ESPI

European Space Policy Institute

ESPI Insights

Space Sector Watch

Issue 19
August 2021

THIS MONTH IN THE SPACE SECTOR...

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SOUTH KOREA RAISES ITS AMBITIONS IN SPACE

Dear Friends of ESPI,

South Korea has made the headlines multiple times in the past few months for its space-related developments. In 2021 alone, the country revealed its intention to land on the Moon by 2030 in March, signed the Artemis accords in May and announced the creation of a think tank focusing on space issues in July. More recently, the military space sector also enjoyed its share of announcements as the Defence Acquisition Program Administration disclosed its ambitions in this domain on August 19th.

The country plans to invest ₩16 trillion (€11.7 billion) over ten years to improve its defence capabilities in space. 10% of this amount will be dedicated to the development of "core technologies" for military satellites to enhance South Korea's autonomy in developing spacecraft domestically. A whole set of measures is also going to be implemented to favour the establishment of an ecosystem for private actors, including technology transfers from public agencies to industry. Planification will also be improved, with the preparation of a comprehensive plan for space defence, called the Space Defence Project Master Plan. This initiative follows the update and revision of South Korea's Basic Plan for the Promotion of Space Development and Basic Plan for the Development of Space Defence Power, which occurred a few years ago and already underlined the rising interest of South Korea in military space. Finally, South Korea also aims to further develop international cooperation. For instance, the Air Force's chief, Gen. Park In-ho, visited the United States at the end of August. He met Gen. John Raymond, Chief of Space Operations, and Gen. James Dickinson, Commander of the USSPACECOM, and signed an agreement on bilateral military space collaboration, in both policy and operational areas.

These plans follow two major recent developments for South Korea's relationship to access to space. First, in July 2020, the country was granted the authorisation to research and develop solid propellant rockets, forbidden until then for non-proliferation purposes. Second, a restriction that prevented the country to develop and possess ballistic missiles with a range of more than 800km was lifted in May 2021. The lifting of these restrictions broadens the possibilities for South Korea and opens the possibility for the country to launch its own military satellites in the future, especially for reconnaissance purposes.

Ballistic missile developments in North Korea as well as the quick progress of other Asian states' military space sectors, in particular in China (e.g. the PRC already launched 24 military satellites in 2021), also creates a new strategic context for South Korea, raising stakes in the domain of space defence.

Overall, the South Korean decision reminds us that renewed interest in the security and defence sectors is bound to become a key driver for the expansion of space activities, in particular when it comes to the development of autonomous capabilities. European states, as well as the European Union, seem to have already understood this global trend, as demonstrated by the various organisational changes that took place in European militaries in the past years as well as the efforts deployed to further synergies between space and defence at the European Commission level. Reconsidering cooperation in the military space realm with countries outside of the continent, including emerging spacefaring nations, is certainly an additional dimension that would deserve full considerations.

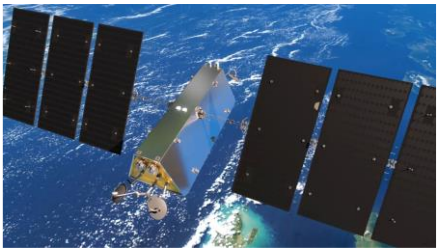
Yours sincerely,

Jean-Jacques Tortora

Director of ESPI

POLICY & PROGRAMMES

Telesat Lightspeed constellation receives CAD 1.5 billion in new governmental funding



Credit: Telesat

On August 12th, the Government on Canada committed to fund the development of Telesat's Lightspeed constellation with an additional CAD 1.44 billion. As per the terms of the agreement, the funding will be composed of a CAD 790 million loan and CAD 650 million in preferred equity. In exchange, Telesat has committed to invest CAD 1 billion in capital expenditure for the constellation and to increase its number of employees in Canada. The company also pledged to invest either CAD 2.6 billion or 50% of "certain capital expenditures" for the second generation of the constellation. The Government of Ontario also invested CAD 109 million to support Telesat Lightspeed against an investment of Telesat of CAD 20 million for the expansion of its Ontario facilities and an increase of its staff in the province.

With the new funding, Telesat has now secured approx. CAD 4 billion for the Lightspeed constellation. This represents more than two thirds of the full cost for the project, as the company expects to raise the remaining funds through BPI France and the Canadian export credit agency, Export Development Canada. In addition, Telesat will officially merge with public company Loral Space and Communication and start listing on the Nasdaq stock exchange in its place following a vote held by Loral's shareholders on August 23rd. The merger will allow Telesat to access public equity markets and was one of the conditions set by Canada for its debt and equity investment.

EUMETSAT launches first pilot programme to acquire commercial satellite data

The governing council of EUMETSAT approved the acquisition of commercial satellite data from Spire Global following the launch of a new pilot programme. Specifically, EUMETSAT will obtain radio occultation data collected through Spire's more than 100 satellite-large constellation, as the agency seeks to increase the accuracy of its weather forecasts. The agency's governing council authorized the acquisition of the data for a maximum value of €9 million over the next three years. The pilot programme represents a first for the agency, as it aims to better assess the possible opportunities available from the acquisition of services provided by the nascent New Space industry. EUMETSAT will obtain data in near real-time through a global license that will enable the agency to share the acquired data to third parties.

ESA adopts new resolution on future launcher support policy

ESA's ruling council recently adopted a resolution outlining the future of the agency's launcher support policy ahead of the next Ministerial Conference scheduled to take place in late 2022. Inter alia, the resolution defines minimum institutional demand for Ariane 6 and Vega C launchers and formally opens the door to the participation of non-ESA developed launchers. Specifically, the document sets a minimum institutional demand of 4 and 2 yearly launches guaranteed for Ariane 6 and Vega C respectively. If the minimum institutional launch demand is not met within a given year following the 17th flight of Ariane 6, the resolution provides for the allocation of €140 million from States participating in the development of launch vehicle to industrial contractors. A similar provision was set for Vega C for all launches following its 6th flight. In addition, the resolution provides for the emission of an ESA and EU sponsored "flight ticket" for payloads having a mass bellow 200kg that could be launched by vehicles with proven flight-capability that were not developed by the agency. Following its adoption, the resolution awaits formal approval at the 2022 Ministerial Council.

NASA pauses work on SpaceX HLS award following Blue Origin Court of Federal Claims suit

NASA has decided to temporarily pause its work on the Human Landing System (HLS) award with SpaceX until November following a suit filed by Blue Origin with the U.S. Court of Federal Claims. The decision to have a Voluntary Stay of Performance was taken in exchange of an agreement between all parties involved to conduct the litigation with an expedited schedule. The agency had previously paused the HLS Option A funding award to SpaceX in May due to protests filed by Blue Origin and Dynetics to the Government Accountability Office (GAO). The GAO formally dismissed the protests made by the two companies in July and released a detailed decision on August 10th clarifying its conclusion, notably highlighting the financial constraints with which NASA was confronted when attributing the award.

36th Space Symposium takes place in Colorado Springs

The 36th Space Symposium took place in Colorado Springs from August 23rd to Augusts 26th following a postponement due to the global pandemic in 2020. The conference, which was originally scheduled to begin in March of last year, attracted over 7000 participants from 25 countries and included more than 15 leaders of national space agencies. Among them, new ESA director general Josef Aschbacher and NASA administrator Bill Nelson attended their first Space Symposium since taking office. Attendees addressed a broad range of topics as the event showcased civil, commercial and military space activities.

Notable developments were reported in the field of governance, in particular in the United States with statements from the National Reconnaissance Office (NRO) and the Department of the Air Force. Both agencies have reported additional work on the reorganisation of space governance in the country, with the NRO having recently signed a document with the U.S. Space Force and the U.S. Space Command clearly defining the responsibilities of each organization. The Air Force also launched a reorganization of the offices responsible for Space Force acquisition programmes. ESA Director General Josef Aschbacher on the other hand highlighted the agency's recent efforts aimed at hosting a European Space Summit next year as well as its work on new European flagships. More details on ESA's ambition and objectives moving towards the European Space Summit are available in the ESPI Executive Brief 52.

A broad range of industry members also attended the event and highlighted their recent activities. Notably, SpaceX addressed the recent hiatus in Starlink satellite launches by mentioning both a shortage in liquid oxygen and the integration of laser terminals on future satellites as the main factors. In addition, Astroscale also reported having completed their first technology demonstration with its ELSA-d spacecraft. More information of the activities of the 36th Space Symposium are available on Space News' daily coverage of the conference.

Boeing's Starliner second launch faces further delays following latest scrub

Credit: Boeing

Boeing scrubbed the second launch of its Starliner crew capsule on August 3rd following the discovery of technical issues with the valves of the capsule's propulsion system. In order to address the problem, the company decided to postpone the launch of the spacecraft and rolled back the Atlas V rocket to its Vertical Integration Facility. However, due to complications with opening the valves, Boeing was only able to repair nine of the thirteen valves on the launch pad and was forced to return the Starliner to the factory. The decision is expected to constrain Boeing to postpone the launch of the OFT-2 for up to a few months, as ULA is scheduled to carry out the launch NASA's Lucy asteroid mission in October before SpaceX undertakes the launch of its Crew-3 mission.

In other news

Amazon Web Services (AWS) and Greece government conclude agreement: AWS signed a Statement of Strategic Intent with the Ministry of Digital Government and the Ministry of Development and Investment of Greece. The ensuing cooperation will have the objective of supporting the creation of a regional space hub in Greece, as part of the country's digital transformation goals.

U.S. Space Force (USSF) awards $32 million in contracts to 19 companies: The USSF awarded the contracts as part of the DoD's Phase II Small Business Innovation research (SBIR) programme. The award was made at the Space Force Pitch Day Event, in which the USSF also formally established the SpaceWERX, which became the agency's innovation arm as part of the AFWERX.

Canada approves NorthStar's SSA and Earth Intelligence constellation: The country's Innovation, Science and Economic Development Canada (ISED) department approved the company's spectrum application for its projected 52-satellite constellation. NorthStar's constellation will be composed of a combination of 40 Earth Observation satellites and 12 satellites equipped with optical sensors for SSA.

Virgin Orbit receives positive Final Environmental Assessment from the FAA: The approval represents a major milestone for Virgin Orbit, as the company looks to receive an FAA launch licence to begin launch operations from the Andersen Air Force Base in Guam. Virgin Orbit plans to carry out 25 launches from the base in the next five years using its LauncheOne system.

NASA awards $500 000 to 13 companies as part of its Break the Ice Lunar Challenge: Each of the companies will receive a share of the prize for completing Phase 1 of the Challenge. The objective of the Break the Ice Lunar Challenge is that of finding appropriate system architecture for the collection and transportation of lunar regolith from the Moon's South pole.

U.S. Centre for the Advancement of Science in Space (CASIS) selects SpaceLink for demonstration: The CASIS selected U.S. start-up SpaceLink for a funded demonstration of its optical terminal solution for the ISS. SpaceLink's projected relay network is designed to replace and enhance the functionalities of the NASA Tracking and Data Relay Satellite System (TDRSS).

Space Development Agency (SDA) launches request for proposals to buy 144 satellites: The request is for the acquisition of satellites that will make up the agency's Transport Layer Tranche 1, which is scheduled to start launching starting in 2024. The proposals are due in October and the Agency expects to award contracts to multiple vendors starting in January 2022.

New Zealand and LeoLabs conclude multi-year agreement: The agreement covers the development of a Regulatory and Space Sustainability Platform which will make use of LeoLabs' global radar network to monitor satellites in LEO. The agreement is part of the broader Innovative Partnership programme brokered between the Ministry of Business, Innovation and Employment and LeoLabs in 2019.

The Space and Missile Systems Center officially redesignated as Space Systems Command (SSC): The U.S. Space Force officially re-branded the Centre, which has been in operation in Los Angeles under different names since 1954. Following the redesignation, the new command is set to increasingly shift its focus from the provision of services to warfighting, with the SSC now being responsible for the research, development, and acquisition of military space related assets.

INDUSTRY & INNOVATION

Thales Alenia Space signs first EUSPA contract to provide new EGNOS capabilities

On August 25th, Thales Alenia Space and the EU Agency for Space Programme (EUSPA) signed an agreement for the development of added capabilities for Europe's EGNOS satellite navigation system. In the framework of the agreement, Thales Alenia Space will provide a new version of the EGNOS satellite navigation system for Europe. Specifically, the company will develop a version that will introduce a new generation uplink station called the Navigation Land Earth Station (NLES).

The NLES will allow the introduction of new GEO satellites in EGNOS that will enhance the redundancy of the satellite navigation system. In addition, the NLES is also expected to be compatible with the emission of Dual Frequency & Multi-Constellation messages in the future.

Astra signs multiple launch contracts following SPAC merger but fails launch attempt

Credit: Astra

U.S. launcher company Astra signed multiple launch contracts in August, notably with the U.S. DoD and Spire Global, as it prepares to carry out three commercial orbital launches within the end of the year. The first of the three was contracted by the U.S. Space Force (USSF) to launch a payload for the Space Test Program from the company's Kodiak Spaceport in Alaska but resulted in a further setback as the Rocket 3 vehicle failed to reach orbit. The agreement signed with the USSF includes a second launch to be carried out by the end of the year. The company also sealed an agreement with Spire Global for the launch of its satellites starting in 2022, although the details of the contract have not been disclosed.

In addition, the USSF has added Astra to a pool of launch providers that will be eligible to compete for contract awards under the agency's Orbital Services Program-4 (OSP-4). The company recently completed its SPAC merger with Holicity last July and now holds approx. $452 million in cash on its balance sheet. The company aims to use the funds to increase the size of its launcher and to complete the acquisition of the satellite propulsion system start-up Apollo Fusion, although the company's latest SEC filing also indicated the objective of operating its own commercial spaceport by 2022.

Hanwha Systems invests $300 million in OneWeb

On August 12th, South Korean company Hanwha System invested $300 million in OneWeb. The company has acquired an 8.8% stake in OneWeb through its investment, thus turning it into the fifth largest shareholder behind Bharti Global, Eutelsat, Softbank, and the UK Government. The transaction is expected to be finalized in 2022 and values the company at $3.41 billion. It additionally brings the total funds raised by OneWeb to $2.7 billion.

Hanwha System's investment consolidates its growing ambition to become one of the main stakeholders in the LEO landscape and follows its acquisition of UK phased antenna start-up Phasor Solutions and the formation of a strategic partnership with satellite communications company Kymeta in 2020. Hanwha System will now also hold a seat on OneWeb's board of directors and is expected to bring added defence capabilities to the company. OneWeb's initial constellation is now reportedly fully funded and set to deliver global coverage by 2022.

SpaceX signs new launch agreements and aims to use Starship for Starlink Gen2

Credit: SpaceX

SpaceX seeks to use Starship to launch the second generation of Starlink

On August 18th, SpaceX submitted an amended filing to the FCC for the launch and operation of its pending second generation Starlink satellite constellation. In the new document, the company proposes two alternative system configurations for the system and satellite designs, which could make use of its upcoming Starship launch vehicle. In the first proposed configuration, SpaceX would fully leverage the capacity of the Starship to launch more mass to orbit at a higher rate, while the second configuration also leverages the company's Falcon 9 launch vehicle. Both proposals aim to provide denser rural coverage without increasing the number of planned satellites nor requiring more spectrum than outlined by the company in its original 2020 filing.

Planet and SpaceX sign multi-year launch agreement

On August 5, Planet and SpaceX signed a multi-year launch agreement that will make the latter company the go-to launch provider for the deployment of Planet's future satellites through 2025. SpaceX has so far carried out seven launches for Planet, the last of which occurred aboard the company's Transporter-1 mission in January. Planet expects to launch 44 SuperDoves satellites aboard a Falcon 9 rocket in the December 2021 Transporter-3 mission as a part of the agreement. The multi-year agreement is not exclusive, and Planet projects to maintain a diversified launch manifest in order to mitigate the risks related to launch activities and benefit from launches to dedicated orbits.

Intuitive Machine selects SpaceX's Falcon 9 for IM-3 lunar mission

Intuitive Machine and SpaceX sealed an agreement for the launch the IM-3 mission aboard a Falcon 9 rocket in 2024. The company had previously selected SpaceX's Falcon 9 for the launch of its first two lunar lander missions, the IM-1 and IM-2. Whereas the first two missions are part of NASA's Commercial Lunar Payload Services (CLPS) program, the IM-3 is not linked to the programme and will be carrying up to 130kg of payloads to the lunar surface through the company's Nova-C lander. The IM-1 and IM-2 missions are set to launch in Q12021 and Q42022 respectively.

Rocket Lab goes public and signs new deals, SEC documents raise questions

Rocket Lab began trading on the Nasdaq stock exchange following its merger with Vector Acquisition, which was officially approved by the SPAC's shareholders on August 20th. The merger established the company's enterprise value at $4.1 billion and injected $777 million in cash in the company before transaction expenses. Following the filing of documents with the SEC in July, Rocket Lab reported net losses in 2020 and Q12021 but is expecting to achieve a positive EBITDA in 2023 through its launch and satellite bus operations. Nevertheless, public documents released by the company raised questions about the financial situation of the company. The company has signed contracts with Finnish start-up Aurora Propulsion Technologies to launch their AuroraSat-1 in Q42021 as well as with global monitoring provider BlackSky for back-to-back launches in September.

Rocket Lab also signed a deal with Varda Space to support the start-up's initial three missions in 2023 and 2024 with its Photon satellite bus. The company's Photon has furthermore been selected by NASA for its planned Escape and Plasma Accelerate and Dynamics Explorer (ESCAPADE) science mission to Mars, which is set to launch in 2024.

In other news

Firefly Aerospace launches new business line for the supply of spaceflight components: The company expanded their activities from the manufacture of launch vehicles to the development and supply of rocket engines and other spaceflight components for New Space companies. The start-up aims to become a reliable sourcing partner for the New Space industry by supplying components from its own spaceflight vehicles which have already established flight heritage.

Amazon addresses letter to FCC seeking the dismissal of SpaceX's amendments for Starlink Gen2: The letter, which was submitted through Amazon's Kuiper Systems subsidiary, asks for the dismissal of SpaceX's recent amended filing to the FCC for the deployment and operation of Starlink's second generation of satellite. Specifically, Amazon argues that SpaceX's pending application does not meet the requirements set by FCC rules because it is too speculative, in particular as the company submitted two potentially exclusive approaches.

iSpace unveils new lunar lander at 36th Space Symposium: The Japanese company plans to use the lander starting from its third mission currently scheduled for 2024. The new lander is projected to be capable of carrying 2000kg to lunar orbit and 500kg to the lunar surface, a significant improvement compared to its current solution. iSpace will develop and build the lander in its Denver facility, with the objective of competing for future NASA CLPS calls.

AAC Clyde Space to open a subsidiary in South Africa: The company announced the launch of their new subsidiary based in Cape Town. The business will act as a center for the design, building, and delivery of space missions on the African continent, as well as for the advanced radio communications systems for the AAC group.

Virgin Orbit increases the pricing of each seat for next flights to $450 000: Virgin Orbit has moved forward with the sale of "private astronaut" seats for its future space tourism missions and increased the pricing for each seat from the initial $250 000. The new pricing came as the company reported $91 million in net losses during its second quarter earnings announcement.

Orbion Space Technology signs contract with U.S. Air Force: The contract was awarded by the AFWERX as part of the Phase II Small Business Innovation Research (SBIR) programme and is for the demonstration of a new collision-avoidance feature developed by Orbion Space. The feature is named El Matador and will be based on the company's Aurora Hall thruster.

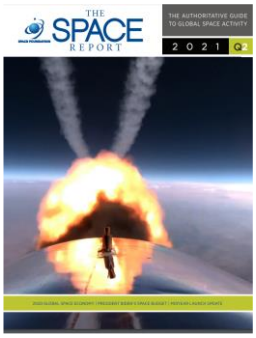
Collins Aerospace awarded contract to provide life support systems: Collins Aerospace announced a $2.6 million contract awarded by an undisclosed customer to provide ECLSS technologies for a private LEO outpost.

Slingshot Aerospace launches its Slingshot Beacon platform: The solution represents a new centralized coordination platform for satellite owners and operators and is expected to be tested by OneWeb, Spire Global, and Orban Fab. The system would allow satellite owners and operators to share space traffic information and increase space safety through increased communication.

Tethers Unlimited demonstrates innovative de-orbiting technology: The company presented the result of the deployment of three Terminator Tapes, one of which was able to lower a satellite into Earth's atmosphere in only 8 months.

Economy & Business

The Space Foundation estimates that the space economy reached $447 billion in 2020



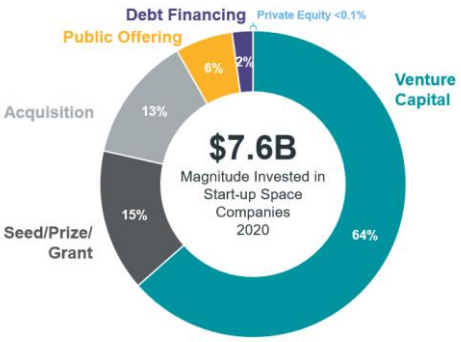
Credit: Space Foundation

The Space Foundation released its annual figures regarding the state of the Global Space Economy for the year 2020 in the second quarter of its Space Report 2021. According to the report, the global space economy in 2020 was valued at $447 billion. Notwithstanding the effect of the global pandemic on the economy and on industry, the figure represents a 4.4% increase compared to its $428 billion value in 2019. The Space Foundation attributes most of the spending (80%) in the space economy to the Commercial Infrastructure & Support Industries and the Commercial Space Products & Services sectors and finds that global government space spending declined by 1.2% to $90.2 billion in 2020. Within the government space spending, the document highlights an increase in budget spending from the U.S., China, ESA and Japan compared to 2019, but also reports a reduction in spending of over 30% in Russia, Italy, Brazil and India.

Swiss IoT satellite company Astrocast successfully completes IPO and raises CHF 40 million

The Swiss IoT satellite company Astrocast completed its IPO on August 25th by listing on the Euronext Growth Market in Oslo. Prior to its public listing, the company also issued new shares to investors and successfully raised an additional CHF 40 million in capital. The new funding was essentially led by a syndicate managed by Adit Ventures and also included Venture Capital firm Primo Space and Palantir. The Swiss company currently operates 10 satellites in LEO and expects to use the additional fund raised this month to continue the development of its planned constellation, as it seeks to reach the 100 satellites milestone in 2024. Astrocast forecasts to hold an estimated market share of 25% for satellite IoT devices in 2025 and plans to be EBITDA positive in by 2024. The company estimates an annual capital expenditure of approx. CHF 17 million once it reaches its 100-satellite constellation, with each satellite costing roughly CHF 505 000 to build. Astrocast currently uses ground stations operated by Leaf Space and KSat for its satellite network.

BryceTech estimates investment in space start-ups at $7.6 billion in 2020

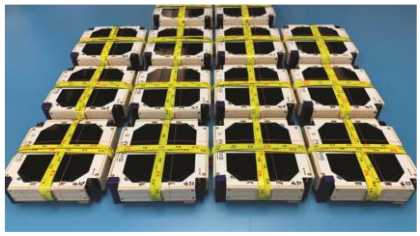


Credit: BryceTech

BryceTech released its yearly Start-up Space report on August 26th, highlighting the main trends and updates in global commercial investment in space start-ups in 2020. In particular, the company reports a total of $7.6 billion invested in space start-ups in 2020, which it defines as a "space firm that has received and reported seed funding or venture capital". The 2020 figures represent a $1.9 billion increase compared to those reported in BryceTech's 2019 report. In line with other years, the majority of the volume invested (64%) in space start-ups came through Venture Capital followed by Seed funding. In terms of number of investments made, BryceTech counts 140 deals completed in 124 space start-ups and coming from 342 investors. The U.S. remains the leader in terms of volume of investments attracted in 2020, with approx. 47 start-ups raising 67% of the total invested during the year.

In addition, the report also shows that, similarly to previous years, most of the funding was raised by SpaceX, OneWeb, Blue Origin and Virgin Galactic, which account for a combined 63% of total investments.

SpaceX acquires Swarm Technologies



Credit: Swarm Technologies

U.S. satellite communication company Swarm Technologies filed an FCC form August 6th to seek approval for a proposed transaction that would transform it into a wholly owned subsidiary of SpaceX. The acquisition would represent a first for SpaceX, as it looks to develop its capabilities notably to expand its activities related to its Starlink satellite constellation. Specifically, the FCC filing demands approval for the transfer of Swarm's current earth and space station licenses as well as any other of the company's pending FCC license requests. Swarm Technology operates 120 satellites as well as ground stations and expects to benefit from the transaction through SpaceX's capitalization and industrial capabilities as it continues to develop its own constellation. Although Swarm's satellites and ground stations operate in a different frequency band to those used by Starlink, the acquisition is also expected to benefit SpaceX's future operations.

Virgin Orbit to merge with SPAC NextGen Acquisition Corp. II

Virgin Orbit entered into a definite agreement with SPAC NextGen Acquisition Corp. II as the company seeks new funds to expand its operations. The merger values the company at $3.2 billion. Virgin Orbit is expected to raise a total of $483 million in growth capital from the merger, which includes a $100 million Private Investment in Public Equity (PIPE) led by Airbus and AE Industrial Partners. The company is currently privately held by Richard Branson's Virgin Group, who also owns the space tourism company Virgin Galactic with a minority ownership stake held by the Abu Dhabi sovereign wealth fund Mubadala. Virgin Orbit plans to use the new funds to continue the development of it LauncherOne launch vehicle, in particular as the company seeks to increase its capacity and possibly include a reusable or recoverable first stage. In addition, the company projects to pursue a new a line of business focused on the provision of space solutions such as IoT and Earth Observation services. Although the company is estimating a net loss of $155 million for 2021, it forecasts a positive EBITDA of $229 million in 2024 and $854 million in 2026 stemming from both its launch and space solutions activities.

iSpace raises $46 million

On August 4th, Japanese start-up iSpace raised $46 million in a new round of Series C funding. The latest round was led by Japanese Venture Capital firm Incubate Fund and included the participation of Aizawa Investments as well as funds managed by SBI Investment Co. and Innovation Engine. The company plans to use the proceeding from its Series C round to continue development of its lunar landers, with a particular focus on its projected second and third missions scheduled for 2023 and 2024 respectively. Specifically, iSpace is looking to increase the size of its lander for its third lunar mission. The start-up recently began assembly of its first lander, the Hakuto-R, at the ArianeGroup facility in Lampoldhausen. The Hakuto-R is scheduled for launch in the second half of 2022 aboard a SpaceX Falcon 9 and will deliver a series of payloads including the United Arab Emirates' Rashid lunar rover. Following its Series C funding, iSpace has now raised approx. $195.5 million since its first seed round in 2014.

In other news

Endurosat and EIB conclude €10 million venture debt financing agreement: The agreement aims to support the company's expansion as Endurosat continues the development of its nanosatellites as well as its Share Satellite Service. The financing agreement is backed by the European Guarantee Fund (EGF), which was set-up by the EIB to support businesses during the pandemic.

Beijing Lingkong Tianxing Technology raises $46.3 million: The funding round was led by Matrix Partners China and Shanghai Guosheng Group, a major state capital investor. The company, also known under the name Space Transport, will use the new funds to expand the development of its projected commercial ballistic and hypersonic spaceplane with the objective of conducting the first crewed tests in 2025.

Intelsat amends restructuring plan to exit Chapter 11: The amendment differs from the original restructuring plan filed by the company in February as, under the new plan, the company would no longer exit Chapter 11 bankruptcy as a public company. The amended plan received wider approval from the company's creditors, receiving the support of holders accounting for approx. 75% of its funded debt. The plan is now pending approval by the U.S. Bankruptcy Court for the Eastern District of Virginia.

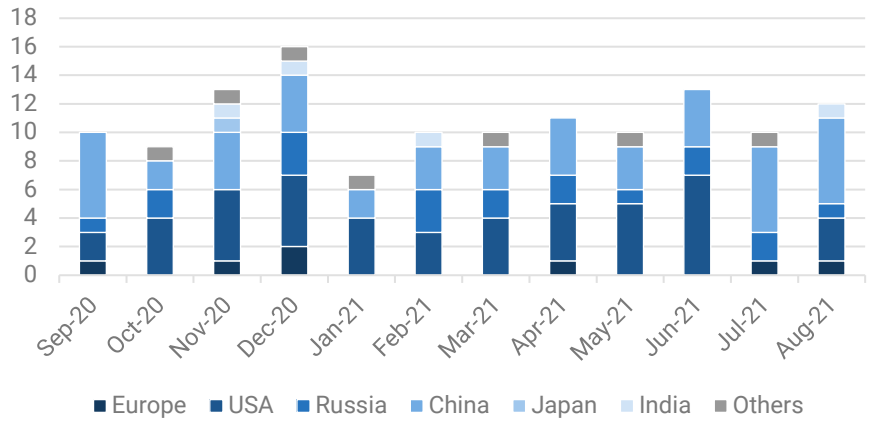
Estonian start-up SpaceIT raises €1 million in pre-seed funding: The funding round was led by the Finnish Venture Capital firm Icebreaker.vc and also included the participation of UG Investment. The company projects to use the new funds to expand its cloud-based mission control platform, which aims to provide satellite and terrestrial operators the capability of securely communicating through their system.

Launches & Satellites

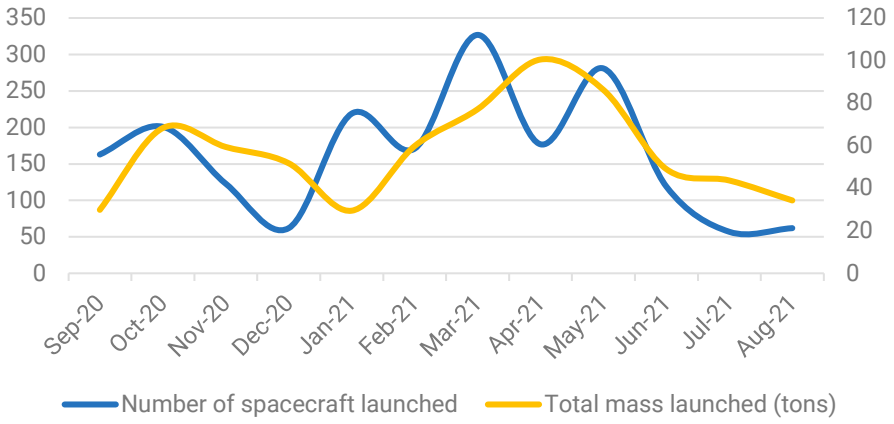
Global space activity statistics

August 2021	Europe	USA	Russia	China	India	Total
Number of launches	1	3	1	6	1	12
Number of spacecrafts launched	5	12	34	10	1	62
Mass launched (in kg)	932	14 091	4998	12 008	2268	34 297

Launch activity over the year

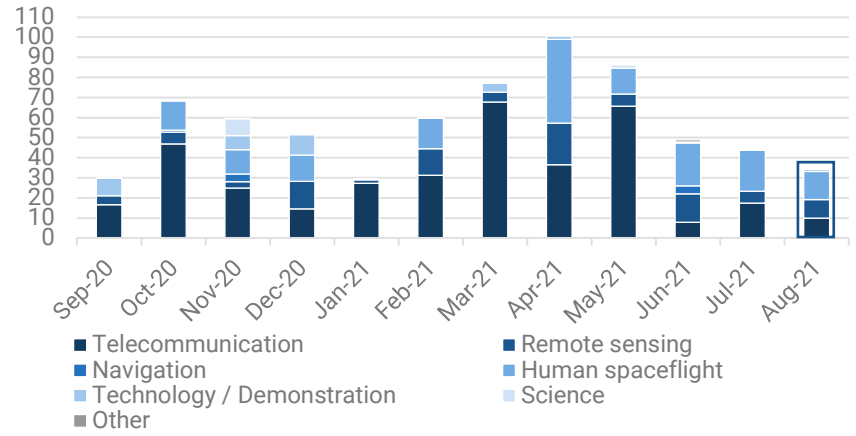


Evolution of the number of launches per launch country



Evolution of launch activity over the year 2020-2021

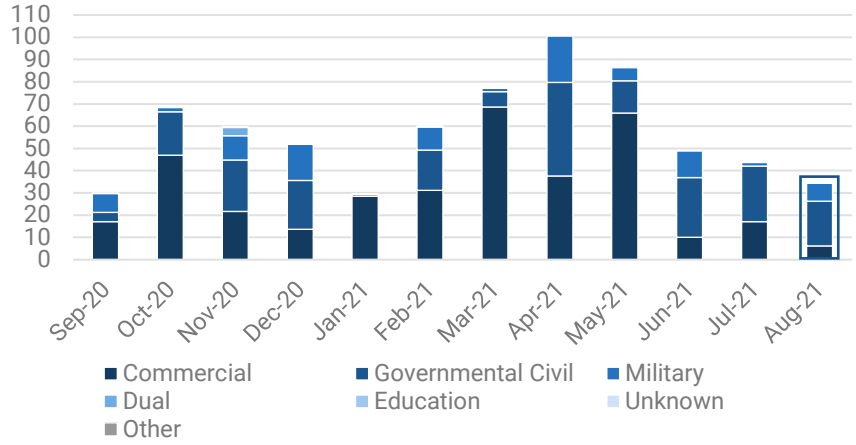
Satellite missions and markets



Evolution of the total mass launched (tons) per mission (Sep. 2020-Aug. 2021)

August 2021	Telecom	Remote sensing	Human Spaceflight	Technology/ Demonstration	Science	Other
Europe	4998	926		252		
USA			14 000	56		20
China	5000	6000		768		
India		2268				
Others				6	3	

Total mass (kg) launched by mission and customer country



Evolution of the total mass launched (tons), per market (Sep. 2020-Aug. 2021)

August 2021	Commercial	Governmental Civil	Military	Education
Europe	6170	6		
USA		14 004	68	4
China	18	3750	8000	
India		2268		
Others		4		5

Total mass (kg) launched by market and customer country

Launch Log

Launch date	Launch country	Launcher	Spacecraft name	Main customer	Customer country	Prime manufacturer	Manufacturer country	Mass (kg)	Mission	Market
03/08/2021	China	Hyperbola-1	Jilin-1 Mofang-01A	Chang Guang Satellite Technology Co.	China	Chang Guang Satellite Technology Co.	China	18	Tech / Demo	Commercial
05/08/2021	China	CZ-6	KL-Beta (A & B)	KLEO Connect	Germany	CAS	China	120 (each)	Tech / Demo	Commercial
05/08/2021	China	CZ-3B/G3	ZhongXing 02E / ShenTong 2E	People's Liberation Army	China	CAST	China	5000	Telecom	Military
10/08/2021	USA	Antares-230+	Cygnus CRS-16	NASA	USA	Northrop Grumman	USA	8000	Cargo Transfer	Governmental Civil
			PIRPL	SDA	USA	Northrop Grumman	USA	48	Tech / Demo	Military
11/08/2021	India	GSLV Mk.2(4)	GISAT 1 / EOS 3	ISRO	India	ISRO	India	2268	Earth Observation	Governmental Civil
17/08/2021	France	Vega	BRO 4	UnseenLabs	France	GOMSpace	Denmark	6	Signal Intelligence	Commercial
			LEDSAT	La Sapienza University of Rome	Italy	La Sapienza University of Rome	Italy	1	Tech / Demo	Governmental Civil
			Pléiades Neo 4	Airbus	France	Airbus	France	920	Earth Observation	Commercial
			RADCUBE	ESA	Europe	C3S	Hungary	3	Tech / Demo	Governmental Civil
			Sunstorm	ESA	Europe	Reaktor Space Lab Ltd	Finland	2	Tech / Demo	Governmental Civil
18/08/2021	China	CZ-4B	Tianhui 2-02 (A & B)	CASC	China	CASC	China	1500 (each)	Earth Observation	Governmental Civil
21/08/2021	Russia	Soyuz-2-1b Fregat	OneWeb L9 (34 satellites)	OneWeb Ltd.	United Kingdom	OneWeb Satellites (USA)	USA	147 (each)	Telecom	Commercial
24/08/2021	China	CZ-2C(3)/YZ-1S	RSW 1 & 2	Unknown (China, Public)	China	CAST	China	350 (each)	Tech / Demo	Governmental Civil
			Unknown (China)	Unknown (China, Public)	China	DFH Satellite Co.	China	50	Tech / Demo	Governmental Civil
24/08/2021	China	CZ-3B/G3	TJS 7	People's Liberation Army	China	SAST	China	3000	Early Warning	Military
28/08/2021	USA	Astra Rocket-3	STP-27AD1	US Space Force	USA	US Space Force	USA	20	Other	Military
29/08/2021	USA	Falcon-9 v1.2 (Block 5)	Binar-1	Curtin University	Australia	Curtin University	Australia	1	Tech / Demo	Governmental Civil
			CAPSat	University of Illinois at Urbana-Champaign	USA	University of Illinois at Urbana-Champaign	USA	4	Tech / Demo	Governmental Civil
			CUAVA 1	CUAVA	Australia	CUAVA	Australia	3	Tech / Demo	Education
			Dragon-CRS 23	NASA	USA	SpaceX	USA	6000	Cargo Transfer	Governmental Civil
			IOD-AMBER	Horizon Technologies	United Kingdom	ÅAC Clyde Space	Sweden	6	Tech / Demo	Commercial

Maya 3	University of the Philippines-Diliman	Philippines	University of the Philippines-Diliman	Philippines	1	Tech / Demo	Education
Maya 4	University of the Philippines-Diliman	Philippines	University of the Philippines-Diliman	Philippines	1	Tech / Demo	Education
PR-CuNaR2	Inter-American University of Puerto Rico	Puerto Rico	Inter-American University of Puerto Rico	Puerto Rico	3	Space Science	Governmental Civil
SPACE-HAUC	University of Massachusetts	USA	University of Massachusetts	USA	4	Tech / Demo	Education

Launch Highlights

A busy month for the Chinese space sector

Credit: i-Space

In August, the Chinese launch activity followed at a quick pace. Indeed, the country conducted five launches during the month, although one of them failed. This failure occurred during the iSpace's third launch of its Hyperbola rocket, marking the second consecutive unsuccessful attempt for the launcher.

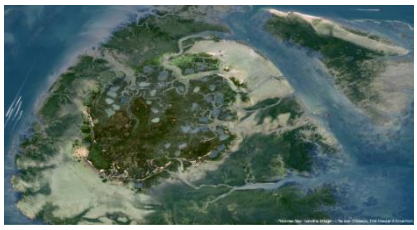
On top of this intensive activity, some of the launches were conducted with little time interval. For instance, on August 5th, two launches took place on the same day. Similarly, on August 24th, two launches were conducted in four hours, although they both were carried out from different spaceports. In total, China has launched 30 times in 2021.

A major Indian payload fails to launch

Credit: ISRO

On August 11th, India conducted its second launch of the year, which failed five minutes after liftoff due to a problem with the upper stage. The rocket used for the launch was a new version of ISRO's GSLV whose fairing was modified to accommodate larger spacecraft. The satellite on board, EOS-3 (formerly known as GISAT-1) was an Earth observation spacecraft planned to be placed in geostationary orbit to monitor the Indian subcontinent and serve as a quick response tool in case of natural disaster or other short-term major events. The launch of the satellite, first expected in March 2020, had already suffered delays due to technical issues and the coronavirus pandemic.

A new launch for Pléiades Neo



Credit: Airbus Defence & Space

On August 17th, Arianespace launched the second Vega rocket of 2021, carrying one primary spacecraft for Airbus and four auxiliary payloads. The Airbus' spacecraft is the second satellite in the Pléiades Neo's constellation, allowing the company to provide images with a 30 cm resolution. Two other spacecraft will join them in the future, planned to be sent to orbit on a single Vega C launch. Moreover, among the Cubesats that shared the ride, one of them is the fourth satellite of Unseenlabs, a French company providing signal intelligence. This represents the European launch for the start-up, all its previous spacecraft having been launched by Rocket Lab.

Astra fails to reach orbit

Credit: Astra

On August 27th, the launch company Astra, which has a capitalization of $3 billion on the public market, conducted its first commercial launch, with a new version of its rocket, called Rocket 3.3. The payload was a test package for the U.S. Space Force aiming at analysing the flight environment of the rocket. However, the launch failed due to the interruption of an engine one second into the flight. As a result, the rocket moved first sideways before lifting off and could not follow its planned trajectory, hence the decision to abort launch due to security reasons. The day before, the launch had already to be postponed because of technical issues.

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