

# ESPI Insights

Space Sector Watch



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## FOCUS: ONEWEB IS DEAD, LONG LIVE ONEWEB



Dear Friends of ESPI,

Throughout the month of July, with the world still coming to terms with the ramifications of COVID-19, the development of the OneWeb saga has expanded to fascinating new levels. On March 27<sup>th</sup> 2020, OneWeb filed for relief under **Chapter 11 of the bankruptcy** code in the United States. Up until then, the company had launched 74 satellites out of a planned 648, secured valuable spectrum rights and had raised considerable financial and public interest in its worldwide broadband coverage concept. While the company was close to securing additional financing, it stated that the economic impacts of COVID-19 made investors backtrack.

In an interesting turn of events, by May 4<sup>th</sup> and due to its precious Ku and Ka band spectrum, OneWeb **had received 14 indications of interests**. With a mix of private and national potential investors, **and with three parties supported by China**, the OneWeb case gained global coverage.

On July 3<sup>rd</sup>, OneWeb accepted a bid by BidCo 100 Ltd., a consortium led by Bharti Global and the UK Government, for a total of \$1 billion joint bid (\$500 million each). This will provide Bharti Global and the UK Government a **45% stake each of OneWeb**, with OneWeb's existing shareholders owning the rest of the balance. The sale was then accepted on July 10<sup>th</sup> during a U.S. bankruptcy court hearing. The court also approved **replacing SoftBank and Grupo Elektra with BidCo 100 Ltd.** as OneWeb's interim financial backer, allowing work to resume for the constellation.

Bharti Enterprises, through Bharti Airtel, is the third largest mobile operator in the world with almost **500 million customers**. Using its extensive South-Asian and Sub-Saharan African networks, it will serve as a testing ground for all OneWeb products and services, essentially **acting as an anchor customer** for large scale OneWeb services. In addition to Bharti, Hughes Network Systems, LLC (HUGHES), a global leader in broadband satellite networks and services, announced on 27<sup>th</sup> July its participation in the bidding consortium, contributing a total of \$50 million. Through this, **Hughes will be able to continue** its distribution and technological partnerships with OneWeb as well develop upon its pre-existing partnership with Bharti Airtel, with which it owns a subsidiary in India (HCIL).

The bid, led by **the UK Government, raised a lot of interrogations**. The unusual governmental investment led the permanent secretary to the Department for Business Energy and Industrial Strategy to pursue a ministerial direction. In addition, Darren Jones MP (BEIS chair) will hold an enquiry into how the decision was made. The UK Space Agency also performed a technical assessment, highlighting significant technical and operational hurdles, as well as the need for additional funding prior to profitability. A lack of transparency in the decision-making process has also been put forward as a cause for concern.

By many standards this is good news for the space sector and especially for OneWeb creditors. In addition, with the bid including a section of OneWeb's manufacturing going back to the United-Kingdom, the positive economic ramifications for the UK will be multifold. Some questions remain, including the CFIUS approval and the potential use of OneWeb for GNSS. What we can say for sure is that the OneWeb saga is far from over.

Sincerely yours,

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

Jean-Jacques Tortora  
Director of ESPI



## POLICY & PROGRAMMES

### European Council agrees to reduced space budget for the EU space programme

On July 21<sup>st</sup>, the European Council approved the revised proposal by the European Commission, dated May 2020, regarding the Multiannual Financial Framework 2021-2027. **The financial envelope for the implementation of the EU Space Programme is set to a maximum of €13.2 billion**, of which €8 billion will be dedicated to Galileo and €4.8 billion to Copernicus. This leaves approximately €400 million available for Govsatcom and SSA/STM components.

This budget is expressed in 2018 prices and **corresponds to €14.9 billion in current prices**. In addition to this commitment for the EU Space Programme, €272 million should be allocated to decentralized agencies, in particular the GSA. This represents a substantial 17.5% reduction in comparison to the initial 2018 European Commission proposal of €16 billion (-€2.8 billion). Galileo/EGNOS will suffer a cut of €1.7 billion and Copernicus a cut of €1 billion. This budget is still subject to the vote of the European Parliament. The envelope does not include other EU instruments supporting the space sector such as Horizon Europe.



*Credit: Arête News*

### ESA announces €2.5 billion Copernicus contracts

On July 1<sup>st</sup>, **ESA's industry policy committee selected the prime contractors** for the development of six High Priority Candidate Missions under the Copernicus Programme, leading to a total award of €2.55 billion. The key design phases (Phase B) of the missions will be led by Thales Alenia Space France (€455 million), Thales Alenia Space Italy (€997 million), Airbus Defence and Space Germany (€300 million), Airbus Defence and Space Spain (€375 million), and OHB-System Germany (€445 million). Then, the pursue of phase C/D requires a favorable decision by the European Commission, ESA and EU Member States by 2021. The package also relies on future funding from the next EU MFF.

**UK companies** can still participate in the Copernicus R&D stage, but they can no longer bid for development and manufacturing phases due to the Brexit. The UK is still negotiating the status of "third country" for the EU Copernicus programme. **UK's €170 million commitment to new Sentinels R&D budget** is not yet reflected in the value of contracts going to the country but some budget remains to be allocated for support activities such as ground control and technology development.

### New Russian space-based anti-satellite test raises concern

On July 15<sup>th</sup>, the U.S. Space Surveillance Network of radar and telescopes tracked the deployment of a secondary payload into orbit from the Russian Cosmos 2543 satellite. The object was unusually deployed near another Russian satellite at a high relative speed. The maneuver has been classified by the U.S. Space Command **as a non-destructive anti-satellite test involving the employment of a space-based weapon**. The U.S. Space Command also highlighted that the operation is "inconsistent with their stated mission" as an inspector satellite. The U.S. states that the same satellite system has been used for two other tests back in February. On July 27<sup>th</sup>, the United States and Russia conducted **the first formal Space Security Exchange meeting since 2013**. Located in Vienna, the aim of the talks will be to incentivize responsible behavior in outer space.



## Three historic missions to Mars seize the July window

### UAE's first mission to Mars

On July 19<sup>th</sup>, the UAE's "Hope Probe" was launched to Mars from Japan's Tanegashima Space Center. The mission design, development, and operations led by the Mohammed bin Rashid Space Centre (MBRSC). The Emirates Mars Mission is the country's first interplanetary mission as well as the first planetary science mission to be led by an Arab country. After a seven-month journey to Mars the Hope Probe is expected to collect data about the climate and atmosphere of the Red Planet over the span of one Martian year (two Earth years). Studies will be conducted on daily and seasonal changes and on the loss of hydrogen and oxygen gases into space. The Hope mission cost \$200 million and is equipped with three science instruments, including a high-resolution camera and two sophisticated spectrometers.



*Credit: Mitsubishi Heavy Industries*

The mission has been conducted **in partnership with several U.S. academic institutions**. In particular with a team of the University of Colorado Boulder to develop and assemble the spacecraft. Motivated by the prospect to expand their trade and defense ties with Middle Eastern countries, Japan also partnered with UAE, winning the contract to launch the Hope spacecraft on an H-2A rocket.

### Tianwen-1 rover, first independent Chinese launch to Mars

The **Chinese Tianwen-1 mission** launched successfully on 22<sup>nd</sup> July, marking the start of the first solo Chinese mission to Mars. The Long March 5 rocket launched from Wenchang Satellite Launch Center, flying over the Philippines, using tracking support from ESA ESTRACK. The spacecraft is comprised of an orbiter and rover and carries 13 science payloads to study the atmosphere, magnetosphere, surface, subsurface and climate of Mars. Previously, China attempted a Mars mission known as Yinghuo-1, attached to the Russian Fobos-Grunt spacecraft, but the upper stage propulsion system failed, leaving it stranded in Earth orbit. Tianwen-1 will arrive at Mars in February 2021, where it will perform a series of orbital maneuvers before attempting to land the rover. The mission builds on China's heritage from the Chang'e missions to the Moon. China is also planning a sample return mission known as ZhengHe to a near Earth asteroid in 2022.

### NASA successfully launches Perseverance rover, first step toward Mars sample return

On July 30<sup>th</sup>, **NASA launched its Mars 2020** on a ULA Atlas V rocket from Space Launch Complex 41 at Cape Canaveral Air Force Station in Florida. The mission is expected to descend to the Martian surface in February 2021. Mars 2020 primarily includes the Perseverance rover, the Ingenuity helicopter and several other scientific payloads such as **cameras and microphone** for landing, which will provide unprecedented visibility into Mars landings.



*Credit: NASA/JPL-Caltech*

Through Perseverance, the U.S. will reach a better understanding of the geology and climate of Mars all while seeking signs of ancient microbial life. One experiment (MOXIE) will study the potential conversion of CO<sub>2</sub> into oxygen. The rover will collect samples of rock and soil, storing it in tubes which will be deposited on the Martian surface or kept by the rover itself becoming available for future retrieval. The overall goal of the mission is to return these samples to Earth by a follow up of with two future missions in partnership with ESA, with a secondary launch projected in 2022.





### Japan publishes new space policy

On June 30<sup>th</sup> 2020, the Cabinet Office of Japan released a new version of the Basic Plan on Space Policy to guide Japan's space activities over the next decade. Since the enactment of the Basic Space Law in 2008, Japan's space programme has been quietly - yet firmly - undergoing a profound transformation aimed at conferring the country with the tools to reinvigorate its strength, prestige and autonomy in the international space arena. An examination of Tokyo's strategic posture indeed reveals that the scope of this transformation is broad and far-reaching, encompassing a wide range of security, socio-economic and diplomatic considerations.

The **ESPI report** disentangles all these dimensions and identifies both the driving forces and objectives that are guiding Japan in its space efforts.



### The U.S. NSC outlines space exploration approach, Japan to cooperate with NASA for Artemis

On July 23<sup>rd</sup>, the U.S. National Space Council issued a report called **"A New Era for Deep Space Exploration and Development."** It outlines the rationale and purpose for U.S. human space exploration plans through Artemis and beyond. Following Trump's space policy cornerstone of returning astronauts to the Moon and going to Mars, the document lays out a strategy to accomplish that. It requires a whole-of-government approach, involving NASA, as well as other agencies such as the National Institutes of Health to the Department of Homeland Security. The five primary government roles identified in the document are

- the promotion of a secure and predictable space environment for the long-term sustainability of space activities;
- the support of the development of commercial activity and industry in space;
- the support of research and development of new space technologies; with commercial and international partners,
- the creation of infrastructure needed for space exploration and development; and
- the support of advanced space research by public and private sector U.S. research communities.

On July 9th, NASA Administrator, Jim Bridenstine, and the Japanese Minister of Education, Culture, Sports, Science and Technology, Koichi Hagiuda, signed a **Joint Exploration Declaration of Intent (JEDI)** on the cooperation plan for the International Space Station and NASA's Artemis program. The JEDI addresses both human and robotic lunar surface exploration, specifically focusing on Japanese contributions to the lunar Gateway and the Moon's surface exploration.

### ISRO allows private operators to set up their own launchpads at Sriharikota

The Indian Space Research Organisation (ISRO) has given the permission to the private sector to set up their own launch facility at the Sriharikota launch centre (SHAR). In accordance with the **historic decision of the Indian Union Cabinet** on June 24<sup>th</sup> to open space assets for all, non-government private entities (NGPEs) will participate in a broader range of space activities, providing space-based services, developing space-based applications and manufacturing spacecraft and launch vehicles. ISRO will share its expertise, providing technical support. The promotion and supervision of the space activities will be conducted by a new space board named the Indian National Space Promotion and Authorisation Centre (InSPACe).



### In other news

- **Changes in French space governance:** The responsibilities for French Space Policy have been transferred from the Ministry of Higher Education, Research and Innovation to the Ministry of the Economy, Finance and the Recovery, following the Decree no 2020-871. In the defence domain, the French Minister for Armed Forces announced the transformation of the Air Force into the Air and Space Force (Armée de l'Air et de l'Espace).
- **Appointment of new EUMETSAT Director-General:** The Council of EUMETSAT has appointed Philip Evans to replace Alain Ratier as the next Director-General for a five-year term. The mandate will start on 1<sup>st</sup> January 2021.
- **Thomas Pesquet, first European astronaut to fly SpaceX Dragon:** ESA astronaut Thomas Pesquet has officially been assigned to the second operational flight of SpaceX's Crew Dragon spacecraft, launching in 2021 from Cape Canaveral, U.S., to the ISS.
- **JAXA – Australian Space Agency Joint Statement for Cooperation in the Hayabusa2 Project:** On July 14<sup>th</sup>, JAXA and ASA agreed on a collaboration aimed at building a significant partnership in line with the Memorandum of Cooperation (MOC) on Asia-Pacific activities that was signed on the 7<sup>th</sup> of July. The partnership will notably aim at recovering the Hyabusa Capsule which will re-enter in December 2020 in Australian waters.
- **SETI Institute awarded contract for planetary protection support:** NASA has updated the Planetary Protection Policies, modernizing its guidelines for the prevention of biological contamination of the Solar System in its long-term human exploration plans. In this regard, the Search for Extraterrestrial Intelligence Institute (SETI) has signed a contract with NASA with a maximum award value of \$4.7 million over a five-year period which began on July 1<sup>st</sup>. The award aims to support all phases of current and future America's human spaceflight exploration to Moon and Mars. In particular, the SETI team will help to ensure full compliance with the new planetary protection standards, develop guidelines for the implementation of NASA requirements, provide training for NASA's operations and disseminate information to stakeholders and the public.
- **US House Appropriations Committee approves fiscal year 2021 Defence Funding Bill:** In its report, the committee criticizes the change in priorities of NASA, and reallocates \$1.5 billion to several NASA science missions. More specifically, these will be allocated to five STEM engagement and science programs that the Trump administration sought to cancel for FY2021. The Defence Funding Bill still must be ratified by the Senate and Congress.
- **DoD withdraws contracts awarded in June under the Defense Production Act for small launch contracts:** The contracts were withdrawn from six small launch companies due to widespread complaints about the selection process. The companies were VOX Space, Aevum, Astra, X-Bow, Rocket Lab and Space Vector. The funds of \$116 million were redirected to other programs.
- **On July 21<sup>st</sup>, the U.S. Democratic Party released a tentative draft of the party's 2020 platform:** The party document expands on key democrat goals and policy developments on all American sectors. They expressed their support for NASA as well as a continued presence on the ISS and crewed missions to the Moon and Mars. However, the platform does not explicitly reference NASA's goal regarding the Artemis mission to land a crewed mission on the Moon by 2024.



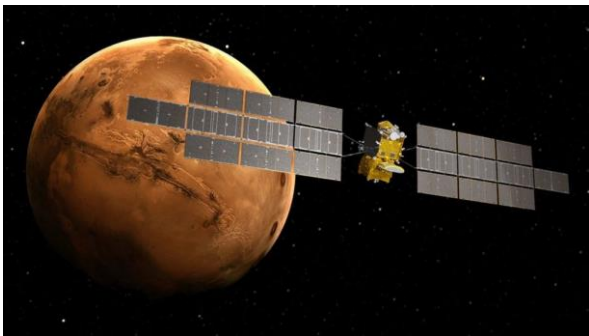
## INDUSTRY & INNOVATION

### Amazon receives FCC approval for Kuiper Constellation

On July 30<sup>th</sup>, the FCC **approved Amazon's Kuiper constellation** of 3,236 high-speed broadband satellites in LEO. In order to maintain its authorization, Amazon have to submit an updated debris mitigation plan to the FCC once the spacecraft design is finalized, as well as launch at least 50% of its satellites within six years and orbit the full constellation within nine years. With an investment of over \$10B, Amazon plans to deploy Kuiper satellites in five phases, starting service once the first waves of 578 satellites is in orbit. The satellites will operate in three orbital layers which are at 590 km, 610 km and 630 km.

### European companies to participate in exploration programmes

#### Airbus to build Earth Return Orbiter to launch for Mars in 2026



*Credit: Airbus*

Airbus **will build the Earth Return Orbiter (ERO)** for the Mars Sample Return mission in a contract with ESA, to be finalized in September. ESA's contribution to the NASA mission is estimated at €1.5 billion of a total cost of over €7 billion over 10 years. The 6.5 tons, 39m wingspan satellite will launch in 2026 before heading to Mars using chemical and electric propulsion systems. The spacecraft will then catch a rocket containing Mars samples launched by the Perseverance rover. ERO will then return to Earth orbit, package the sample in a re-entry capsule and return them to Earth.

#### Thales Alenia Space to support NASA lunar rover

Thales Alenia Space **has signed a contract with NASA** on July 28<sup>th</sup> to deliver a X-band Transceiver and Diplexer for communications on the Volatiles Investigating polar Exploration Rover (VIPER). VIPER will use a 1m drill to search for ice and other resources on the south pole of the Moon. It launches in late 2023. VIPER is part of the NASA Artemis program to establish a sustainable human presence on the moon later this decade.

### Steps forward for UK domestic space launch ecosystem

The UK Government **signed a technology safeguards agreement (TSA)** with the United States on July 14<sup>th</sup>, ensuring sensitive technology used in U.S. space launches from UK territory are protected by appropriate safeguards. Furthermore, regulation of spaceflight launches **has been transferred** to the UK Civil Aviation Authority from the space agency. The announcement comes ahead of **further regulation** expected to cover licensing and oversight of launch vehicles and sites in the UK.

Skyrora, the UK based launch startup established in 2017, **opened an engine testing facility** in Scotland where it has tested both its suborbital and orbital rocket engines. It estimates that the complex will help create over 170 jobs in the area by 2030. They expect to launch their second sub-orbital rocket, Skylark L, early next year, ahead of their LEO rocket, Skyrora XL.





### Boeing Starliner test flight review reveals important oversights



Credit: NASA, Starliner

NASA has released the results of **an independent investigation** into the failed test flight of Boeing's Starliner Spacecraft in December 2019. The investigation revealed that Boeing did not run a full test of in the 48 hours before launch, instead breaking it into different blocks. This resulted in the spacecraft using an incorrect mission elapsed time from the Atlas V launch vehicle, expending too much fuel and failing to dock with the ISS. Additionally, a further software error which was rectified hours before the vehicles return to Earth would have critically affected the spacecraft.

The findings included a set of 80 recommendations, specifically highlighting the lack of proper hardware and software integration testing to be carried out in accordance with better oversight and documentation. Boeing announced that it will self-fund the next Starliner mission for NASA, at a cost of \$410M, before the end of 2020. Should it be successful, a crewed test flight with three astronauts would then occur late 2021.

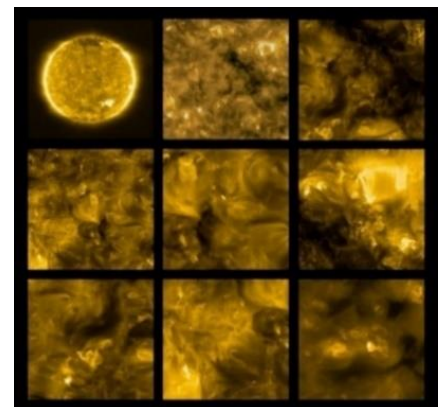
In light of these oversights, members of **NASA's independent Safety Advisory panel** expressed further concerns regarding Boeing Starliner quality control during a July 23<sup>rd</sup> teleconference. They recommend completion and approval of all recommendations prior to the next orbital flight test.

### Eumetsat shifts two delayed satellites to Ariane 6

Eumetsat announced on July 10<sup>th</sup> that it has **shifted the launch vehicle** for two European weather satellites from Ariane 5 to Ariane 6. Manufacturing delays caused by technical difficulties and the effects of the COVID-19 crisis have caused two of the three Meteosat Third Generation satellites to be delayed beyond 2023, when Arianespace switches to Ariane 6 rockets. MTG-I1 will be ready before 2023 and will launch on an Ariane 5.

### Solar Orbiter takes closest pictures of Sun

Solar Orbiter (SolO), the ESA probe launched in February, **has returned its first pictures** of the Sun's surface on July 16<sup>th</sup>. They were taken 77 million km from the Sun, the closest pictures taken to date. The pictures show miniature solar flares unable to be seen by Earth based telescopes. SolO will **continue to gather data** through 10 instruments, giving scientists a better understanding of solar flares, the heliosphere, and space weather. In December it will perform a flyby of Venus, before taking a further three years to reach its operational orbit, which will have a closest approach of 43 million km.



Credit: Solar Orbiter/EUI Team (ESA & NASA)



### In other news

- **Blue Origin delivers the first BE-4 engine to ULA:** Blue Origin delivered the first BE-4 engine, a pathfinder engine to be used only for testing, to ULA on the July 1<sup>st</sup>. Two BE-4 engines will be used in the main stage of the Vulcan Centaur rocket which is currently in development and planned to launch in 2021. ULA is hoping to use the Vulcan Centaur rocket to win one of two U.S. Space Force contracts to launch further national security satellites between 2022 and 2027. It will also be used in the Blue Origin New Glenn rocket which is also slated to launch in 2021.
- **Airbus Expands SpaceDataHighway:** Airbus completed the EDRS-C satellite commissioning tests on July 15<sup>th</sup> and will start operational services as the second satellite on the SpaceDataHighway. The satellite has established laser communication links with the Copernicus Sentinel satellites, meaning sentinels can now transmit twice as much data in total and through two satellites simultaneously. The SpaceDataHighway, established with the EDRS-A satellite in 2017, is able to transmit 1.8 Gbps in near real time. It is the first laser communication geostationary constellation and was created as a PPP between ESA and Airbus.
- **NASA delays the JWST launch by seven months:** The target launch date for the James Web Space Telescope (JWST) has shifted from March to October 2021. Technical challenges for the remaining integration and test activities prior to launch, as well as the COVID-19 associated inconveniences have forced NASA to postpone the launch. The mission is still expected to fall within the \$8.8 billion expanded budget.
- **Google's Loon launches HAPS balloon internet service in Kenya:** Loon, a subsidiary of Google parent company Alphabet, has on July 7<sup>th</sup> launched a fleet of high-altitude balloons to provide 4G LTE internet services in remote areas of Kenya in partnership with Telkom Kenya. It is the first non-emergency commercial deployment by Loon. The service will use 35 or more tennis court sized balloons floating at an altitude of 20 km, resulting in a coverage of 50,000 km<sup>2</sup> across central and western Kenya. The speed will be sufficient for web browsing and video streaming.
- **HAPSMobile completes HAPS test flight:** HAPSMobile, the Softbank subsidiary backed by AeroVironment, has successfully tested its fixed wing HAPS UAS, named Sunlider, in New Mexico. This test occurred at low altitude, but the company will now prepare for stratospheric test flights.
- **Hypergiant collaborates with US Air Force on reconfigurable constellation:** Texas based start-up Hypergiant industries has received a SBIR research grant from the Air Force to develop a constellation of 24 to 36 CubeSats with reconfigurable payloads and AI software. These CubeSats are aimed to be responsive and flexible to military needs. First launch is expected in 2021.

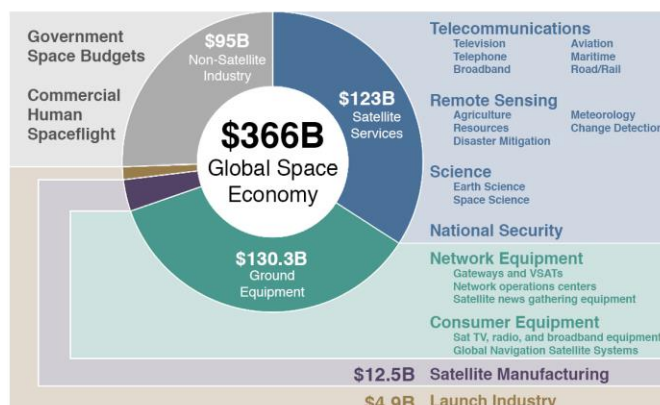


## ECONOMY & BUSINESS

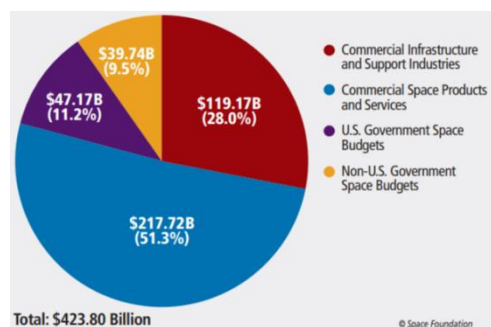
### SIA/Bryce and Space Foundation release annual estimations of the global space economy

The Satellite Industry Association (SIA) released its **annual State of the Satellite Industry Report**, produced by Bryce Space and Technology. The report estimates that the Global Space Economy reached \$366 billion in 2019, an increase of 1.7% with comparison to 2018.

The report also points out that the amount of operational satellites orbiting the Earth increased by 17% reaching 2460 operating systems currently in orbit.



2019 revenues worldwide, Source: SIA/Bryce

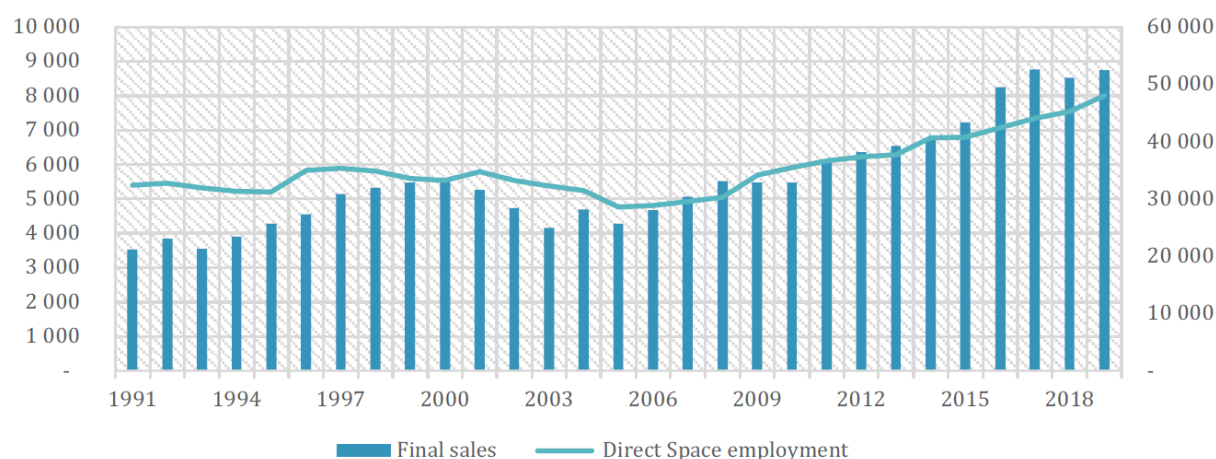


Global space economy, Source: Space Foundation

The Space Foundation also released the Space Report Q2, which estimates that the global space economy grew to \$424 billion in 2019, an increase of 2.2% from 2018. Growth was seen across most segments including in particular a \$20 billion increase in the Commercial infrastructure and support industries segment (+20%). The value of commercial space products and services however decreased to \$217.7 billion (-4.8%).

### Eurospace Facts and Figures on the European space industry in 2019

ASD-Eurospace have released their **2019 Facts and Figures report** on July 23<sup>rd</sup>. The report highlights that the European upstream space industry posted sales worth €8.7 billion in 2019, up 2.6% from 2018. Direct industry employment increased 5.7% to 48000 FTEs, which represents 5-6% of the worldwide industry. Satellite applications, including communications, EO and GNSS have driven the growth, with launchers and science remaining level. Furthermore, the report points out that the EU is fourth after the USA, China and Russia in both satellite manufacturing and launches.

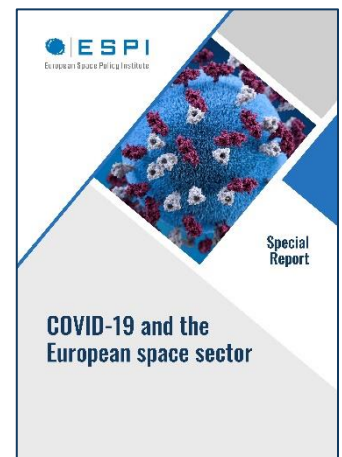


European space industry final sales and direct employment (Source: Eurospace)



### COVID-19 crisis hits the global space sector

In July 2020, ESPI released a **report on COVID-19 and the European Space sector** to provide an overview of how space was used in response to the crisis and how the sector was itself been impacted. The report specifically points out that the crisis showcased the relevance of European space programmes which actively contributed to the response to the crisis and the key role played by institutions to support the development of new tools and applications. The report underlines that, although structurally more resilient, the space sector has also been profoundly impacted by the COVID-19 crisis. The impact was partially mitigated by the measures taken by public institutions to ensure business continuity, but the sector suffered from shutdowns, supply chain disruptions, payment delays and orders cancellation. In this unprecedented context, Airbus's Q2 **results showed reduction of revenues** in the Defence and Space segment around 16% lower than on the same period in 2019. This includes lower revenues in the Space Systems segment as well as delays in multiple other programmes.



### SES files \$1.8 billion claim against Intelsat over splitting C-Band Alliance

SES **has filed a claim** on July 14<sup>th</sup> against Intelsat, seeking \$1.8 billion in damages for Intelsat's withdrawal from the C-Band Alliance, accusing it of breach of contract, breach of fiduciary duties, and unjust enrichment. Following its bankruptcy filing in May, Intelsat lobbied the FCC to consider the C-Band Alliance as disbanded, in an unsuccessful claim for a larger payment from the FCC. SES states that Intelsat breached the consortium agreement to evenly split proceeds from a potential private auction of C-band spectrum. The private auction was instead replaced by a public auction in December, the proceeds of which will go the U.S. treasury.

### UK orders new Skynet-6A satellite

On July 19<sup>th</sup> the UK Military **signed a contract worth £500 million** with Airbus Defence and Space to enhance and extend the Skynet fleet. It involves the manufacture, launch and ground segment upgrade of the Skynet-6A satellite. The military communications satellite will be tested at the new National Satellite Test Facility run by RAL Space in Harwell, Oxfordshire. The UK Government **has not yet decided** on a successor to the Skynet-5 network, the contract for which expires in 2022. Its investment in OneWeb (see focus) could play a part in the future system. Skynet-6A is planned to launch in 2025 and will act as a gap filler ahead of the new network.

### NASA awards \$51 million to small businesses

At the end of June, NASA **announced contracts** worth \$51 million for 409 proposals across 312 businesses as part of the Phase I awards for Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programmes. The proposals aim to benefit human exploration, science, technology, and aeronautics, with potential terrestrial applications. Companies will receive up to \$125,000 for each successful Phase I proposal, with potential for larger Phase II grants. Under the NASA SBIR program's **post-Phase II funding initiatives**, NASA has selected four US small businesses to support the development of space technologies relevant to Artemis program (Fibertek, Qualtech Systems, Pioneer Astronautics, and Protoinnovations). NASA expects to invest approximately \$17 million, with a contract value between \$2.5 million and \$5 million for each company.

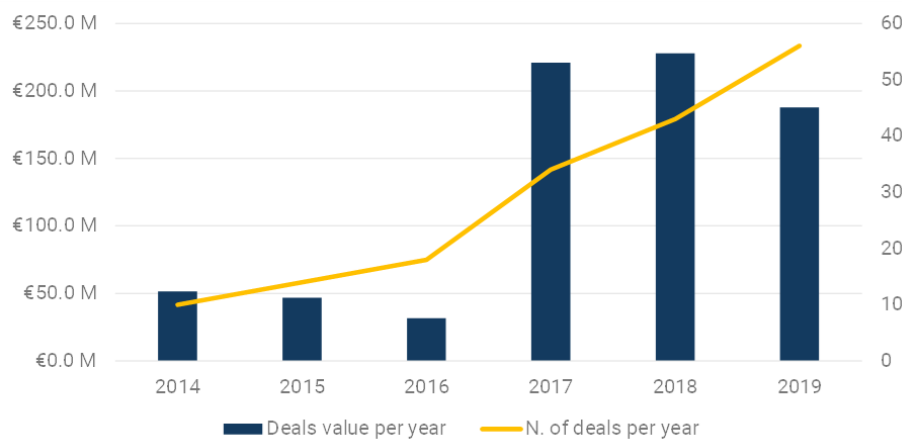


## Boeing to support ISS operations through 2024

On the 15th July Boeing **signed a contract worth \$916 million** with NASA, which extends its support to ISS operations until September 2024. Boeing has been NASA's prime industry partner for the ISS from 1993 and the new contracts are worth around \$225 million each year. Boeing will continue to enhance the utility and of the station through support services, resources, and personnel for activities aboard the ISS.

## Private investment in the European space sector in 2019

2019 marked a plateauing of the volume of European private space investments. The new **ESPI report Space Venture Europe 2019** provides an in-depth investigation of the evolution of the European private space environment and entrepreneurship dynamics. The report points out that €188 million were invested throughout the year and across 56 deals and, while total volume of investment was down compared to 2018, the number of deals increased reaching an all-time high. Furthermore, 62% of all private investment originated from Venture Capital funds and 37% of total investment was concentrated in the top 5 deals. Key takeaways from the 2019 survey include the fact that revenue acquisition and customer growth are the top priorities for European Space start-ups.



Private investment value and number of deals per year 2014-2019

## Exotrail raises €11 million for on-orbit transportation

French start-up Exotrail **has raised €11 million in a series A round** led by European VC firms Karista and Innovacom on July 16<sup>th</sup>. Founded in 2017, the start-up has a range of small satellite propulsion systems and related services, and aims to become a leader in on-orbit servicing. It has **raised \$17.4 million** to date. Investor Karista also manages the CosmiCapital space fund, which is supported by CNES. The new funding will allow Exotrail to scale up manufacturing and business development, as well as extending its product portfolio.

## Italian space venture fund raises €58 million

Primo Space Fund, a new space VC fund run by Primomiglio SGR, **has raised €58 million** as of July 27<sup>th</sup>, including €30 million from the European Investment fund. Primo Space will invest in early stage startups, spin-offs and SMEs, working closely with the Italian Space Agency and academia. It will target both upstream and downstream segments of the space industry. The fund will continue to grow, aiming to raise a total of €80 million.





### In other news

- **DoD awards \$15 million Defense Production Act contract to LeoLabs:** The US Department of Defense has awarded a \$15 million contract to space surveillance data startup LeoLabs. Leolabs, based in Silicon Valley, maintains ground-based radars to track satellites and debris in low Earth orbit. The funding came from the Coronavirus Air, Relief, and Economic Security (CARES) Act signed on March 27<sup>th</sup>, which provided \$1 billion for efforts under the Defense Production Act to offset losses brought about by the coronavirus pandemic.
- **FCC awards \$20 million to Viasat for broadband services in rural Pennsylvania for 10 years:** FCC authorized \$20 million in a ten-year process of funding for Viasat to expand rural broadband in Pennsylvania. The award is part of the 2018 Connect America Fund Phase II auction, which has allocated more than \$1.47 billion.
- **Voyager Space Holdings acquires Pioneer Astronautics:** Pioneer Astronautics has carried out a range of R&D programs on space technology for a range of customers since its formation in 1996. Voyager Space Holdings is aiming to create a vertically integrated, publicly traded company capable of conducting a range of space missions via acquisition of existing companies. It acquired satellite servicing startup Altius Space Machines in 2019. The move represents the growing interest of private equity in the new space industry, as companies look to exploit synergies between companies.
- **Esri and Planet expand satellite imagery partnership for ArcGIS software:** A new reseller agreement between Esri, the global market leader in GIS software, and Planet Labs Inc., an American Earth imaging company, aims to expand imagery accessibility, providing integrated satellite data for shared customers. The ArcGIS community will now benefit from the direct access to Planet Imagery within its ArcGIS Pro software. The collaboration will also hinge on developing advanced geospatial solutions for civil government and the energy industry.
- **Orange partners with Eutelsat to provide satellite broadband in France:** Orange has purchased from EUTELSAT Communication the high-speed fixed broadband capacity of the EULOSAT KONNECT satellite. Following the "Plan France Haul", from January 2021, it will allow to cover the French territory, included the most isolated area, and increase broadband of at least 30 mbps by 2022. Orange's Nordnet subsidiary is the leading French distributor of satellite Internet services since 2008. The agreement will apply until the entry into service of the KONNECT VHTS high-speed satellite.
- **Amazon pushes further into space with new AWS business segment:** Amazon Web Services have launched an Aerospace and Satellite Solutions business segment to provide new services, including processing space data on Earth and in orbit, and cloud solutions for space missions. This follows the launch of the AWS Ground Station network, giving space startups a network of ground stations rather than building their own, in 2019. The new service adds to the portfolio of Amazon/Bezos space ventures including Blue Origin and the Project Kuiper constellation currently in development. The new division will be led by retired U.S. Air Force General Clint Crosier.

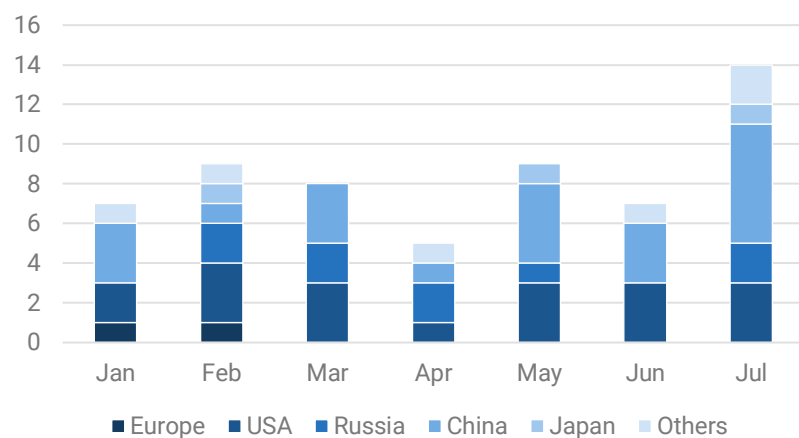


## LAUNCHES & SATELLITES

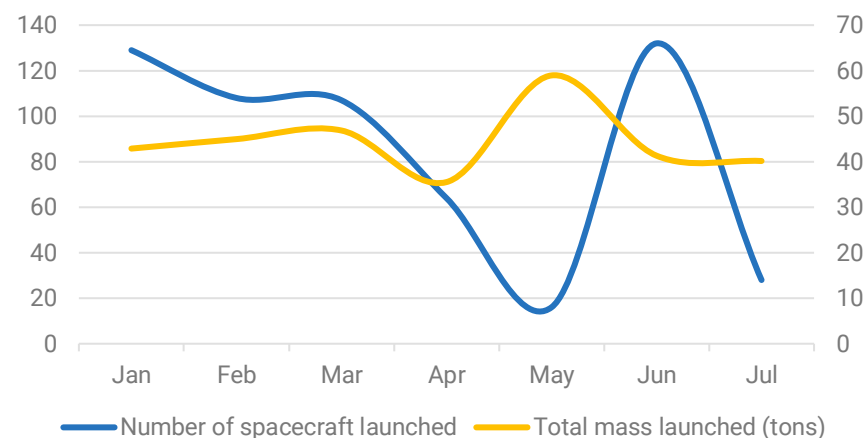
### Global space activity statistics

July 2020	USA	Russia	China	Japan	Others	Total
Number of launches	3	2	6	1	2	14
Number of spacecraft launched	6	3	10	1	8	28
Mass launched (in kg)	9 200	9 400	16 050	1 400	400	36 450

### Launch activity over the year



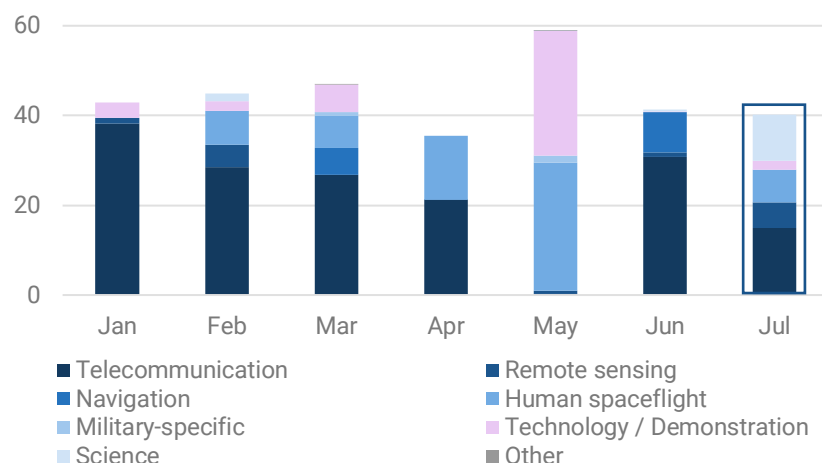
Evolution of the number of launches per launch country



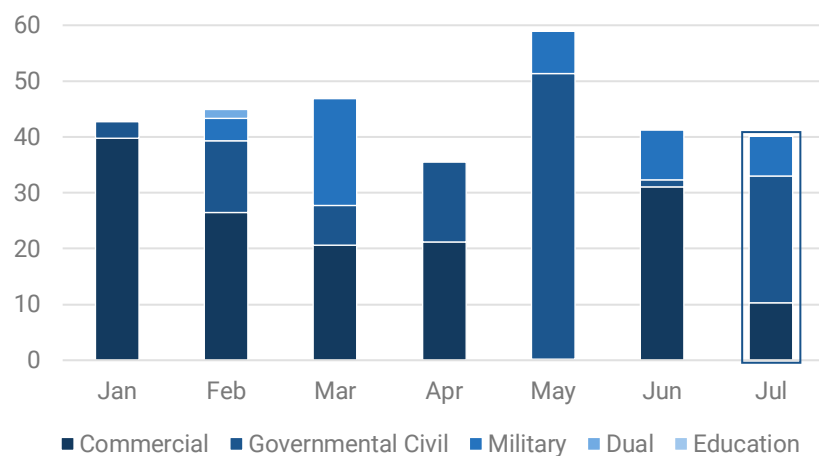
Evolution of launch activity over the year 2020



## Satellite missions and markets



Evolution of the total mass launched (tons) per mission



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

July 2020	Telecom	Remote sensing	Human spaceflight	Techno/Demo	Science
Europe				10	
USA		30		1 600	3 800
Russia	4 400		7 300		
China	5 600	5 300		380	5 100
Japan		50			
Others	500	350			1 400

Total mass (kg) launched by mission and customer country

July 2020	Commercial	Governmental Civil	Military	Education
Europe	10			
USA	30	3 800	1 600	
Russia	4 400	7 300		
China	5 900	10 200	200	2
Japan	50			
Others		1 400	5 400	

Total mass (tons) launched by market and customer country



## Launch Log

Launch date	Launch country	Launcher	Spacecraft name	Main customer	Customer country	Prime manufacturer	Manufacturer country	Mass (kg)	Mission	Market
03/07/2020	China	CZ-4B	BY 2	Xibaipo Middle School	China	Xibaipo Middle School	China	2	Technology / Demonstration	Education
			Gaofen Duomo	CNSA	China	CAST	China	2500	Earth Observation	Governmental Civil
04/07/2020	China	CZ-2D(2)	Shiyan 6-02	People's Liberation Army	China	DFH Satellite Co.	China	200	Technology / Demonstration	Military
04/07/2020	New Zealand	Electron KS	CE-SAT 1B	Canon Electronics	Japan	Axelspace	Japan	50	Earth Observation	Commercial
			Faraday-1	InSpace	UK	GOMSpace	Denmark	10	Technology / Demonstration	Commercial
			Flock-4e (5 satellites)	Planet	USA	Planet	USA	5 (each)	Earth Observation	Commercial
06/07/2020	Israel	Shavit-2	Ofeq 16	Tsahal	Israel	IAI	Israel	350	Earth Observation	Military
09/07/2020	China	CZ-3B/G2(2)	APStar-6D	APT Satellite	China	CAST	China	5550	Telecommunication	Commercial
10/07/2020	China	Kuaizhou-11	CentiSpace-1 S2	Future Navigation	China	CAS	China	97	Technology / Demonstration	Commercial
			Jilin-1 Gaofen-02E	Bilibili	China	Chang Guang Satellite Technology Co.	China	172	Earth Observation	Commercial
15/07/2020	USA	Minotaur-4	USA 305 to 308	NRO	USA	Unknown (USA)	USA	400 (each)	Technology / Demonstration	Military
19/07/2020	Japan	H-2A-202	Al-Amal	UAE Space Agency	UAE	MBRSC	UAE	1350	Planetary Science	Governmental Civil
20/07/2020	USA	Falcon-9 v1.2 (Block 5)	ANASIS-2	Korean Agency for Defense Development	South Korea	Airbus	France	5000	Telecommunication	Military
23/07/2020	Russia	Soyuz-2-1a	Progress-MS 15	Roscosmos	Russia	RKK Energia	Russia	7280	Cargo Transfer	Governmental Civil
23/07/2020	China	CZ-5	Tianwen-1	CNSA	China	CASC	China	5000	Planetary Science	Governmental Civil
25/07/2020	China	CZ-4B	Longxia Yan X Shexian	Nanjing University	China	SAST	China	50	Space Science	Governmental Civil
			Tianqi 10	Guodian Gaoke	China	SAST	China	50	Technology / Demonstration	Commercial
			ZY-3 03	Ministry of Natural Resources	China	CAST	China	2630	Earth Observation	Governmental Civil
30/07/2020	USA	Atlas-5(541)	Mars 2020 (Perseverance)	NASA	USA	NASA	USA	3839	Planetary Science	Governmental Civil
30/07/2020	Russia	Proton-M Briz-M (Ph.3)	Ekspress 103	Roscosmos	Russia	ISS Reshetnev	Russia	2280	Telecommunication	Commercial
			Ekspress 80	Roscosmos	Russia	ISS Reshetnev	Russia	2110	Telecommunication	Commercial



### Mission highlights

#### July's high failure rate



*Credit: People's Daily /IC*

Unusual for such a short timeframe, two rocket failures happened during the month of July 2020. On July 4<sup>th</sup>, following 11 successful launches, Rocket Lab's Electron suffered its first failure since its inaugural launch in 2017. One of the lost spacecrafts, Faraday-1, was the demonstration satellite of UK start-up In-Space Missions, which plans to provide services to companies that do not want to build a satellite themselves but only to supply a payload. In this case, one of them was a test for a reprogrammable software-defined radio developed by Airbus DS. The failure of Electron was **described** as a "kick in the teeth" by In-Space Mission's CEO.

On July 10<sup>th</sup>, the Chinese company ExPace carried out the first launch (originally planned in 2018) of its new rocket, **the Kuaizhou-11**, which failed, leading to the loss of the two satellites onboard.

Kuaizhou-11 is a larger version of the Kuaizhou-1A, also operated by ExPace, and can lift up to 1000 kg to SSO or 1500 kg to LEO. Like its predecessor, the rocket is launched from a mobile platform. This is the third failure of the year for China, as another new rocket, the Long March-7A, failed its maiden launch in March, and a Long March-3B exploded in April.

#### South Korea first military communications satellite

On July 20<sup>th</sup>, **SpaceX launched the Anasis-2 satellite**, the first dedicated military communications satellite of South Korea. The satellite is part of an offset deal for the acquisition of F-35s by South Korea. As such, Lockheed Martin oversaw the satellite development but subcontracted manufacturing to Airbus DS. The flight on SpaceX was also procured by Lockheed Martin on behalf of South Korea's government. The launch also marked a record for SpaceX: indeed, the first booster used for this launch was also used for Crew Dragon's launch at the end of May, meaning that a delay of only 51 days took place between the two launches. Therefore, SpaceX broke the overall turnaround record for an orbital rocket, that was previously held by the Space Shuttle Atlantis (54 days). Moreover, both the booster and two fairing halves used during the launch were recovered by the company.



*Credit: Airbus*



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