our reports, and it is my intention that most of the revenue from these holdings will go to charity. It is also my intention to fly on multiple space carriers and our publications may mention one or more of these companies. Intro-act, Inc. (Intro-act) compiled and issued this report and may seek fees for the assistance with investor targeting, access, and further investor preparation services.

Accuracy of content: All information used in the publication of this report has been compiled from publicly available sources that are believed to be reliable. However, the issuer and related parties, as well as Intro-act, do not guarantee the accuracy or completeness of this report, and have not sought for this information to be independently verified. Opinions contained in this report represent those of the Intro-act analysts at the time of publication. Forward-looking information or statements in this report contain information that is based on assumptions, forecasts of future results, and estimates of amounts not yet determinable, and therefore involve known and unknown risks, uncertainties, and other factors that may cause the actual results, performance, or achievements of their subject matter to be materially different from current expectations.

Use of AI: A range of AI capabilities have been used in this report, including publicly available models like ChatGPT, but always with human management and review, and much of the text content in this publication is AI-generated. In addition, Intro-act Inc. employs its own proprietary AI system (the "System"), which is operated by a team of AI professionals, for its research purposes. The AI responses from the System so generated are not mere mechanical reproductions and require a high-level of creative input or intervention from the human "author." The System does not operate automatically and is dependent on the human "author" for its end-to-end functioning, with the human intervention including designing the system architecture, feeding the System resources for its responses and crafting well-designed and accurate prompts. Thus, even though much of the content was generated using AI, AI is not the "author" of the publication and the "authorship" of the publication lies with a human, in the legal sense of the terms, as outlined in the US Copyright Office's Compendium of Copyright Office Practices, as such, this publication is the result of the human author's own original mental conception and the publication as a whole constitutes an original work of human authorship.

Exclusion of Liability: To the fullest extent allowed by law, Intro-act, Inc. shall not be liable for any direct, indirect, or consequential losses, loss of profits, damages, or costs or expenses incurred or suffered by you arising out or in connection with the access to, use of, or reliance on any information contained in this note.

No personalized advice: The information that we provide should not be construed in any manner whatsoever as personalized advice. Also, the information provided by us should not be construed by any subscriber or prospective subscriber as Intro-act's solicitation to affect, or attempt to affect, any transaction in a security. The securities described in the report may not be eligible forle in all jurisdictions or to certain categories of investors.

Investment in securities mentioned: Intro-act has a restrictive policy relating to personal dealing and conflicts of interest. Intro-act, Inc. does not conduct any investment business and, accordingly, does not itself hold any positions in the securities mentioned in this report. However, the respective directors, officers, employees, and contractors of Intro-act may have a position in any or related securities mentioned in this report, subject to Intro-act's policies on personal dealing and conflicts of interest.

Intro-act is not registered as an investment adviser with the Securities and Exchange Commission. Intro-act relies upon the "publishers' exclusion" from the definition of investment adviser under Section 202(a) (11) of the Investment Advisers Act of 1940 and corresponding state securities laws. This report is a bona fide publication of general and regular circulation offering impersonal investment-related advice, not tailored to a specific investment portfolio or the needs of current and/or prospective subscribers. As such, Intro-act does not offer or provide personal advice, and the research provided is for informational purposes only. No mention of a particular security in this report constitutes a recommendation to buy, sell, or hold that or any security, or that any particular security, portfolio of securities, transaction, or investment strategy is suitable for any specific person.