



ESPI

European Space Policy Institute

ESPI Insights

Space Sector Watch



Issue 18
July 2021

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HISTORICAL MILESTONE FOR COMMERCIAL HUMAN SPACEFLIGHT



Dear Friends of ESPI,

The month of July has been particularly eventful in the area of commercial human spaceflights. On July 12th, **Virgin Galactic completed the first fully crewed spaceflight** with company's founder Richard Branson and five members of his team onboard. The rocketship SpaceShipTwo was launched from the WhiteKnightTwo aircraft, and landed later at Spaceport America, in New Mexico after a four minutes flight in orbit. The mission named Unity 22 was the 22nd test flight for Virgin Galactic, and included a **NASA-supported science experiment**.

A few days later, on July 20th, Blue Origin carried out **New Shepard's first crewed launch** from its launch site One in West Texas. Onboard the RSS First Step crew capsule were company's founder Jeff Bezos and three passengers: Mark Bezos, his brother, Wally Funk, historic figure of American aviation, and Oliver Daemen, who was the second winning bidder of the June 12th auction, and who took the place of the first bidder due to scheduling conflicts of the latter. The winning bidder's purchasing price for the seat (\$28 million) was donated to the **Club for the Future foundation**, which distributed \$1 million grants to 19 space-based non-profit organisations. For this first flight, Blue Origin operated the New Shepard under a suborbital reusable crewed launch vehicle license which allowed, for the first time, the flight of a private passenger having purchased a commercial ticket. Blue Origin has already planned two additional crewed flights by the end of the year.

The altitude reached by the two companies fed the international debate about the limits of space. Blue Origin reached a peak altitude of approx. 107 km, passing the Kármán Line (100 km) which is one of the most internationally recognised boundaries of space, while Virgin Galactic reached approx. 86 km, beyond the Air Force's and NASA's conventional "edge of space" (80 km). The two flights also led to some controversy about the recognition of passengers as "Astronauts". Ultimately, the **FAA updated the rules** clarifying the title requirements, which include to be part of a flight crew and contributing to flight safety.

Anyhow, July 2021 will certainly be remembered as a milestone in the history of commercial human spaceflight. The future of this domain is still uncertain but could very well be a game changer for the space industry, in particular in the field of access to space, should it follow somehow the path of commercial air transportation from luxurious experiences to affordable services. There are major differences between the two sectors of course, which boast different applications, but some parallel can be drawn and a question asked: how might the commercial human spaceflight successfully expand to mass markets following these first demonstrations? It took years, even decades, for the commercial airline industry to do so after the first scheduled passenger airline service operated between St. Petersburg and Tampa, Florida, in 1914 (the company went bankrupt a few months after actually). Many important technical, business and regulatory questions remain but the eventuality of a flourishing commercial human spaceflight industry shifting our approach to access to space is now one step closer to reality. The maturation of the commercial human spaceflight market will raise questions related to the intensive exploitation of outer space resources, safety and environmental concerns, regulation and taxation of such commercial services, etc... Some more critical issues will need to be addressed regarding potential security or strategic implications, and Europe will have, like it or not, to clarify its position in the field of human spaceflight, be it for commercial, exploration or scientific purposes.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'JJ Tortora', written over a white background.

Jean-Jacques Tortora

Director of ESPI



POLICY & PROGRAMMES

ESA signs €118.8 million contract with Avio for the development of new Vega-E

On July 21st, ESA signed a contract worth €118.8 million with Avio to initiate the development of the Vega-E launcher. Vega-E represents an evolution in the design of Europe's Vega medium-lift rocket and is expected to carry-out its maiden flights in 2025. ESA aims to increase the competitiveness of the Vega-C launcher in terms of both capacity and cost of launch through this new design, which includes a liquid oxygen–methane cryogenic upper stage set to replace the last two stages present in Vega-C's design. Italy remains the major contributor to the project, as it accounts for **approx. 56% of the agreed funding** for the Vega Evolution programme at the 2019 ESA Ministerial conference, with Romania and Belgium representing the second and third biggest contributors.



Credit: ESA

European Commission sets European Defence Fund in motion and awards EDIDP contracts

European Commission launches first calls under European Defence Fund

The European Commission **officially kick-started activities** under its newly created European Defence Fund on July 1st by issuing 23 new calls for proposals following the adoption of its annual working plan. The EDF's first working plan sets a budget of €1.2 billion for the funding of projects undertaken in the scope of its annual call for proposals. The first 23 calls include two space projects for which the Commission is considering a contribution of up to €50 million each. The two calls address the resilience of space-based capacities in contested environments. The first call concerns **NAVWAR surveillance systems** while the second relates to technologies for **resilient satellite communications** against jamming.

European Commission awards three contracts for space projects under EDIDP

In addition, the Commission also **awarded three contracts** worth a total of €22.5 million for the 2021 EDIDP programme. The EDIDP is the EDF's precursor programme and includes 26 projects in 2021. The three space projects were selected under the "Space Situational Awareness and Early Warning" category of the programme and will receive €7.5 million in funding each. The first project, led by ArianeGroup, is named SAURON and aims to support the development of sensors capable of identifying satellites in orbit. The second project, INTEGRAL, is coordinated by Vitrociset and has the objective of creating a software to enhance cooperation between national operational space surveillance centres. The third project is named ODIN'S EYE and concerns space-based missile early warning. The three projects are expected to run until 2024 and will be expanded upon in future EDF calls.

EUMETSAT signs €735 million agreement with European Commission and invests €58 million



Credit: ESA

On the 23rd of July, following an **agreement signed with the European Commission**, EUMETSAT is set to become the largest operator of the Copernicus programme's Sentinel satellite mission (Copernicus 2.0 agreement). The 7-year, €735 million Contribution agreement will entrust EUMETSAT with continued operations and utilization of the existing Copernicus Sentinel satellites 3, 4, 5 and 6. The Copernicus 2.0 agreement follows an approval by the EUMETSAT Council for a **€58 million investment** to be carried out between 2022 and 2027 to develop innovative approaches targeted at translating satellite data into services providing societal benefits.



European STM Conference takes place under new Slovenian presidency of the EU Council

As part of the **EU roadmap** for the work of the EU Council on Space Traffic Management (STM), the European STM Conference took place on July 7th. The conference had the objective of advancing the development of a unified European position on STM, in line with the European Space Programme and ESA's Space Safety Programme, and **endorsed a non-binding document** drafted by the Slovenian presidency of the EU Council. The document notably emphasized the importance of STM for the long-term sustainability of space activities and the need for a common approach from the ESA, the EU and its Member States to address global challenges related to STMs and participate in international discussions. In addition, the document also highlights the necessity for a European contribution to the development of norms and standards for STMs as a means to promote European competitiveness and preserve European interests in the access and use of space.

Jeff Bezos offers to cover \$2 billion in HLS contract costs and GAO denies protests



Credit: Blue Origin

On July 26th, in a **letter addressed to Nasa administrator Bill Nelson**, Blue Origin founder Jeff Bezos offered to wave up to \$2 billion dollars of Human Landing System (HLS) development costs as well as cover the cost of a demonstration mission in case the company were to be awarded the contract. The letter follows an unsuccessful bid led by Blue Origin and its National Team for the award of a contract for the development of a moon lander, which was eventually awarded to

SpaceX in April. Although the Agency initially planned to award two contracts, only Space X was selected as HLS contractor due to budgetary constraints. Blue Origin's current offer aims to bridge the funding shortfall with the objective of persuading NASA to award a second HLS contract to the company.

In parallel, the U.S. Government Accounting Office (GAO) **denied the protests** that were filed by Blue Origin and Dynetics in April regarding the HLS contract awards. In its statement, the GAO notably establishes that NASA's contract award did not violate procurement law or regulation and that the agency did not act improperly in offering a single award. The decision likely means that Space X will be able to resume work on the HLS, as the agency looks to **potentially receive additional budget** from Congress.

NASA offers contracts up to \$45 million to reduce risks related to Human Landing Systems

On July 1st, NASA **issued a new solicitation** offering contracts valued up to \$45 million to commercial actors for the supply of various services aiming to support the agency in the development of its Human Landing System (HLS). Specifically, the agency aims to partner with members of the industry to mature designs and conduct engineering and technology tasks seeking to reduce the risks related to the operation of the HLS. In addition, NASA plans to receive recommendations from commercial actors pertaining to its draft sustaining HLS requirements and its safety standards. The work accomplished in the framework of the solicitation will **precede the issuance** of future HLS Sustaining mission capability procurements on a recurring basis.

NASA and Northrop Grumman expand collaboration

NASA and Northrop Grumman **finalised a contract valued at \$935 million** for the development and delivery of the Lunar Gateway's Habitation and Logistics Outpost (HALO). The company has previously worked on the Preliminary Design Review of HALO under a contract awarded in June 2020. The HALO's design will be based on Northrop Grumman's Cygnus spacecraft. The module is set to be launched in November 2024 aboard a SpaceX Falcon Heavy rocket. NASA and Northrop Grumman are also **upgrading the current Solid Rocket Boosters (SRBs)** for the Space Launch System (SLS) Block 2 vehicle in the framework of the SLS Booster Obsolescence and Life Extension (BOLE) program.



In other news

NASA selects SpaceX 's Falcon Heavy to launch Europa Clipper mission: The launch service contract is valued at approx. \$178 million, with the agency expecting to carry out the mission's launch in October 2024. The decision to opt for a commercial launch vehicle rose following the emergence in 2020 of potential hardware compatibility issues between the Space Launch System (SLS) and Europa Clipper.

ESA selects Thales Alenia Space to conduct study for EnVision orbiter: The company was selected by ESA for a B1 preliminary study phase for mission for EnVision Venus orbiter which is the fifth medium class mission within the agency's Cosmic Vision plan. Thales Alenia Space selected OHB as a subcontractor to define the structure and thermal system for the orbiter.

ESA appoints QinetiQ for the development of a demonstrator: ESA has appointed QinetiQ for the delivery of a new satellite in the scope of the EU Horizon 2020 IOD/IOV initiative. The new satellite will be based on the latest generation QinetiQ's PROBA platform and will host up to thirteen onboard experiments.

UK announces new fund to address orbital congestion and space debris: A new joint initiative between the UK Space Agency's National Space Technology Programme (NSTP) and the Space, Surveillance and Tracking Programme (SST) will dedicate £1.2 million to fund technologies addressing the risks of collision in space. UK companies and research organisations can bid for up to £200,000.

Sierra Lobo wins NASA contract for test and operations support: NASA awarded the five-year Test Evaluation and Support Team 3 (TEST3) contract to Sierra Lobo, Inc for the White Sands Test Facility in New Mexico. Sierra Lobo will provide expertise, as well as maintain infrastructures necessary for the testing of propulsion hardware and propellants, among other things. The maximum value of the contract is \$400 million.

France and Luxembourg sign Letter of Intent on exploration and space resources: CNES, the Luxembourg Space Agency (LSA), ESRIC, and Air Liquide signed a quadripartite Letter of Intent to hold discussions on future projects related to space exploration and in situ resource utilisation. The four organisations committed to working together to develop R&T activities in these fields.

The German Armed Forces choose Polaris to investigate applications of its Aurora spaceplane: The capabilities of the reusable Aurora vehicle will be tested and validated by the German start-up not only in defense activities but also in commercial suborbital and hypersonic missions. The project is known as RDRS (Rapid Deployable Reconnaissance System) and is based on a contract lasting four months and valued at €250 000.

NASA chooses Moog for its VIPER mission: The U.S.-based company will be responsible with powering and controlling the rover and some equipment through its Integrated Avionics Unit (IAU) and Spacecraft Energization and Power Interfacing Assembly (SEPIA). Additionally, Moog will also provide radiation-tolerant image processing and storage that will allow VIPER to move on the Moon's surface.

JAXA and NASA agree to cooperate on launch and data exchange for two JAXA CubeSats : The two cubesats covered in the MoU are the EQUULEUS, dedicated to conducting science missions concerning Earth's plasmasphere, and the OMOTENASHI which aims to demonstrate the feasibility of ultra-small spacecraft landing technology and monitor near-Moon radiations. The satellites will be launched aboard the Artemis I mission.



INDUSTRY & INNOVATION

Thales Alenia Space and Axiom Space sign €110 million contract for delivery of two modules

Thales Alenia Space and Axiom Space **have finalised an agreement** for the design, manufacture and delivery of two pressurised modules that will be part of the future Axiom Space Station. The contract for the development of the two modules is valued at approx. €110 million and their launch is scheduled for 2024 and 2025 respectively. The modules can accommodate up to four people and are expected to dock with the ISS before eventually detaching to form part of a new commercial station operated by Axiom in LEO. In addition to the development of the primary structures, Thales Alenia Space will also be responsible for the delivery of the Micrometeoroid & Debris Protection System of the modules. In occasion of the contract signing, the company **ratified a Memorandum of Collaboration** with the Italian Air Force aiming to reinforce initiatives related to research activities undertaken in microgravity.



Credit: Thales Group

Leonardo signs contract to supply hydrogen atomic clocks to Galileo Second Generation

Leonardo was selected by the European Commission and ESA **to deliver Passive Hydrogen Maser (PHM)**, the company's hydrogen atomic clocks, for Galileo Second Generation. Within the scope of the award, the company will supply two atomic clocks for each new satellite, with the first twelve units scheduled for delivery in 2023. Leonardo was a key partner in the development of the Galileo First Generation, and its atomic clocks are core technological elements of the European navigation system, allowing for the most accurate timing capabilities for in-orbit operations in the market today. Furthermore, according to the new contract, Leonardo will also assist and advice EUSPA on instruments operations.

SES leads consortium to develop satellite-terrestrial quantum infrastructure in Luxembourg

SES **was selected as prime contractor** for the development of a satellite-terrestrial quantum infrastructure as part of Luxembourg's Quantum Communications Infrastructure project (LuxQCI). The LuxQCI is a project currently coordinated by Luxembourg's Ministry of State with participation from the Luxembourg Space Agency and ESA under the country's LuxIMPULSE programme. The project's objective is that of enhancing Luxembourg's secure connection systems, in particular through the development of infrastructures and systems capable of quantum key distribution. LuxQCI will be an integral part of the European Quantum Communication Infrastructure (EuroQCI) initiative initiated by the Commission.

Three industrial teams selected to study nuclear thermal propulsion design



Credit: NASA

NASA and the U.S. Department of Energy (DOE) **awarded contracts to three teams**, to study reactor design concepts for nuclear thermal propulsion. The aim is to boost research towards nuclear thermal propulsion (NTP) systems. The selected teams are led respectively by BWX Technologies, General Atomics Electromagnetic Systems, and Ultra Safe Nuclear Technologies. Each contract has a duration of 1 year and is valued at approx. \$5 million each. The U.S. national laboratory for nuclear energy

research and development Idaho National Laboratory (INL) of the DOE will oversee delivering the contracts, reviewing the proposals and formulating recommendations to NASA to create the basis for future design and development of nuclear technologies and systems.



e-GEOS and ImageSat International partner to create SAR-Electro Optical constellation

e-GEOS and ImageSat International (ISI) **established a strategic alliance** to create a commercial High Revisit-Ultra High-Resolution Electro Optical-SAR satellite constellation. Based on the agreement, the constellation will be formed of eight satellites which will include five COSMO-SkyMed first- and second-generation dual use SAR satellites, and three of EROS Next Generation Electro Optical Ultra High-performance satellites. As a result, e-GEOS and ISI's current and future customers will benefit from different sensing technologies and higher resolution imaging capabilities in all environmental circumstances. The two companies aim to boost their competitiveness by creating the world's most capable commercial constellation of this kind and meeting the evolving needs of the market.



Credit: Telespazio

OQ Technology launches first European 5G LEO Test Centre and secures test spectrum licence

OQ Technology established the **first European 5G Satellite Test Centre (STC)** for LEO satellites in Leudelange, Luxembourg. The Luxembourg-based company will use the STC to carry out all the required testing of its 5G IoT devices and of satellite performances targeting 5G frequencies. The STC is also expected to be exploited by other companies that wish to test and validate their IoT prototypes, as well as test possible interferences between different networks of mobile and terrestrial operators. Furthermore, OQ Technology secured an experimental 5G test spectrum licence grant from the Luxembourg Ministry of Media and Communication to access critical satellite 5G frequencies in the country. With the new licence, the Dubai and Luxembourg-based company is planning to test and enhance its portfolio of 5G IoT devices and its satellites' cell-tower 5G software stack.

Spacecom signs extension deals for AMOS satellites

Spacecom **signed two extension deals** with D.B.S. Satellite Services and AsiaSAT. Based on the first extension deal valued \$14 million, DHT will continue operations from AMOS-7 and AMOS-3 satellites, and Yes order backlog is supposed to increase to \$100 million as a result. The second extension concerns a lease agreement that Spacecom had concluded with AsiaSAT in 2016. It provides for a two-year extension until 2024 with a new annual lease fee amounting to \$14 million, which represents a \$8 million reduction on the original contract.

Inmarsat to build €100 million ORCHESTRA integrated communication system



Credit: Inmarsat

On July 29, Inmarsat stated its intent to **build an integrated communication system** combining the capacities of its current GEO fleet of satellites with terrestrial 5G and a projected LEO constellation in the framework of a five-year (2021-2026) plan. The UK-based operator expects to launch approx. 150-175 satellites to make up its LEO constellation and stated that the total investment necessary to develop its ORCHESTRA system is equal to roughly €100 million. The communication system will be the first to include both GEO and LEO satellites with terrestrial 5G in an integrated solution as Inmarsat projects to deliver high-performance connectivity specifically to global mobility customers in various industries.



In other news

Airbus to deliver solar panels for Masten Space System's XL-1 lunar lander: The company will deliver a solution based on its Sparkwing solar panels to charge the vehicle's power system during transit and operations on the Moon. The lander is scheduled for landing on the lunar South Pole in 2023.

Infostellar and Amazon Web Services (AWS) collaborate to increase benefits for satellite operators: The partnership entails the integration of AWS Ground Station into Infostellar's StellarStation mission control software. StellarStation is the Tokyo-based company's cloud-based platform that allows operators to access ground stations of different service providers. As a result of this new integration, the two companies aim to help satellite operators provide customers with faster and easier communications, downlink, and processing of data.

D-Orbit signs contract with ESA Under the Boost! Programme: Under the new contract, D-Orbit is set to offer end-to-end transportation services and increase opportunities for small satellite companies. D-Orbit will establish a satellite assembly, integration, and testing facility at Spaceport Cornwall Centre in the UK and work with a wide range of UK-based launch service providers. D-Orbit plans to expand its collaboration to other European-based launch service providers.

Astroscale and Mitsubishi to collaborate on development of space debris technology: Astroscale signed a MoU with Mitsubishi Heavy Industries to address growing concerns surrounding orbital debris. The joint effort seeks to address the problem of rocket upper stages left in orbit and to create technologies to support sustainability in space.

Boeing and OHB's MT Aerospace extend partnership and explore new collaboration opportunities: The aim of the new MoU, is the expansion and diversification of MT Aerospace's supplier activities for Boeing commercial, defence and space programmes. Furthermore, the two companies seek to discuss new collaborations, such as the design and manufacturing of parts for commercial satellites built by Boeing and possibly of the core stage of NASA's Space Launch System (SLS).

CYSEC and D-Orbit partner to perform in-orbit demonstration of ARCA Space: The Swiss cybersecurity company CYSEC selected D-Orbit to test its ARCA Space solution during the company's Ion Satellite Carrier mission in December. ARCA Space, is CYSEC's satellite communication end-to-end protection solution which covers both ground and space segments.

LEOcloud and Ramon.Space launch new collaboration to develop satellite-based cloud computing: The new partnership will offer LEOcloud's commercial, government and military customers cloud edge computing services. LEOcloud's LEO constellation is indeed expected to gain new features by employing Ramon.Space's solutions as computing infrastructure and having access to all its performances.

Agile Defense receives contract to provide enterprise IT support services to U.S. institutional actors: The Virginia-based company aims to foster innovation through information technology and support the U.S. Army Program Executive Office Missiles & Space (PEO MS) and its offices, as well as several external organisations in the Department of Defense's community. The new collaboration is the result of a contract worth more than \$33 million.

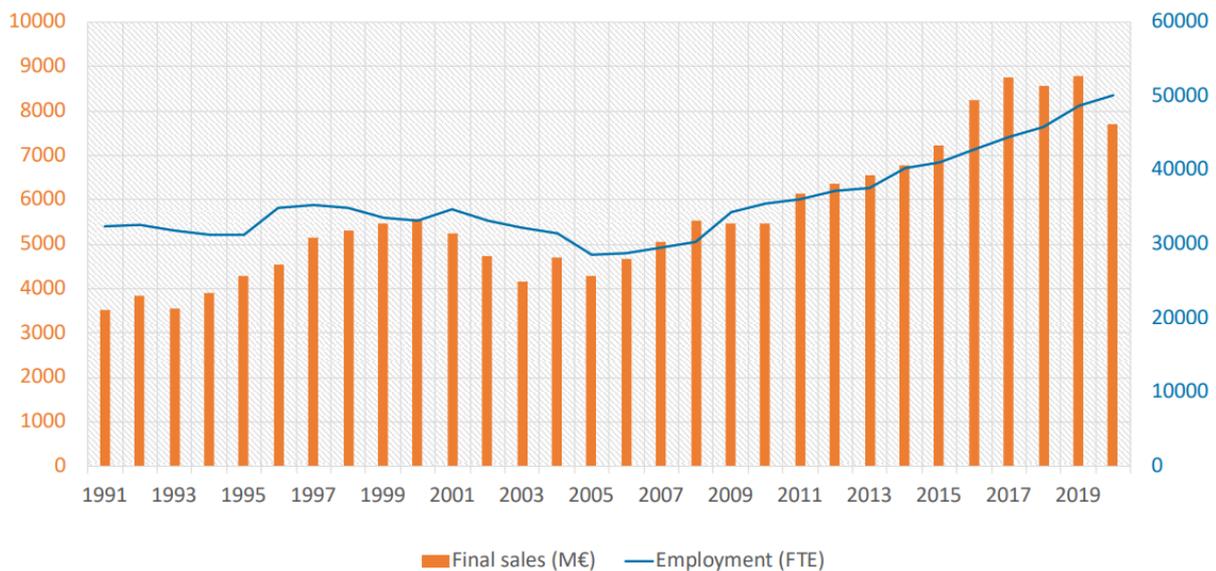
GMV and Hispasat sign a series of contracts for next generation of satellites Amazonas Nexus: In the scope of the contracts, GMV will provide several elements and systems for Hispasat's Amazonas Nexus' ground segment as well as carry out the installation a new ground station in Rio de Janeiro.



ECONOMY & BUSINESS

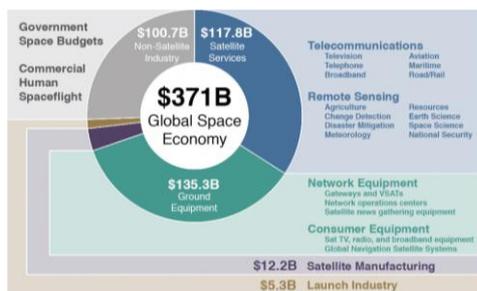
Eurospace releases space industry Facts & Figures 2020

Eurospace released the 25th edition of their annual Facts & Figures. The report has been published since 1996 and provides an annual review of the state of the space industry in Europe including but not limited to industrial statistics, surveys, consolidated methods, chronological series, and economic indicators. In 2020, the facts & figures covered in depth the difficult economic context created by the Covid-19 crisis and its impact on the European space industry. Specifically, in 2020, the European space industry registered an unprecedented drop of sales worth €1 billion representing a total decrease of 13% compared to 2019. Out of this, the most affected segments were ESA's business (€500 million loss) driven by a loss in revenues from launchers, EO and Navigation as well as commercial business loss (€400 million). On the other hand, direct industry employment went up by 2.8% in 2020, notably driven by the New Space segment.



European space industry sales and employment (Credit: Eurospace facts & figures annual release – copyright by Eurospace)

SIA and Bryce Tech release State of the Satellite Industry 2021 report



Credit: Bryce Tech

The Satellite Industry Association and Bryce Tech have issued their yearly **State of the Satellite Industry report** which highlights developments in the satellite industry in 2020. The report notably highlights the growth in size of the space economy compared to 2019, with Bryce/SIA estimating the global size of the space economy at \$371 billion which represents an approx. 1.4% year-on-year increase. According to SIA/Bryce, the growth was driven by a rise in value of the ground equipment and non-satellite industry segments, which

have offset a decrease in the volume of satellite services in 2020. The size of the satellite industry however remained the same, representing an estimated \$271 billion or 73% of the total. Ground equipment and satellite services constituted the biggest share of the satellite industry representing 50% and 44% of the total respectively. The report also highlights the record number of satellites launched last year with 3 371 satellites in orbit around the Earth in 2020, compared to roughly 2 124 in 2019.



Space in Africa releases the African Space Industry Annual Report 2021

On July 6th, Space in Africa, the leading analytics and consulting firm focusing on the African space and satellite industry released its **African Space Industry Annual Report**. The report is built upon 2 previous editions and covers space activities across the continent as well as industry dynamics, trends and opportunities for both governments and commercial players. In 2021, the report highlights that the African space budget was worth USD 548.6 million which represents a 9% increase in comparison to 2020 and a staggering 94% increase in comparison to 2018. Space for Africa estimates that the African Space Industry could surpass USD 10.24 billion by 2024.

Satellogic to merge with SPAC

Earth Observation start-up Satellogic **concluded an agreement** to merge with Special Purpose Acquisition Company (SPAC), Cantor Fitzgerald Corp. V in Q4 2021. The SPAC merger values the company at \$850 million, which includes a \$100 million PIPE investment led by SoftBank and Cantor Fitzgerald. The company aims to use the new funds to scale up the production of its constellation of Earth Observation satellites, with the goal of achieving global coverage by 2023 and operating 300 satellites in orbit by 2025. Satellogic currently operates a constellation of 17 satellites, four of which were launched on board SpaceX's Transporter-2 Mission in June. Although the company did not report any revenue in 2020, their projected revenue for 2021 constitutes approx. \$800 million. The company is vertically integrated and each of its satellites is capable of capturing images with a resolution of 70 centimetres per pixel, covering approximately 300,000 square kilometres daily.

Spacell raises \$70 million

On July 11, **Spacell raised \$70 million** in new funding from a group of investors including the Patrick and Lina Drahi Foundation, the Kahn Foundation, and the Moshal Space Foundation. The company aims to use the funds to support the development of its Beresheet2 mission, which it expected to cost \$100 million in total. The mission is composed of an orbiter and two landers, one of which is expected to land on the far side of the moon. Spacell plans to be the first company to attempt a double landing on the Moon and the second actor to land on its far side. Spacell's first mission, Beresheet was launched in 2019, but failed to complete a soft landing due to a main engine failure.

Planet to merge with SPAC dMY Technology Group IV

The U.S. start-up Planet is **set to go public through a merger** with the SPAC dMY Technology Group IV. The merger gives the company a post-transaction equity value of \$2.8 billion and will provide Planet with \$545 million in cash balance, as well as a \$200 million PIPE with contributions from investors such as BlackRock, Google, and Koch Strategic Platforms. Prior to going public, Planet had raised \$374 million in funds and currently operates a constellation of 200 Earth Observation satellites providing global coverage. The company serves over 600 customers in various sectors, including agriculture and defence & intelligence. Planet reported a revenue of over \$100 million in 2020.



Credit: Planet



SEC charges Stable Road Acquisition Company and Momentus

On July 13, the SEC **issued an order** charging Stable Road Acquisition Company and Momentus with penalties totalling more than \$8 million for inadequate due diligence following the announcement of their SPAC merger. In the order, the SEC found that the SPAC failed its due diligence obligations to investors by including misleading statements in their public filings regarding the readiness of Momentus' technology and failed to review the results of the company's in-space technology demonstration. The order also indicates that Momentus failed to assess the extent of the national security risk associated with its CEO, affecting the company's access to the governmental licenses essential to its operations. Following the July 13 order, the SEC issued an additional filing on July 16 providing all PIPE investors the option to terminate their subscription agreements without any liability or obligation. Investors having contributed more than half of the total funds raised in the PIPE round terminated their agreements. The two companies are expected to hold a shareholders meeting to approve the merger in August.

Isar Aerospace extends Series B round

The German micro launcher start-up Isar Aerospace **extended its initial €75 million Series B** round of funding by raising an additional €63.1 million on July 28. The new investment was led by HV Capital, Lombard Odier and Porsche SE and bring the total capital raised by the company to over €150 million. The extension makes Isar Aerospace one of the most well-funded space start-ups in Europe as the company continues to expand its activities and readies for the 2022 maiden flight of its Spectrum rocket from the Andøya space centre.

Yahsat successfully completes its IPO and raises approx. \$730 million



Credit: Yahsat

The Satellite communication company **Yahsat successfully completed its IPO** on July 14th, raising approx. \$730 million in funding following the sale of 40% of its share capital. The company's market valuation resulting from the completion of its IPO is equal to roughly \$1.8 billion. Prior to going public on the Abu Dhabi Securities Exchange, Yahsat was a fully-owned subsidiary of the Mubadala Development Company, Abu Dhabi's Government strategic investment company. The Mubadala Development Company still holds 60% of the company's shares following the IPO, which

represents the first time one of the subsidiaries it supported from the inception has gone public. Yahsat currently operates three GEO satellites serving areas in the Middle East, Africa and South America.



In other news

Varda Space raises \$42 million Series A: The company will use the funding to scale-up its development as it aims to establish its first space-based manufacturing facility in 2023, with the objective of producing new materials in microgravity. The round was led by Khosla Ventures and Caffeinated Capital and brings the total amount raised by the company to over \$50 million.

Swedish project group wins development grant to boost LEO satellite terminal: Vinnova, Sweden's agency for public innovation, has awarded a SEK 4 million development grant for the development of a low-cost LEO satellite terminal as a part of the "Electronic components & systems- research and innovation projects 2021" programme. The project group includes SatCube, Chalmers University of Technology, Gapwaves, and Forsway Scandanavia.

Skyroot Aerospace raises \$11 million in Series A funding round and plans to drastically reduce costs: The funding will be used to hire new personnel and complete the development of the Vikram-1 launch vehicle. The company aims to reach orbit as early as 2022, with 90 percent lower development costs when compared to competitors. This will offer new, cheaper options for international customers.

Reaction Engines secures a £3.9 million grant and aims to enable low-carbon space propulsion: The UK-based company was awarded funding from the UK Space Agency to boost its SABRE technology, allowing near-term technology demonstration in hydrogen combustion and supporting the development of other technological elements of the future SABRE systems. The grant builds on earlier government support for Reaction Engines' SABRE technology.

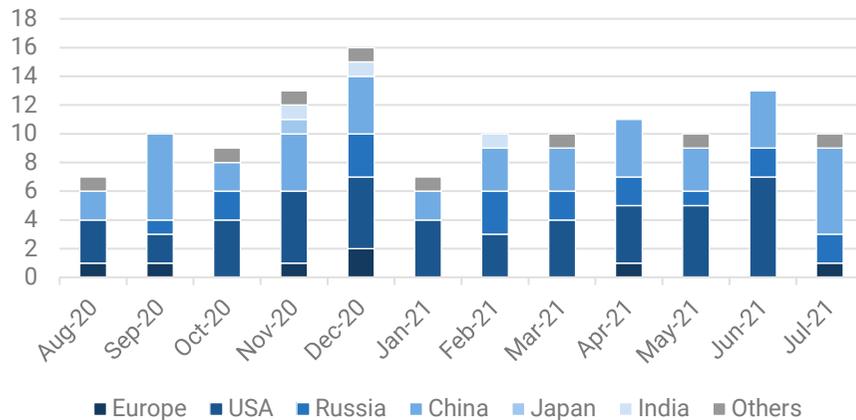


LAUNCHES & SATELLITES

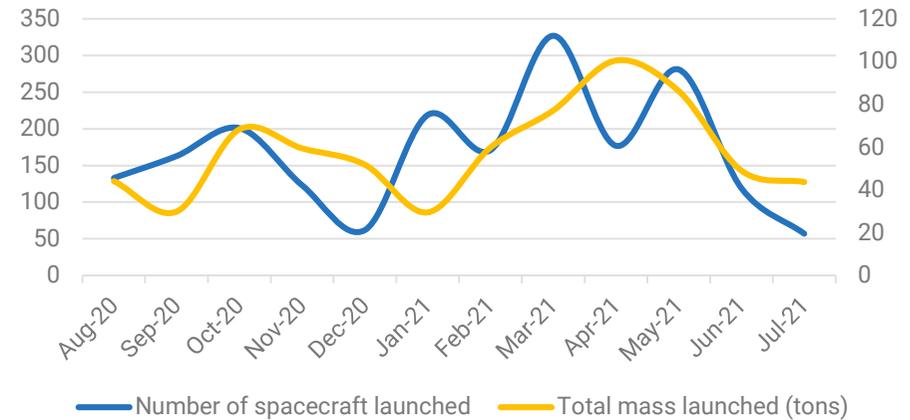
Global space activity statistics

July 2021	Europe	Russia	China	Others	Total
Number of launches	1	2	6	1	10
Number of spacecrafts launched	2	37	17	1	57
Mass launched (in kg)	9651	25 642	8380	10	43 683

Launch activity over the year



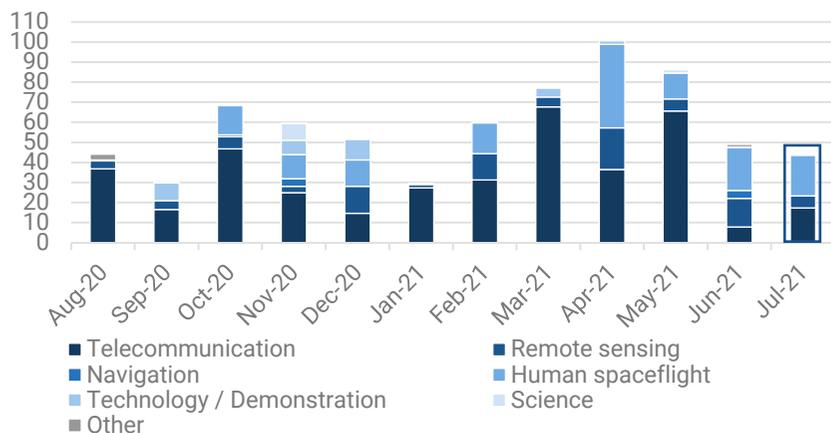
Evolution of the number of launches per launch country



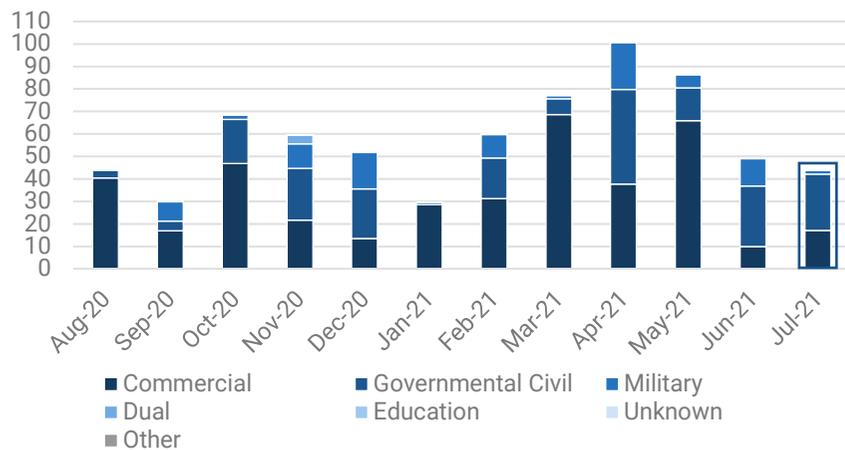
Evolution of launch activity over the year 2020-2021



Satellite missions and markets



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



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

July 2021	Telecommunication	Remote sensing	Human Spaceflight	Technology/ Demonstration
Europe	8753			
USA				10
Russia			20 350	
China	2450	5930		
Others	6190			

Total mass (kg) launched by mission and customer country

July 2021	Commercial	Governmental Civil	Military
Europe	8753		
USA			10
Russia		20 350	
China	2080	4700	1600
Others	6190		

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
01/07/2021	Russia	Soyuz-2-1b Fregat	OneWeb (36 satellites)	OneWeb Ltd.	United Kingdom	OneWeb Satellites (USA)	USA	147 (each)	Telecommunication	Commercial
03/07/2021	China	CZ-2D(2)	Jilin-1 Gaofen-03D (3 satellites)	Chang Guang Satellite Technology Co.	China	Chang Guang Satellite Technology Co.	China	40 (each)	Earth Observation	Commercial
			Jilin-1 Kuanfu-01B	Chang Guang Satellite Technology Co.	China	Chang Guang Satellite Technology Co.	China	1300	Earth Observation	Commercial
			Xingshidai 10	ADA Space	China	MinoSpace Technology	China	10	Earth Observation	Commercial
04/07/2021	China	CZ-4C	FY 3E	National Satellite Meteorological Center	China	SAST	China	2300	Meteorology	Governmental Civil
06/07/2021	China	CZ-3C/G2	TL 1E	CASC	China	CAST	China	2400	Satellite Data Relay	Governmental Civil
09/07/2021	China	CZ-6	Ningxia-1 (5 satellites)	Ningxia Jingui Information Technology Co. Ltd.	China	DFH Satellite Co.	China	120 (each)	Signal Intelligence	Commercial
19/07/2021	China	CZ-2C(3)	Tianqi 15	Guodian Gaoke	China	SAST	China	50	Telecommunication	Commercial
			Yaogan 30-10 (3 satellites)	People's Liberation Army	China	CAS	China	300 (each)	Signal Intelligence	Military
21/07/2021	Russia	Proton-M	MLM-U / Nauka	Roscosmos	Russia	Khrunichev	Russia	20350	Space Station Infrastructure	Governmental Civil
29/07/2021	China	CZ-2D(2)	Tianhui 1-04	People's Liberation Army	China	CAST	China	700	Earth Observation	Military
29/07/2021	New Zealand	Electron KS	Monolith	Air Force Research Laboratory	USA	Utah State University	USA	10	Technology / Demonstration	Military
30/07/2021	France	Ariane-5ECA+	Eutelsat Quantum	Eutelsat	France	Airbus	France	3461	Telecommunication	Commercial
			Star One D2	Embratel	Brazil	Maxar	USA	6190	Telecommunication	Commercial



Launch Highlights

OneWeb reaches partial capacity to deliver connectivity services



Credit: OneWeb

On July 1st, Arianespace launched **36 more OneWeb satellites** with a Soyuz spacecraft. With this launch, the fifth for the company, OneWeb can now deliver its high-speed low-latency connectivity services above the 50th parallel, which includes regions such as the United Kingdom, Canada, Alaska, Northern Europe, Greenland, and the Arctic Region. In some of these places, demonstrations of the service will take place in summer.

Launch of European Robotic Arm and new ISS module Nauka

On July 21st, Russia launched **a new module** to the International Space Station with a Proton-M, a rocket that has not been used since July 2020. The module, called Nauka (or Multipurpose Laboratory Module), is the first one to be added to the ISS since 2016. To make space for Nauka, the 20-year-old Pirs module was decommissioned, making it the first module of the ISS to be deorbited.



Credit: NASA/Shane Kimbrough

Once in orbit, the spacecraft suffered technical problems with its main engines as well as an antenna and docking target, which did not prevent it from docking to the ISS, although with difficulties, on July 29th. After the docking, **Nauka unexpectedly fired its thrusters**, changing the orientation of the station, but the situation was quickly managed.

Finally, Nauka is also carrying the **European Robotic Arm**, a 11-meter device that will be used as the main manipulator on the Russian part of the ISS.

Successful return to flight of Ariane 5



Credit: Arianespace

On July 30th, the Ariane 5 rocket **returned to flight** and launched two GEO satcom for Embratel and Eutelsat. It was the first flight of the rocket in almost one year, as Ariane had not flown since August 2020. One of the reasons for this long gap was the detection of a problem with the fairing during the latest flights of the rocket. Therefore, the Ariane 5 launched with a modified fairing, which aims at the reducing the vibrations for the payloads. One of the two payloads was Eutelsat Quantum, developed in cooperation by ESA, Airbus and Eutelsat through the public-private partnership. The spacecraft is the world's first **software-defined satellite** to be put in orbit. The operator will be able to completely reprogramme it while in orbit in order to adapt its services to the business requirements. In particular, the spacecraft's throughput and coverage zones can be modified. It will also be able to react more quickly to interference.

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