



ESPI

European Space Policy Institute

ESPI Insights

Space Sector Watch



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G7 SUMMIT: SPACE IS HIGH ON THE GEOPOLITICAL AGENDA



Dear Friends of ESPI,

Earlier in June, the 47th G7 summit took place in Carbis Bay and for, the first time in the twenty-first century, space-related issues have been specifically addressed in the G7 final document and extensively discussed during the Summit. The Group of Seven (DE, CAN, USA, FR, IT, JPN, UK and EU as Observer) recognised the need to use space in a safe and sustainable manner and the importance of cooperation in addressing space issues in order to continue benefitting from it, as space was referred to as one of the “future frontier of the global economy and society”.

In this year’s **G7 Final Communiqué**, the G7 leaders specifically addressed two space-related topics:

- “the importance of developing common standards, best practices and guidelines” to make space operations safe and sustainable.
- “the need for a collaborative approach for space traffic management and coordination”.

Both issues are now high on the geopolitical agenda due to growing concerns related to the massive increase of space activities and of the number of governmental and commercial players involved. On June 18th, Scott Pace, former Executive Secretary of the National Space Council and Director of the Space Policy Institute at the Elliott School of International Affairs, **called on U.S. stakeholders** to be more proactive in addressing these issues, after outlining the main steps that led the U.S. to the current impasse.

The question of space debris mitigation was an important issue addressed during the Summit. In the communiqué, the G7 welcomes “**the UN’s Long Term Sustainability Guidelines and calls on others to join in implementing**” them, and on all interested parties, public and private, to collaborate in researching and developing potential solutions.

Cooperation was an important keyword of this G7. Space geopolitical balances are shifting and G7 leaders highlighted the importance that commitment and political leadership at international level hold to respond effectively to safety and sustainability challenges in the space sector. On the one hand, this confirms that space is a strategic domain with a strong geopolitical dimension and that, as proven in the past, the G7 has the potential to move the lines towards innovative and impactful initiatives. On the other hand, however, the G7 statements are not binding and the Summit’s documents have no legal value. In addition, the leaders made no pledge to take action to address space-related topics and finding concrete solutions to increasingly serious and pressing problems. Instead, the G7 leaders called on nations to cooperate through the appropriate international fora.

Will this be enough? Only time can tell. The expectation is for space to remain high in the geopolitical agenda with the challenge now shifting to the **G20 leaders who will meet in October in Rome** to discuss “People, Planet and Prosperity”. Nevertheless, the space sector is experiencing a quick evolution and we cannot avoid noticing a widening gap between safety challenges and international response. Governments and institutional actors must soon find a way to align themselves and move at the same speed as the private sector if they want to respond effectively to new needs of the space sector.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'JJ Tortora', with a stylized flourish at the end.

Jean-Jacques Tortora

Director of ESPI



POLICY & PROGRAMMES

ESA and EU sign new Financial Framework Partnership Agreement (FFPA)

On June 22nd, the EU and ESA signed the seven-year FFPA that will govern the relationship between the two institutions throughout the 2021-2027 Multiannual Financial Framework, including with the newly created European Union Agency for the Space Program (EUSPA). The European Commission is set to delegate approx. €9 billion in funding to ESA in the framework of the FFPA, in particular for activities concerning the EU space programme for which ESA remains the prime contractor. Specifically, the FFPA gives a clearer oversight over the governance of the EU's Galileo, Copernicus and EGNOS flagship programmes and supports new initiatives in the fields of space commercialisation, secure connectivity and R&D. The conclusion of the FFPA was one of the main priorities highlighted by the new ESA DG Josef Aschbacher in the [ESA Agenda 2025](#) and guarantees the agency's autonomy in carrying out the development and implementation of all its mandatory and optional programmes.



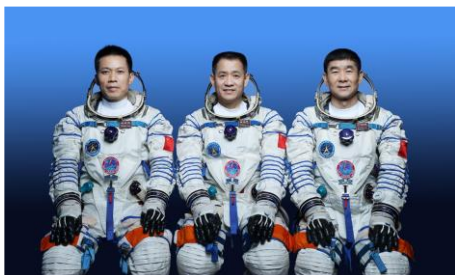
Credit: ESA

New Zealand and Brazil join the Artemis Accords

New Zealand and Brazil became the eleventh and twelfth countries respectively to join the Artemis Accords following their establishment in 2020.

Brazil's signature follows the signing of a **statement of intent** with NASA last December in which former astronaut and current Minister of Sciences Marcos Pontes stated Brazil's ambition to participate in lunar exploration and to potentially develop a lunar rover. The government of New Zealand, which took part in the drafting of the Accords, also highlighted the signing of the Artemis Accords as an important step for the country in terms of economic and foreign policy goals as well as in view of a potential participation in the programme.

China's crewed mission Shenzhou-12 docks with the Tianhe core module



Credit: Global Times

On June 16th, the Shenzhou-12 spacecraft carrying Chinese astronauts Nie Haisheng, Liu Boming and Tang Hongbo successfully docked with the Tianhe core module of China's future Space Station. The mission represents China's first crewed mission since 2016 and is expected to be its longest. The planned three-month long mission is part of a series of 11 projected launches for the assembly of the Tiangong Space Station.

While on board Tianhe, the three astronauts will carry out several operations, including extravehicular activities and the testing of a robotic arm, whose primary objective is to bring the core module into service. Shenzhou-12 is the third mission launched in the scope of assembly and operations activities for the Chinese space station following the launch of the Tianhe module in April aboard a Long March 5B rocket and the docking of the Tianzhou-2 cargo spacecraft to the module last month.



NASA and ESA begin work on future major Venus missions

Both NASA and ESA selected new missions aiming to investigate the evolution of Venus and tackle key questions about its geologic history, surface and atmosphere, as well as the possible past existence of an ocean and life.

NASA selects DAVINCI+ and VERITAS missions

On June 2nd, **NASA selected two missions** and technology demonstrations to study Venus' atmosphere and surface in the framework of its ninth Discovery Program competition. The two missions have each been awarded approx. \$500 million by NASA and are expected to be launched in 2028-2030.



Credit: NASA GSFC

The first mission selected is the Deep Atmosphere Venus Investigation of Noble gases, Chemistry, and Imaging (DAVINCI+), which is expected to make use of a descent probe to study the evolution of Venus' atmosphere. DAVINCI+ is intended to be the first U.S.-led mission to study the planet's atmosphere since **NASA's Pioneer Venus probe** in 1978. The second mission is the Venus Emissivity, Radio Science, InSAR, Topography, and Spectroscopy (VERITAS), which will use a SAR orbiter to map the planet's surface, study its geologic history and search for infrared emissions that could contribute to research on active volcanism on the planet. The Deep Space Atomic Clock-2 and the CUPIS demonstration missions are also expected to fly with the DAVINCI+ and VERITAS missions, respectively.

ESA selects the EnVision mission and partners with NASA

On June 10th, **ESA selected its next Venus orbiter** as its fifth Medium-class mission in the Agency's Cosmic Vision. The orbiter is expected to launch in the early 2030s and will be equipped with multiple innovative instruments aiming to study the evolution of the planet by providing crucial information on its core and atmosphere. The European instrument package will include a sounder to study underground layering, and spectrometers to investigate the planet's atmosphere and surface and to search for signs of active volcanism. In addition, **NASA has also partnered with ESA** to provide additional instruments to the mission. Specifically, the VenSAR radar, which is part of NASA's Discovery programme, is set to map and deliver images of Venus' surface features to investigate connections between the planet's geological processes and atmosphere. The results will be compared with images taken from NASA's Magellan mission to detect changes in the planet's morphology.

ESA selects Voyage 2050 themes



Credit: ESA

On June 11th, **ESA presented the main science themes** part of its Voyage 2050 plan, which focuses on the agency's large-class science missions for the timeframe 2035-2050. The themes selected by the Agency are focused on temperate exoplanets, the giant Solar Systems planets' moons, and physical probes of the early Universe. While the themes comprising ESA's Voyage 2050 plan were selected by the agency's Science Programme Committee this month, the

specific missions that will be undertaken in the framework of the plan will be selected following the issue of individual calls for mission proposals. The Voyage 2050 missions will follow those carried out under ESA's current Cosmic Vision planning cycles for space exploration missions, which runs until 2030. The Committee also identified technologies such as atom interferometry, and the development of technologies related to power sources that are likely to play a significant role in missions beyond 2050.



Roscosmos and CNSA share roadmap for planned International Lunar Research Station (ILRS)

On June 16th, the CNSA and Roscosmos presented the roadmap to their projected ILRS at the GLEX-2021. The new roadmap outlines three separate development phases expected to be carried out by both agencies with potential international public and commercial partners in the next two decades. The first phase is projected to take place between 2021 and 2025 and is aimed at providing detailed data of the lunar surface for future missions through reconnaissance activities to be undertaken by several missions currently under development by the two agencies. The second phase is set to take place between 2026 and 2035 and is divided into two stages aimed at completing the comprehensive establishment of the ILRS by 2035. The third phase finally provides for activities beyond 2036, which would potentially include a human lunar landing.



Credit: CNSA

Roscosmos and CNSA invited international partners to participate. European countries will discuss their ambitions in lunar exploration and approach to international cooperation at the next ESA Ministerial Council in 2022.

U.S. Senate passes NASA Authorization Act and SPACE Act

On June 9th, the U.S. Senate passed the **U.S. Innovation and Competitiveness Act** that includes the 2021 NASA Authorization Act as well as the SPACE Act. The bill now awaits approval from the U.S. House of Representatives where **its future is reportedly uncertain**.

The NASA Authorization Act gives a total budget of \$23.3 billion to the agency for FY 2021. The largest budget items include:

- Science - \$7.2 billion
- Exploration - \$6.7 billion -
- Space Operations, \$3.9 billion
- Safety, Security, and Mission Services - \$2.9 billion

In addition to the budget, the NASA Authorization Act introduces some important provisions for the future of the Agency. The bill extends NASA involvement in the ISS to 2030 and authorises a new budget of approx. \$10 billion for the Human Landing System (HLS) programme in the next five years, thus allowing NASA to select a second contractor for the development of the HLS after its award to SpaceX in April.

The SPACE Act elevates and directs the Office of Space Commerce to manage activities related to civil Space Situational Awareness in relation to U.S. National Policy for Space Traffic Management.

Italian Defence Ministry awards €159 million contract for the development of Sicral-3

The Italian Defence Ministry awarded a **€159 million** contract to Thales Alenia Space and Telespazio to design and develop the new Sicral 3A and 3B military telecommunication satellites. The contract covers development activities until the critical design review phase and has the objective of providing Italy with SHF and UHF-band capabilities in continuity with the current Sicral 1B and Sicral 2 spacecraft, as well as a Ka-band payload. The Sicral 3 satellite will stem from the country's ItalGovSatCom (I-GSC) development programme, which has been supported by Defence Ministry as well as regional governments, and is planned to be integrated in the European Union's GovSatCom programme.



In other news

U.S. Senate confirms nominations in key space governance positions:

- Former astronaut Pam Melroy was nominated as **deputy administrator of NASA**. Prior to her nomination, Melroy also held positions at the FAA's Office of Commercial Space Transportation.
- Rick Spinrad was nominated as **administrator of NOAA** and as undersecretary for oceans and atmosphere at the Department of commerce. Prior to his nomination, Spinrad held various positions at NOAA and the U.S. Navy.

Japan adopts national law for the exploitation of space resources: The Parliament of Japan officially adopted the Law Concerning the Promotion of Business Activities Related to the Exploration and Development of Space Resources. The country thus became the fourth country following the U.S., Luxembourg, and the United Arab Emirates to adopt a national regulation allowing for the commercial exploitation of extracted space resources.

France and United Arab Emirates to cooperate on Emirates Lunar Rover (ELR) mission: CNES and the Mohammed Bin Rashid Space Centre (MBRSC) launched a cooperation initiative to work closely in several phases of the mission, which is expected to launch in 2022. CNES will provide CASPEX cameras to the MBRSC as part of the initiative, which will make the cameras the French experiments to be sent to the moon in 50 years.

U.S. Airforce launches Rocket Cargo programme for rocket-based military cargo delivery: The USAF launched Rocket Cargo as its fourth Vanguard programme, with the objective of analysing the viability of using commercial rockets for end-to-end transportation services of cargo on behalf of the DoD global logistics. A budget of \$47.9 million was proposed by the USAF for rocket cargo in its budget proposal for FY2022.

CNES and ArianeGroup sign two contracts worth a total of €16 million: The first contract, valued at €15 million, aims to accelerate the development of the Prometheus reusable engine demonstrator while the second, valued at approx. €1 million, underpins a technology demonstration for the recovery of hydrogen lost from storage areas by natural evaporation into the atmosphere. The two contracts are part of the French government's Plan de Relance, as was previously confirmed by President Emmanuel Macron during his January visit in Vernon.

Airbus-GAF consortium launches the European VHR2021 Project by starting data acquisition: The objective of the project is that of optimising the acquisition of data acquired from satellites operated by the consortium and provide very high-resolution (VHR) coverage of Europe in 2021.

NASA completes first payloads selection for future Moon deliveries: Three scientific investigation payload suites and two project scientists were selected in the scope of NASA's Payloads and Research Investigations on the Surface of the Moon (PRISM) call for proposals. The agency projects to send the payloads to the Moon as part of its CLPS initiative by 2024, with two of them intended to make history as the first NASA payloads to successfully land on the far side of the Moon.

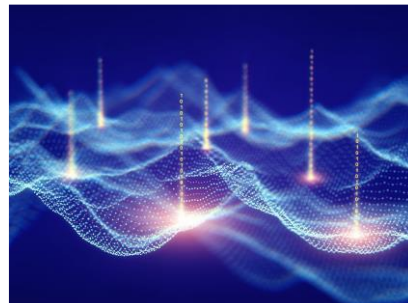
U.S. Army awards a research and development contract worth up to \$30 million to Iridium: Object of the contract is the development of a payload technology that will be integrated in a future LEO commercial satellite constellation to complement the capabilities of Iridium's current constellation. The aim is to support the U.S.'s GPS and GPS-denied precision systems by providing more effective data transmission capabilities from sensors to soldiers on the field.



INDUSTRY & INNOVATION

Major developments in Europe in the space quantum domain

The European Commission **selected Airbus Defence and Space and Deutsche Telekom** to lead two consortia with the objective to study quantum technologies to then develop a European Quantum Communication Infrastructure (EuroQCI). Both contracts are valued at approx. €2.5 million and are expected to run for 15 months. The EuroQCI is projected to provide an ultra-secure solution for communication, in particular for government users and critical infrastructures. The EuroQCI will include a ground and space segment for quantum key distribution.



Credit: Airbus

In addition, the UK quantum encryption technology start-up Arqit **formed an international consortium** of companies and institutions called Federated Quantum Systems (FQS), with the aim of providing its quantum encryption technology to government customers. The formation of the FQS represents an additional milestone for international partnership in the field of quantum technologies applied to space. The UK, United States, Japan, Canada, Italy, Belgium and Austria are part of the consortium.

More detailed information on the links between quantum and space in Europe is available in the **ESPI Executive Brief 51**, free for download.

Rovial leads consortium for independent European Satcom constellation

The French satellite communications company Rovial is **leading an industrial consortium** composed of members of the European NewSpace start-ups with the objective of establishing an independent European Satcom constellation. The consortium includes companies such as Mynaric, Isar Aerospace and Reflex Aerospace, as Rovial projects to broaden the participation also to secondary suppliers of subsystems. The resulting consortium is independent but aims to support some of the priorities set by the current European Commission for its secure communication constellation project, whose first demonstration mission is to be launched in 2022. Specifically, the consortium aims to support the “Autonomy and sovereignty”, the “Green Deal” and the “Digitalization” priorities set by the Commission with its technology, which will provide variety of applications in the fields of IoT, defence and autonomous vehicles amongst others.

Winning bidder purchases seat on New Shepard for \$28 million



Credit: Blue Origin

Blue Origin **auctioned one of the remaining seats** on the first planned first crewed flight of its New Shepard suborbital vehicle following an auction held by the company on June 12th, with the winning bidder purchasing the seat for \$28 million. The bidder is expected to join Blue Origin founder Jeff Bezos and his brother on the inaugural flight, which is projected to be carried out on July 20th. The company’s New Shepard vehicle has successfully performed 15 times in uncrewed tests, with the most recent test taking place last

April. The proceeds from the auction will be donated to the Club for the Future educational non-profit foundation. In addition, the company **selected Wally Funk as an honoured guest** for the flight. Wally Funk was part of the First Lady Astronaut Trainees (FLAT) programme, also known as Mercury 13, and is set to become the oldest person to travel to space.



Rocket Lab awarded contract to design spacecrafts for NASA Mars Scientific Mission

On June 15th, the University of California Berkeley Space Sciences Laboratory (UCBSSL) **awarded a contract to Rocket Lab** for the design of two Photon spacecraft to be used in NASA's Escape and Plasma Acceleration and Dynamics Explorers (ESCAPADE) scientific Mars mission. The ESCAPEDE mission is developed in the framework of the agency's Small Innovative Missions for Planetary Exploration (SIMPLEx) programme and has the objective of studying the planet's hybrid magnetosphere with a view on gaining a better understanding Mars's climate. The two Photon spacecraft, called Blue and Gold, are scheduled to launch in 2024 and will carry out a one-year primary science mission following their insertion into an elliptical orbit around the planet.



Credit: Rocket Lab

Axiom Space purchases SpaceX the launch of its new private astronaut missions

On June 3rd, Axiom Space and SpaceX **concluded an agreement** for the launch of three additional private astronaut missions to the ISS to be carried out on board the Crew Dragon. The three missions are Ax-2, Ax-3 and Ax-4 and are all planned to be launched by 2023. Axiom and SpaceX previously concluded a similar agreement for the Ax-1 mission, which is scheduled for launch in early 2022. The **agreement between Axiom Space and NASA** for the company's first crewed mission was concluded last May and is part of NASA's low-Earth commercialization strategy.

SpaceChain sends Ethereum cryptocurrency technology payload to ISS

The Singapore-based company **sent their blockchain-enabled Ethereum payload** to the ISS aboard a SpaceX Falcon 9 on June 4th. The launch marks the fourth blockchain mission sent to space by SpaceChain, following a similar mission for their Bitcoin technology payload concluded in December 2019. The mission was enabled by **Nanorack's Space Act agreement** with NASA, as Spacechain's hardware will be installed in Nanorack's commercial ISS platform prior to its demonstration. Once activated, the company's solution will bring additional security to the transmission of digital assets for their customers. The Australian company Nexus is Spacechain's first customer for this mission, as it aims to enable its clients to carry out on-orbit multi-signature transactions with an added degree of security.

Anywaves signs 5-year contract with Airbus Defence and Space



Credit: Airbus

On June 24th, the French start-up Anywaves **signed a 5-year umbrella contract** with Airbus Defence and Space for the provision of eight initial S-band antennas to be integrated in Airbus' CO3D medium-resolution Earth observation satellite constellation. The CO3D constellation has the objective of building 3D digital terrain models, in particular for the French Defense Ministry and is co-financed by Airbus and CNES, with the latter investing approx. €100 million euros for the initial constellation. Whereas the eight S-band antennas will be used to cover the initial four-satellite large constellation, the company currently plans to deliver tens of antennas for Airbus in the framework of its next orders. Airbus and CNES seek to launch more than 20 satellites to complete the constellation.



Lockheed Martin receives \$1 billion contract to maintain and operate SBIRS ground systems

Lockheed Martin was awarded a **five-year sole-source contract valued at \$1 billion** for the operation and maintenance of the control centres of the Space Based Infrared System geostationary satellites (SBIRS) for the U.S. Space Force. SBIRS is part of the ballistic missile launches detection warning network of the U.S. Department of Defence. As SBIRS' primary contractor since the mid-1990s, Lockheed Martin will not only oversee the logistical support needed for existing ground infrastructures but also the upgrades required to operate SBIRS GEO-5 and SBIRS GEO-6 satellite. In addition, the contract also covers the maintenance costs related to the operation of the existing ground systems as well as those for future upgrades needed for the operation of the two additional satellites.

ArianeGroup signs prototype development contract with MT Aerospace for Ariane 6

Arianespace **signed a prototype development contract** with the German company MT Aerospace for the development of an optimised upper stage for the Ariane 6 launcher. The award was made in the framework of **ESA's Future Launchers Preparatory Programme (FLPP)**. The FLPP is the agency's programme dedicated to supporting research in new technologies aimed to increase performance and reduce operational costs for European launchers. MT Aerospace will deliver an upper stage demonstrator in the next three years, which will make use of carbon fibre reinforced plastic (CFRP) in Ariane 6's upper stage propellant tanks and structures.

Airbus selects Eutelsat Communications' satellite to carry its Ultra High Frequency payload

Airbus Defence and Space **selected Eutelsat Communications' EUTELSAT 36D satellite** to embark its latest Ultra High Frequency (UHF) payload. The award follows the signing a contract between the two companies in March for the manufacture and delivery of the Eutelsat 36D satellite by Airbus. Airbus' UHF is a military payload that will serve armed European and NATO forces, with the company having received orders by the French government to support communications over the EMEA region. The satellite is due for launch in 2024.

Microsoft joins the Space Information Sharing and Analysis Center

On June 23rd, Microsoft **joined the Space Information Sharing and Analysis Center (ISAC)** as a founding member, becoming one of the first hyperscale cloud service part of the centre. The ISAC is the first centre for information sharing and analysis dedicated to space and was launched in 2019. Microsoft aims to use its expertise in cybersecurity to expand its role in the space sector and contribute to the centres objective of enhancing the protection of critical infrastructures and space-based assets.

The World Economic Forum (WEF) introduces Space Sustainability Rating



Credit: World Economic Forum

The WEF's Global Future Council on Space Technologies **developed a new Space Sustainability Rating (SSR)** in collaboration with a consortium of entities that includes ESA and the MIT Media Lab. The objective of the SSR is to provide a solution to curtail the formation of orbital debris through a public-private collaboration multi-stakeholder approach, which will enable organisations to give their missions a certification for sustainability based on a range of factors. Among these factors, the WEF has included behaviours such as the choice of orbit, the measures taken to avoid collisions, data sharing, and plans to de-orbit satellites. The EPFL Space Centre (eSpace) of the Swiss Federal Institute of Technology Lausanne was selected as the entity responsible for the operation of the SSR following a competitive process, also taking into consideration the Centre's experience in space sustainability, in particular following the creation of ClearSpace.



In other news

TIM launches satellite-based broadband service using Eutelsat's Konnect satellite: The Italian company's new service will allow customers in areas not covered by its broadband and ultrabroadband network to access internet connectivity by exploiting Eutelsat's Konnect capabilities. The launch of the service follows TIM's capacity purchase from Eutelsat in November 2020.

Inmarsat partners with Skylo to deliver narrowband IoT over satellite solution: Within the framework of their agreement, the start-up will deliver its IoT solutions to connect machines and sensors by using Inmarsat's global satellite network capacity backbone. Skylo's solution provides customers in remote areas with real-time actionable insights and connectivity.

Satellite operators reach 120 MHz C-band clearance milestone: The clearance target is in line with the FCC's accelerated transition deadlines as decided in January. Following the clearance, the spectrum rights will be transferred to U.S. wireless companies in December 2021. SES and Intelsat are the operators with the largest share of the spectrum and will receive approx. \$2 billion from the FCC following the full clearance of their respective shares.

Industrial partnership to accelerate on-orbit satellite imagery through downlinks optimisation: V-Nova's VC-6 technology will be implemented in Unibap's SpaceCloud and embedded into D-Orbit's ION SCV Dauntless David spacecraft, scheduled for launch in June 2021. V-Nova developed the high-performance AI-powered software library to speed up images' transmission from LEO satellites to earth stations through automatic computer vision's operations.

Intuitive Machines awards AAC Clyde Space a \$1 million subsystems order for its lunar mission: In the scope of the award, AAC Clyde Space is expected to deliver battery systems as well as "Starbuck", its most powerful and efficient system for advanced space missions, for Intuitive Machine's ice-drilling mission (IM-2). The IM-2 mission is part of NASA's CLPS programme.

Operation Arctic Lynx (OAL) takes place to demonstrate satellite capabilities in polar regions: More than 20 international organisations participated in the OAL field exercises to demonstrate Iridium and Iridium Connected technologies, such as weather resilient satellite communications and sensors. The exercises were partnership driven and involved more than 20 organisations including the Department of Defence.

D-Orbit and Aisetech Space sign launch contract: The contract is for the in-orbit deployment of Aistech Space's Guardian 6U CubeSat aboard D-Cube's ION Satellite Carrier. Aistech Space projects to launch 20 Guardian satellites as part of its thermal data commercial constellation, which will be part of a future 120 small satellite-large multi-payload and multi-platform constellation.

GMV will provide the satellite control centre for Al Yah Satellite Communications Company: UAE-based Yahsat awarded a contract to GMV for the delivery and integration of control centre and flight dynamics system for the company's Thuraya 4-NGS next generation L-Band satellite. Yahsat expects the Thuraya 4-NGS to begin operations in 2024.

Iceye joins ESA's Third Party Mission portfolio: Iceye became the first SAR satellite company to be approved by the ESA Earth Observation Programme Board to join its Earthnet Program Third Party Missions (TPM) data portfolio, granting interested parties free access to Iceye's SAR data and imaging modes.



ECONOMY & BUSINESS

Bharti Global invests additional \$500 million in OneWeb

On June 29th, Bharti Global exercised a Call Option to purchase an additional \$500 million in OneWeb equity, thus becoming the biggest shareholder in the company. The latest investment follows a similar capital injection carried out by the company in 2020 in conjunction with the UK government after OneWeb's Chapter 11 bankruptcy filing. The company has now secured \$2.4 billion in total funding following investments from Eutelsat, Softbank and Hughes Network Systems, who invested \$550 million, \$350 million, and \$50 million respectively. Upon the completion of the current Call Option in the second half of 2021, Bharti Global will own 38.6% of the company with the UK Government, Eutelsat and Softbank each holding 19.3% of the company's stakes. OneWeb's 648-satellite large constellation is now fully funded, with the company having reached reach its original funding objective.



Credit: OneWeb

Isar Aerospace receives €57 million in additional funding

The German small launcher start-up Isar Aerospace raised an additional €57 million in a new Venture capital funding round led by the venture capital firm HV Capital, who also participated in the company's €75 million Series B round in December 2020. Following the latest Venture round, the company's pre-money valuation stood at approx. €500 million as it accelerates the development of its Spectrum small launch vehicle. Isar Aerospace was also selected by the DLR as the winner of the second phase of its Microlauncher competition in April and recently signed a multi-year agreement with Andoya Space for exclusive access an orbital launchpad in the Andoya Spaceport. As the winner of the DLR competition, the company unlocked an additional €11 million in funding and could be considered eligible for future European launches alongside Ariane 6 and Vega-C following the provision of a letter of support from DLR to ESA presenting a formal service proposal in favour of the start-up.

4iG to acquire majority stake in Spacecom

The Hungarian telecommunications operator 4iG PLC signed a letter of intent with Spacecom for the acquisition of 51% of the company's shares. The acquisition values Spacecom at approx. \$127.5 million and would represent the fourth acquisition completed by 4iG this year once the transaction is finalised. 4iG projects to form a joint venture with Antenna Hungária and New Space Industries named CarpathiaSat with the objective of launching Hungary's first telecommunication satellite in 2024. CarapatiaSast will be responsible for the management of Spacecom's assets following the purchase.

Relativity Space closes \$650 million Series E funding round



Credit: Relativity Space

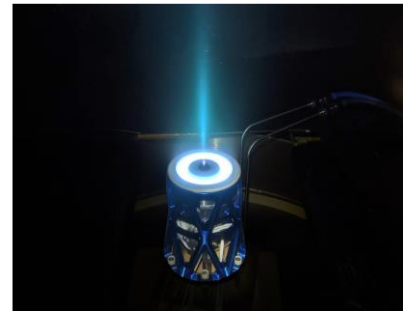
On June 8th, Relativity Space raised a \$650 million Series E equity funding round that was led by Fidelity Management & Research Company LLC. The funding round included the participation of other investors such as Blackrock, Centricus, Coatue and Tiger Global. The company plans to use the funding to scale up its activities related to the development of the necessary long-term infrastructure needed to produce its fully reusable Terran R launch vehicle, whose maiden launch is due in 2024. Relativity Space

projects the Terran R vehicle to be entirely 3D printed and to have the capacity to launch 20 tons in LEO as well as to provide transportation services to the Moon and Mars. The latest funding round follows the completion of a \$500 million Series D in 2020.



Astra to acquire Apollo Fusion for \$145 million

On June 7th, Astra and Apollo Fusion concluded an **agreement for the acquisition** of the latter in a deal valued at approx. \$145 million. The acquisition enables Astra to provide a more complete service for its launch solutions, which will now also include services beyond LEO through the use of Apollo Fusion's electric propulsion engines, thus increasing the company's total addressable market. In the framework of the agreement, Astra will acquire Apollo Fusion with a purchase price of \$50 million with an additional amount up to \$95 million coming in the form of potential earn-outs. Apollo Fusion recently **closed a number of contracts** with companies such as York Space and Saturn Satellite Networks as well as with the U.S. Air Force. The full transaction is projected to take place following the merger between Astra and the SPAC Holicity, which will make Astra a publicly traded company on the NASDAQ stock exchange.



Credit: Apollo Fusion

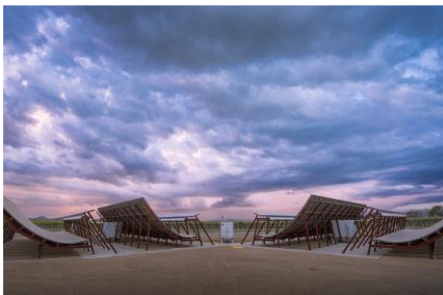
Shenzhen offers \$47 million in financial incentives to support satellite development activities

The Development and reform Commission of Shenzhen published an official document **launching a series of projects** aiming to transform the city into a hub for satellite manufacturing, in particular in the fields of communications, navigation and remote sensing. Companies bidding for the projects will be able to access up to \$47 million in financial incentives and subsidies per project, as the city's local government aims to support enterprises in the development of satellite systems for both high and low orbits. The document also outlines the importance of developing innovative applications for satellites and the commercialisation of satellites application terminals that can make use of China's BeiDou Navigation Satellites System. Shenzhen's push is part of a set of **efforts undertaken in the Greater Bay region**, of which it is part, as it currently develops its own satellite constellation.

Gilmour Space Technologies raises \$47 million in Series C funding round

On June 30th, Gilmour Space Technologies **completed a Series C funding round** valued at approx. \$47 million. The round was led by Fine Structure Ventures and represents one of the largest private equity investments raised by a space company in Australia. The company projects to use the new funding to support the development of its Eris small launch vehicle as well as the scale up of its activities and the expansion of its team. The company has **currently signed two contracts**, and projects to carry out the maiden flight of the Eris in 2023.

LeoLabs completes \$65 million Series B round



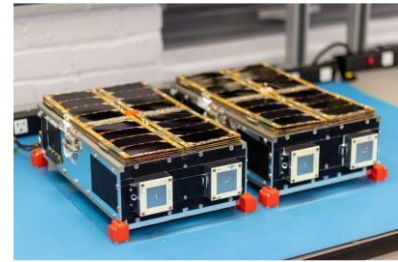
Credit: LeoLabs

The U.S. start-up LeoLabs closed its Series B funding round on June 3rd, **raising \$65 million** for the purpose of supporting the development of its LEO monitoring and collision detection solution. The round was led by Insight Partners and Velvet Sea Ventures and brings the total money raised by the company to over \$100 million. The start-up aims to use the new funds to scale-up its activities by expanding the number of radar sites as well as by enlarging its software and data science teams worldwide. The company's objective is to **provide additional data** for users looking to monitor debris and satellites in LEO in order to avoid dangerous in-orbit collisions. The solution is based on the operation its ground-based phased array radars, which enable the company to track objects as small as 2 centimetres across with complete orbital coverage.



Kepler Communications raises \$60 million Series B

The Canadian company closed a **\$60 million Series B funding round** with the aim of supporting the scale up of its on-orbit satellite communications network, bringing the total funding raised by Kepler Communications to over \$90 million. The round of financing was led by Tribe Capital and included the participation from new and existing investors such as Canaan Partners, IA Ventures and Costanoa Ventures. Following its Series B, the company will continue the development of its LEO satellite communication network capable of supporting activities on Earth but also able to bring connectivity services in-orbit. The new round of funding will also enable the company to scale up the size of its team and support the expansion of its activities, in particular following the completion of its vertical integration last year and its intention to establish new offices in the United States.



Credit: Kepler Communications

U.S. Export-Import Bank (EXIM) approves \$80.7 million financing in SpaceX and Hispasat

The Board of Directors of the U.S. EXIM approved the provision of **\$80.7 million in financing** to support SpaceX launch services and U.S. brokered services to the Spanish company Hispasat. Specifically, the EXIM financing will support the launch and initial in-orbit insurance for Hispasat's new Amazonas Nexus satellite, which is currently being developed by Thales Alenia Space and is expected to be launched in 2022 by SpaceX's Falcon 9. The transaction, which is projected to be in the form of either a direct loan or a loan guarantee, represents the first EXIM financing of a satellite industry-related export since 2015 due to the absence of a board quorum in the last years and follows the U.S. Congress' seven-year reauthorisation for the agency in 2019. EXIM financing represents a relevant source of credit for companies seeking long-term financing that may be unavailable from commercial lenders, as was the case for Hispasat.

Canada-based SkyWatch raises CAD20.9 million Series B

The Canadian start-up SkyWatch closed a Series B funding round on June 15th by **raising CAD20.9 million** with the aim of scaling up its Earth observation data platform. The funding round was led by the venture capital firm Drive Capital, and also included the participation from existing investors such as Space Capital, Golden Venture and Bullpen Capital. The company will use the new funding to support the growth of its operations as it prepares to rollout its new full-service data management platform called TerraStream. The new service aims to further bridge the gap between satellite start-ups and potential customers, as SkyWatch recently **formed a partnership with SatRevolution** for the provision of data management, ordering, processing and delivery services for the company's upcoming Stork-4 and Stork-5 missions through its TerraStream platform.

Phase Four closes \$26 million Series B

On June 11th, the U.S. start-up Phase Four **closed a \$26 million Series B** funding round led by venture capital firm New Science Ventures. The company aims to use the new funding to progress in the development of their Radio-Frequency Thruster and plasma propulsion systems. In particular, Phase Four is projected to scale up the production capacity of their Maxwell plasma propulsion engine following increased demand from a variety of actors in the last year. The company recently closed multiple contracts with the U.S. government **including with the Air Force** to adapt the capacities of the engine to alternative fuels such as iodine.



In other news

Orbion Space Technology raises \$20 million in Series B funding round: The round was led by Venture capital firm Inventus Capital Partners and also included the participation of Wakestream Ventures, Material impact and Beringea. The start-up expects to use the funding to scale-up the production capacity for its Aurora plasma thruster following the conclusion of a partnership with the U.S. DoD and an agreement with Blue Canyon Technologies in the last two years.

Launcher completes \$11.7 million Series A funding round: The small launcher start-up completed its Series A round, which was led by the accelerator Boot.VC and Max Haot, the company's founder. The company expects to use the new funds in order to expand its team and its facilities in Southern California as it continues to development of its small launch vehicle, the Launcher Light. Launcher expects to close a \$40 million Series B in early 2022.

Amazon Web Services selects 10 companies to participate in its space accelerator programme: The acceleration programme will be specifically focused on helping companies enhance their services by managing large amounts of data. Notably, two amongst the selected companies are European start-ups, with both Satellite Vu and D-Orbit set to take part in the acceleration programme.

OroraTech closes €5.8 million Series A: The round was led by Findus Venrute and Ananda Impact Ventures and also included the BayernKapital, SpaceTec Capital and Ingo Baumann. The company will use the funding to expand its international team and pursue the development of the first satellites in its planned nanosatellite constellation, with the inaugural launch of their payload currently planned on a Spire 6U nanosatellite in 2021. OroraTech projects to launch over 100 nanosatellites by 2026.

Hydrosat raises \$5 million Seed round: The round was led by Cultivation Capital, and included the participation of investors such as Techstars, Freeflow Ventures and Industrious Ventures. Hydrosat projects to use the new funding to support the development of its planned infrared satellite constellation. Following its inaugural mission expected in 2022, Hydrosat plans to launch an additional 16 satellites to form the rest of its constellation, which will have the objective of providing a commercial thermal infrared data and analytics solution to potential customers, particularly in the field of agriculture.

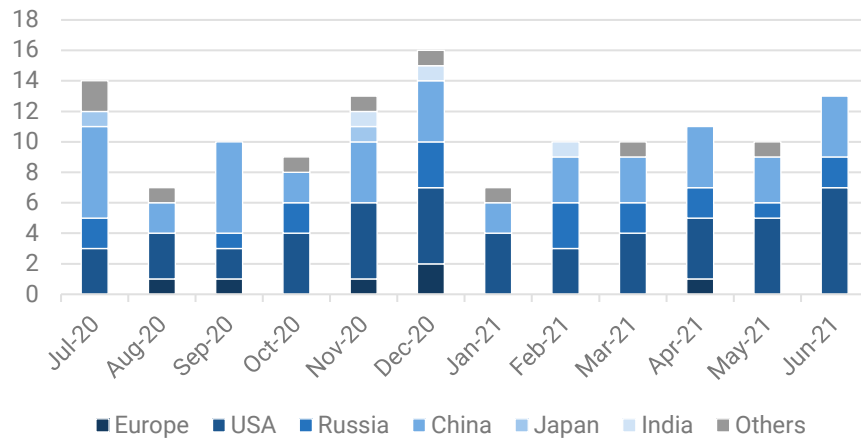


LAUNCHES & SATELLITES

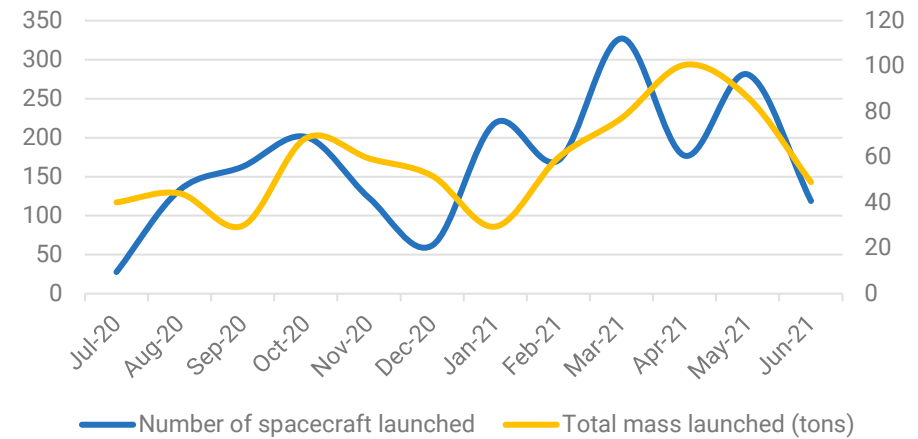
Global space activity statistics

June 2021	USA	Russia	China	Total
Number of launches	7	2	4	13
Number of spacecrafts launched	107	2	10	119
Mass launched (in kg)	20 158.7	13 780	15 079	49 017.7

Launch activity over the year



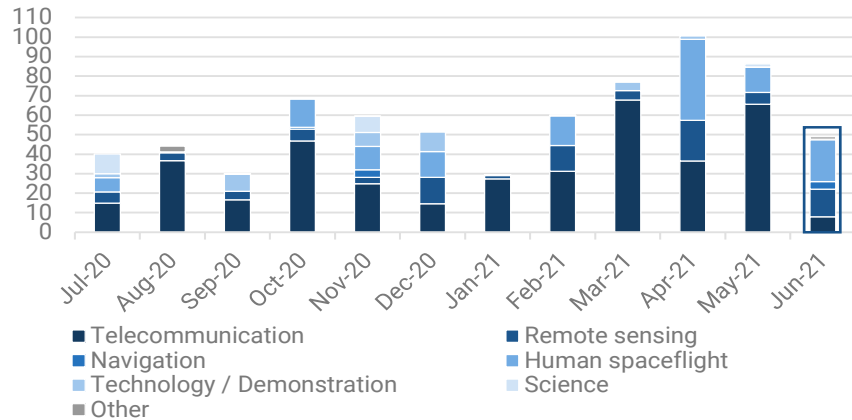
Evolution of the number of launches per launch country



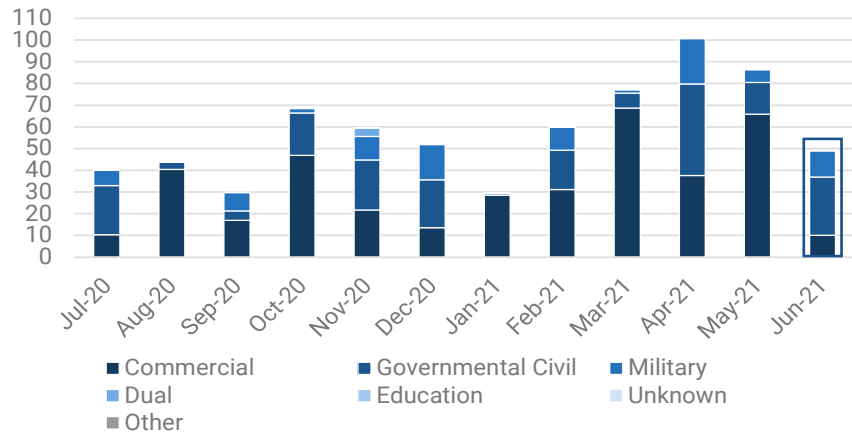
Evolution of launch activity over the year 2020-2021



Satellite missions and markets



Evolution of the total mass launched (tons) per mission (July 2020-June 2021)



Evolution of the total mass launched (tons), per market (July 2020-June 2021)

June 2021	Telecom	Remote sensing	Navigation	Human Spaceflight	Tech/ Demo	Science	Other
Europe	26	378			63		106
USA	7791.2	291	3880	6000	285.5		1136
Russia		6500		7280			
China	50	6385		8082	20	42	
Others	16	671			14		1

Total mass (kg) launched by mission and customer country

June 2021	Commercial	Governmental Civil	Military	Education
Europe	540	27	6	
USA	8685.7	6012	4684	2
Russia		7280	6500	
China	92	13 567	900	20
Others	687	4	10	1

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
02/06/2021	China	CZ-3B/G3	FY 4B	National Satellite Meteorological Center	China	SAST	China	5300	Meteorology	Governmental Civil
03/06/2021	USA	Falcon-9 v1.2 (Block 5)	Dragon CRS-22	NASA	USA	SpaceX	USA	4620	Cargo Transfer	Governmental Civil
			iROSA (2B & 4B)	NASA	USA	Deployable Space Systems	USA	690 (each)	Space Station Infrastructure	Governmental Civil
			MIR-SAT 1	Mauritius Research and Innovation Council	Mauritius	Mauritius Research and Innovation Council	Mauritius	1	Earth Observation	Governmental Civil
			RamSat	Robertsville Middle School	USA	Robertsville Middle School	USA	2	Tech / Demo	Education
			SOAR	University of Manchester	United Kingdom	GOMSpace	Denmark	2	Tech / Demo	Governmental Civil
06/06/2021	USA	Falcon-9 v1.2 (Block 5)	SXM 8	SiriusXM	USA	Maxar	USA	7000	Telecommunication	Commercial
11/06/2021	China	CZ-2D(2)	Beijing 3	21AT	Singapore	CAST	China	500	Earth Observation	Commercial
			Haisi 2	Xiamen University	China	CAST	China	185	Earth Observation	Governmental Civil
			Taikong Shiyan 1 / TKS01-TJ	University of Aerospace Engineering	China	University of Aerospace Engineering	China	20	Tech / Demo	Education
			Yangwang 1	Origin Space	China	Shenzhen Aerospace Dongfanghong HIT Satellite Ltd.	China	42	Astronomy	Commercial
13/06/2021	USA	Pegasus-XL	Odyssey / TacRL-2	US Space Force	USA	Air Force Research Laboratory	USA	200	SSA	Military
15/06/2021	USA	Minotaur-1	USA (316, 317 & 318)	NRO	USA	Unknown (USA, Private)	USA	150 (each)	Unknown	Military
17/06/2021	USA	Falcon-9 v1.2 (Block 5)	GPS-3 5	US Space Force	USA	Lockheed Martin	USA	3880	Navigation	Military
17/06/2021	China	CZ-2F/G	Shenzhou 12	CNSA	China	CNSA	China	8082	Crew Transfer	Governmental Civil
18/06/2021	China	CZ-2C(3)	Tianqi 14	Guodian Gaoke	China	SAST	China	50	Telecommunication	Commercial
			Yaogan 30-09 (-01, -02 & -03)	People's Liberation Army	China	CAS	China	300 (each)	Signal Intelligence	Military
25/06/2021	Russia	Soyuz-2-1b	Kosmos 2550 / Pion-NKS 1	Russian Aerospace Forces	Russia	Progress Rocket Space Center	Russia	6500	Earth Observation	Military
29/06/2021	Russia	Soyuz-2-1a	Progress-MS 17	Roscosmos	Russia	RKK Energia	Russia	7280	Cargo Transfer	Governmental Civil
30/06/2021	USA	Falcon-9 v1.2 (Block 5)	ARTHUR 1	Aerospacelab	Belgium	Aerospacelab	Belgium	20	Tech / Demo	Commercial
			Astrocast (5 satellites)	Astrocast	Switzerland	Astrocast	Switzerland	4 (each)	Telecommunication	Commercial



Capella 5	Capella Space	USA	Capella Space	USA	112	Earth Observation	Commercial
Centauri 4	Fleet Space Technologies	Australia	Tyvak Nano-Satellite Systems	USA	8	Telecommunication	Commercial
D2 / AtlaCom-1	HyperActive	International	NanoAvionics	Lithuania	8	Tech / Demo	Commercial
EG 3	EchoStar Global	Australia	Tyvak Nano-Satellite Systems	USA	8	Telecommunication	Commercial
Faraday Phoenix	InSpace	United Kingdom	GOMSpace	Denmark	10	Tech / Demo	Commercial
Ghalib	Marshal Intech	United Arab Emirates	ISIS	Netherlands	3	Tech / Demo	Commercial
GNOMES 2	PlanetIQ	USA	Blue Canyon Technology	USA	30	Meteorology	Commercial
Hawk (3A, 3B & 3C)	HawkEye 360	USA	UTIAS/SFL	Canada	25 (each)	Signal Intelligence	Commercial
ICEYE (4 satellites)	ICEYE	Finland	ICEYE	Finland	85 (each)	Earth Observation	Commercial
ION-SCV 3	D-Orbit	Italy	D-Orbit	Italy	100	Other	Commercial
KSF (4 satellites)	Kleos Space	Luxembourg	ISIS	Netherlands	8 (each)	Signal Intelligence	Commercial
Lemur-2 (6 satellites)	Spire	USA	Spire	USA	4 (each)	Earth Observation	Commercial
LINCS (A & B)	SDA	USA	General Atomics	USA	15 (each)	Tech / Demo	Military
Lynk 06	Lynk	USA	Lynk	USA	60	Tech / Demo	Commercial
Mandrake (2A & 2B)	DARPA	USA	Astro Digital	USA	50 (each)	Tech / Demo	Military
NAPA 2	Royal Thai Air Force	Thailand	ISIS	Netherlands	10	Earth Observation	Military
Neptuno	Deimos	Spain	Deimos	Spain	4	Tech / Demo	Governmental Civil
ÑuSat (4 satellites)	Satellogic SA	Argentina	Satellogic SA	Argentina	40 (each)	Earth Observation	Commercial
PACE-1	NASA	USA	NASA	USA	8	Tech / Demo	Governmental Civil
Painani-II	CICESE	Mexico	CICESE	Mexico	3	Tech / Demo	Governmental Civil
QMR-KWT	"Code in Space" initiative	Kuwait	Orbital Space	United Arab Emirates	1	Radio Amateur	Education
Shasta	Astro Digital	USA	Astro Digital	USA	22.5	Tech / Demo	Commercial
Sherpa-FX 2	Spaceflight Inc.	USA	Spaceflight Inc.	USA	120	Other	Commercial
Sherpa-LTE 1	Spaceflight Inc.	USA	Spaceflight Inc.	USA	203	Other	Commercial
SpaceBEE (28 satellites)	Swarm Technologies	USA	Swarm Technologies	USA	0.4 (each)	Telecommunication	Commercial



			Spartan	EnduroSat	Bulgaria	EnduroSat	Bulgaria	6	Other	Commercial
			Starlink (3 satellites)	SpaceX	USA	SpaceX	USA	260 (each)	Telecommunication	Commercial
			Tenzing	Astro Digital	USA	Astro Digital	USA	35	Tech / Demo	Commercial
			Tiger-2	OQ Technology	Luxembourg	NanoAvionics	Lithuania	6	Telecommunication	Commercial
			TROPICS Pathfinder	NASA	USA	Blue Canyon Technology	USA	4	Tech / Demo	Governmental Civil
			TUBIN	TU Berlin	Germany	TU Berlin	Germany	17	Tech / Demo	Governmental Civil
			Umbra-SAR 2001	Umbra Lab	USA	Umbra Lab	USA	50	Earth Observation	Commercial
			W-Cube	Reaktor Space Lab Ltd	Finland	Reaktor Space Lab Ltd	Finland	4	Tech / Demo	Governmental Civil
			YAM 2	Loft Orbital	USA	Blue Canyon Technology	USA	80	Other	Commercial
			YAM 3	Loft Orbital	USA	LeoStella	USA	83	Other	Commercial
30/06/2021	USA	LauncherOne	Brik-2	Royal Netherlands Air Force	Netherlands	ISIS	Netherlands	6	Tech / Demo	Military
			STORK (4 & 5)	SatRevolution SA	Poland	SatRevolution SA	Poland	3 (each)	Earth Observation	Commercial
			STP-27VPA 1	US Army SMDC	USA	US Army SMDC	USA	6	Tech / Demo	Military
			STP-27VPA 2	NIWC	USA	NIWC	USA	6	Tech / Demo	Military
			STP-27VPA 3	Missile Defense Agency	USA	Missile Defense Agency	USA	6	Tech / Demo	Military
			STP-27VPA 4	Missile Defense Agency	USA	Missile Defense Agency	USA	6	Tech / Demo	Military



Launch Highlights

First launch of a Pegasus-XL since 2019



Credit: Northrop Grumman

On June 13th, Northrop Grumman launched a satellite for the U.S. Space Force, which will conduct space domain awareness missions. The launch was remarkable for several reasons. First, the launcher used was a Pegasus-XL, a rocket launched from under a plane that had not flown for more than 18 months. Second, the satellite was launched in the framework of the Tactical Responsive Launch-2 (TacRL-2) mission. The objective of this kind of missions is to rapidly send a payload in orbit to demonstrate launch flexibility and agility. Therefore, the satellite was integrated with the rocket and the aircraft in **only 21 days**. TacRL-2 was also the first mission of the Space and Missile Systems Center's Space Safari Program Office, a new office created in June 2021.

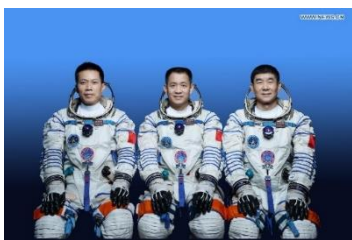
SpaceX launches a GPS spacecraft with a reused booster

On June 17th, Space X launched the fifth satellite of the GPS III constellation, built by Lockheed Martin for the U.S. Space Force. For the first time, the company was authorised to **use a previously flown Falcon 9 first stage** on a national security mission. Indeed, the military has been working since 2016 on the certification of reused boosters for national security launches. The booster used by SpaceX was already used to fly another GPS III satellite in November 2020. Using this specific booster was explicitly required by the Space Force, but **it will not be the case for future launches**, as first stages used in commercial missions may be reemployed. Finally, for the next GPS III launch, the company will be able to offer a booster that has flown more than twice.



Credit: Lockheed Martin

China continues work on its space station



Credit: Xu Bu/Xinhua

On June 16th, China **launched Shenzhou 12**, its latest crewed space mission, which reached in six hours and a half the new space station (Tianhe) put in orbit by the country in April and supplied with cargo in May. The crew is composed of three astronauts, including two veterans, and will remain onboard the station for three months. This will be the longest stay in space for Chinese taikonauts since the start of the country's space programme. Several spacewalks are also planned during the duration of the mission.

An active end of the month

On June 30th, two launches were conducted from the United States. First, Virgin Orbit sent seven satellites in orbit with its LauncherOne rocket, thus carrying out its second successful flight and its first commercial mission. In the evening, SpaceX launched 88 satellites in the second mission of its rideshare programme, called Transporter-2. Among others, the mission transported the first satellites of the Space development Agency, an organisation of the Department of Defense created in 2019, as well as the first satellite of Kuwait. In addition, this mission displayed a high number of spacecraft dedicated to deploy other satellites in specific orbits or to host several payloads on their platforms, thus witnessing the development of the "mission-as-a-service" concept.

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