

ESPI Insights Space Sector Watch

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SOLUTIONS BEYOND THE EUROPEAN LAUNCHER CRISIS – THE USE OF SPACE



Regarding the "European launcher crisis", the most pertinent question may be how Ariane 5 launch services could be discontinued prior to ensuring Ariane 6 in full service, how therefore Europe today cannot autonomously launch its own critical institutional missions, and how future European missions may be served, considering A6 almost fully booked until 2027, mostly by 18 launches for a commercial U.S. connectivity constellation. The actual **purpose of the launchers** for Europe may not have received the required priority, as European strategy so far focused on the **launcher itself**.

Fortunately, a new level of debate has emerged, on how to transform public procurement, increase industrial competition and stimulate private investment. Such discussions at highest level are very timely, when Europe is faced with the fundamental question of how to position itself in the global space race (ESPI Perspectives March 2023). However, again most of the debate appears to be focused on the launcher and not on its purpose. Launchers are a key element of European technical autonomy to access to space. But they are only a means to an end, to **the use of space**. The launcher sector only represents 1-2% of the global space economy (e.g. SIA/Bryce 2021: 5.7B\$ global launcher revenues/ 386B\$ global space economy). The space economy is build on and will grow with the use of space, with payloads and satellites delivering space-based services (e.g. SIA 2021: satellite broadband & TV alone 98.4B\$). As a consequence, any economically sustainable strategy on future launchers should be integral part of a strategy on the use of space, not vice versa. A European **strategy for access to and use of space** needs to consider all sectors of space, institutional (Space4Earth & Exploration), commercial, and security & defence. Globally, human space flight, commercial and military markets represent about 2/3 of the market for launch services (e.g. Europpace, Launch Services Value 2021 6.3B\$ out of 9.8B\$). SpaceX business model is based on this, beyond launch services to the ISS providing a foundation, 56% of Falcon-9 launches carry Starlink satellites, next to revenues from 30 other commercial launches, including 10 for European operators (2019-22) and with Starshield next, all attractive to private investment.

In the ongoing debate, in almost all cases the U.S. COTS programme is identified as the main reference when transforming also the European eco-system. The COTS programme has been very successful in bringing a fundamental change of development and procurement strategy, by connecting a launcher strategy with a very strong and consistent use for the ISS (resupply, crew). But it is only the combination of the U.S. institutional strategy with the wider commercial strategy of SpaceX that enabled the true revolution in space, with Starlink at the core. Similar may happen once heavy launchers may enable yet another revolution, bringing a new scale to the use of space. Europe has to act decisively:

- to take decisive measures now, to increase the European institutional demand significantly (including and beyond Space4Earth missions only and beyond federating national demand), **including security and space exploration**,
- to enable commercial demand, in domains that are attracting private investment, e.g. space applications. IRIS2, beyond governmental services, needs to become an element of such wider strategy, a European catalyst for connectivity markets expected to triple by 2030, e.g. for handhelds, for airlines and autonomous driving (ESPI Executive Briefs 60 & 61).

Europe has seen unprecedented investments by Venture Capital into the launcher sector, totaling above 500M€ between 2015-2022. However, on a global scale so far this represents only about 3% (17.4B€ of global private funding, led by SpaceX and Blue Origin (ESPI Venture Database). It also represents only a small share when compared to the total VC space investments in Europe of 1B€ in 2022 (ESPI NewSpace Europe 2022). It is uncertain, if the financial markets in the current economic situation, will be ready to scale-up the required significant investments in launchers. **Investors, also beyond VC will require sustainable business cases, understanding the customer base of the launchers and their user markets, with and beyond strong institutional anchor customers**. Also the valuation of SpaceX is predominantly based on Starlink. Space solutions in LEO, new business models in GEO, in-space transportation, Earth observation services beyond governmental use, commercial space stations and research facilities for biomedical advances, for energy and food security can attract **private investments** for the use of space – and with it for launchers.

The challenge for Europe is much wider than on launchers only. Only a dual and demand-driven strategy, including access to and use of space, attractive to investors can avoid the European launcher crisis to turn into a "Space crisis".

Yours sincerely, Hermann Ludwig Moeller Director of ESPI



POLICY & PROGRAMMES

Spain took over the EU Presidency, unveiling priorities on space



On July 1st, Spain took over the Presidency of the Council of the EU until 31st December 2023, succeeding Sweden. The **programme** outlines 4 priorities: (1) reindustrialising the EU and guaranteeing its open strategic autonomy; (2) advancing in the green transition; (3) promoting greater social and economic justice; (4) strengthening European unity. The programme includes a paragraph dedicated to space (p. 33) which outlines the following priorities:

- Adoption of the Council of the EU's Conclusions in relation to space traffic management (STM).
- Continuation of advancing a European policy on space, defining and reinforcing the role of the EU as a major participant in space activities.
- Preparation of the Council of EU's Conclusions on the Space Strategy for Security and Defence.
- Space Summit 2023: the Informal Ministerial Meeting on Space, which includes ESA and EU, will take place in Seville on November 6th-7th, focusing on the sustainable and green use of space, on resilience and on competitive and sustainable industrialisation.

Moreover, space is mentioned in a paragraph on Defence (p. 21), outlining that the access to global commons, such as outer space, cyberspace and the maritime environment, must be guaranteed and that efforts aimed at implementing the EU Space Strategy for Security and Defence and the EU Maritime Security Strategy and its Action Plan will be continued and finally, announcing that the Spanish Presidency will also organise the second Board Meeting at Ministerial Level of the European Union Satellite Centre (SatCen).

Last Ariane-5 launched the French Syracuse 4B and German Heinrich Hertz

On July 5th Europe's Ariane 5 rocket made its 117th and final flight. The Ariane 5 launched satellites for nearly three decades, with a track record of 115 successful missions and only two outright failures. The final launch, designated VA261, took place from the European spaceport in Kourou, French Guiana.

The rocket carried two communications satellites destined for GEO. The first payload deployed was the German Heinrich-Hertz-Satellite, a spacecraft weighing 3.400 kg, designed to test advanced communications technologies. The second payload was the Syracuse 4B satellite, weighing 3.570 kg, intended for use by the French military.



Credit: Arianespace

With the end of the Ariane 5 programme, Europe awaits the arrival of its next-generation rocket, the Ariane 6. Originally scheduled for a 2020 debut, the Ariane 6 had some delays, pushing its first launch into 2024. The delay in the Ariane 6's introduction, coupled with the unavailability of Russian Soyuz launch vehicles and the grounding of the Vega-C after a failure last December, has forced European satellites to rely on American launch services.



ESA's Euclid Mission was launched and successful deployed

On July 1st, **ESA's Euclid mission, the Euclid Space Telescope, was launched with SpaceX** onboard a Falcon 9 rocket from Cape Canaveral. After the launch, a trajectory correction manoeuvre was conducted by ESA mission control to guide Euclid to Lagrange Point 2 to join ESA's Gaia telescope and the NASA/ESA/CSA James Webb Space Telescope (JWST). The \$1.4B Euclid deep space exploration/astrophysics mission aims to study dark energy and matter over ca. 6 years. The Euclid Consortium contributed the two scientific instruments (1) the visible-wavelength camera (VIS) and (2) the Near-Infrared Spectrometer and Photometer (NISP), while NASA provided the detectors for NISP. Following launch and



Credit: ESA

separation from the launch vehicle, **ESA's European Space Operations Centre (ESOC) confirmed that it received signal from Euclid** via the New Norcia ground station in Australia.

ESA and CNES sign MoU to support SpaceFounders



Credit: SpaceFounders

ESA and CNES signed a MoU, committing ESA's support to the SpaceFounders programme, a joint initiative between CNES, ASI and the University of the German Armed Forces (UniBW), which aims to increase the exchange between public institutions and startups to boost the innovative European space industry.

The initiative is furthermore supported by partners such as the German Space Agency (DLR), Airbus Defence & Space, Thales Alenia Space, Beyond Gravity, and ESA. This MoU will kick start ESA's contribution to several areas

of the programme, including selection of startups, contribution to the programme content, expansion of the programme's visibility across ESA member states, co-organisation of events, as well as network engagement with investors and industrial customers.

Space-related security and defence projected funded through the European Defence Fund

Through the EDF, **the European Commission will allocate €19.2M for a research project called REACTS**. The project aims to develop a framework for a resilient and scalable Network of Responsive Space Systems (RSS) for EU Member States. REACTS will define the architecture, concept of operations (CONOPS), roadmap, interface standards, and software-based configuration for the RSS Network. The goal is to launch satellites and deliver data within 72 hours, ensuring a disruptive and collaborative defence capability. ESPI will contribute to the work of the REACTS Consortium consisting of 35 partners.

On June 30th, **OHB system AG (OHB SE subsidiary) led a joint bidding to secure the ODIN'S EYE II project**. In collaboration with 38 European companies from 14 EU Member States, the consortium was awarded a €90M Million grant from the European Commission to build a space-based missile early warning (SBMEW) system. The **project**, funded through the European Defence Fund, will develop a common response to current and future threats.



EU and UK agree to draft agreement for UK's re-entry into Horizon Europe and Copernicus

Following a meeting between UK Prime Minister Rishi Sunak with European Commission President Ursula von der Leyen, the **EU and the UK agreed to a draft agreement for the UK's re-entry into the EU's Horizon Europe and Copernicus Programme**, which UK lost access to in consequence of the Brexit. UK will not re-join Euratom's nuclear energy R&D scheme. Britain formally left the programmes when it formally left the EU in January 2020, and negotiations to re-associate as a third country were ongoing, with talks concerning UK's re-joining in March.

ESA conducted first-of-its-kind "assisted re-entry" of Aeolus spacecraft

On July 28th, **ESA conducted an assisted re-entry – the first-ofits-kind – for the Aeolus spacecraft**, after the completion of its 5years scientific EO mission. Aeolus is the fifth of ESA's Earth Explorer missions, studying wind patterns on Earth, and was launched in 2018, having exceeded its mission lifetime by two years. Initially built to burn up in the Earth's atmosphere naturally at the end of its life, Aeolus was directed through an assisted reentry into the Earth's atmosphere with the remaining propellant. 80% of the Aeolus spacecraft burned up in re-entry, the rest fell harmlessly into the Atlantic Ocean.



Credit: ESA

EUSPA starts operating the SST Front Desk

From July 1st, **EUSPA started operating the Space Surveillance and Tracking (SST) Front Desk**, following the decision of the European Commission in June 2022 and the EU's overarching objective for a holistic approach to Space Traffic Management. The EU SST Front Desk team will continue interfacing with SST users, EU institutions, and EU Member States. The team will support them in using the dedicated Portal and benefitting from their services. The Front Desk also provides service performance information to certain stakeholders and promotes the use of SST services.

ESA explores a wide range of possible in-orbit services



ESA has been exploring IOS as part of its Clean Space initiative, which aims to remove and prevent space debris. **The agency invited industry partners to present their ideas for Europe's first IOS mission**, with a potential launch as early as 2028. The study focused on IOS opportunities for satellites in LEO and GEO orbits. Astroscale, ClearSpace, D-Orbit, and Telespazio in collaboration with Thales Alenia Space were funded to develop their concepts,

and the results were presented during the 2022 ESA Council at Ministerial level in November 2022. The telecommunications industry expressed a strong interest in life extension services, particularly in orbital maintenance, where satellites need to maintain precise positions and orbits over time. The proposals detailed how servicing spacecraft could attach to satellites with depleted fuel and perform necessary orbit adjustments. Once completed, the servicing spacecraft could move on to the next satellite in need. Notably, three out of four proposals came from recently emerged space companies, and ESA's Space Safety programme decided to proceed with two of the proposed missions, with a vision to expand IOS operations' number and capabilities. The aim is to make IOS a common procedure in the European space industry by the early to mid-2030s.



UK unveils Space Strategy in Action & Space Exploration Technology Roadmap

In July, the **UK released the National Space Strategy in Action** (based on the UK National Space Strategy published in 2021) which outlines further direction on the UK's priorities and strategic goals for civil space capabilities. The policy document describes concrete policy steps that are required in order to realise ambitions set out in the National Space Strategy in the shot-term over the next 18 months, moving from the "ignition phase" into the "thrust phase".

In particular, it sets out the next steps in implementing the National Space Strategy across each of its 4 pillars: (1) unlocking growth, (2) collaborating internationally, (3) growing as a science superpower, and (4) developing resilient capabilities. Moreover, the National Space Strategy in Action policy paper sets out a 10 Point Plan:

- "Capture the European market in commercial small satellite launch"
- "Fight climate change with space technology"
- "Unleash innovation across the space sector"
- "Expand our horizons with space science and exploration"
- "Develop our world-class space clusters"
- "Lead the global effort to make space more sustainable"
- "Improve public services with space technology"
- "Deliver the UK Defence Space Portfolio"
- "Upskill and inspire our future space workforce"
- "Use space to modernise and transform our transport system"



Credit: UKSA

Moreover, in line with the UK National Space Strategy and within the framework of civil capabilities as part of the National Space Strategy in Action, the **UK released the Space Exploration Technology Roadmap (SETR)**, which aims to guide the UKSA in decision-making by focusing on technologies in which UK leads or plans to lead. The roadmap mirrors selected technologies that UKSA identified and recommends for the UK to focus on developing for space exploration purposes. It describes the overall role, benefits, current and planned national competence and support requirements for these selected and recommended technologies, while also identifying gaps that need to be addressed.

The identified technologies include Advanced Manufacturing, Autonomy & AI, Communications & Mission Operations, In Situ Resource Utilisation, Life Support & Crew Performance, Navigation &

Sensing, Propulsion, Robotics, Sample Curation, Science Instrumentation, and Space Nuclear Power. The roadmap refers to projects, such as the Lunar Pathfinder to further utilise for ESA's Moonlight project, and the ESA Rosalind Franklin Rover planned to launch to Mars in 2028.

Finally, the UK's Technology Secretary Chloe Smith announced a £20M funding from UKSA for the development of future projects in telecommunications technologies and aerial connectivity. The UKSA invites companies to bid for the funding to develop aerial services and technologies.





June saw several other developments in European space nations

France approved €400B budget for the 7-year Military Programme Law - €6B allocated for space

On July 13th, the French Parliament approved the €400B budget for the 7-year Military Programme Law (LPM) for 2024-2030 with €6B allocated for space programmes (+45% increase), including the new generation of high-resolution optical reconnaissance satellites constellation "Iris", the electronics-intelligence system "Celeste" and an upgrade of the Graves bi-static radar to track objects in LEO. Moreover, the budget includes "Egide", a mission to reinforce France's ability to act in space, national support for IRIS², in which France will invest instead of developing the third Syracuse4 military communications satellite, and - as part of the active space-defence policy - the C4OS ("Command, Control, Communications and Computing Space Operations Center") to manage actions to, from, in and from space. Moreover, the French military plans to reinforce space cooperation, especially within Europe with Italy, Spain, Germany, Greece, Belgium and the UK.

Germany progresses with national space strategy but faces budgets shortages for space in 2024

According to the 2024 Budget Draft, **Germany will decrease the budget for space compared to the 2023 budget** - in order to adapt to the debt brake: \in 313M national space programme (- \in 58M compared to 2023 budget), contribution to ESA Programme for IRIS² \in 70M (- \in 119M compared to 2023 budget of \in 189 Mio), and a budget decrease for DLR R&D of - \in 400M. The budget cuts triggered headwinds from the German space industry (SMEs), **having sent an open letter to German Chancellor Olaf Scholz** which criticises the planned budget cuts. Meanwhile, **Germany is progressing with the development of its national space strategy**, which is planned to be adopted by the cabinet this summer. Core topics of the strategy are New Space and commercialisation, including the creation of a Space Innovation Hub, access to space and launchers, with German microlauncher companies envisaged to contribute to European independent access to space, space for the green transition (sustainability in space, space debris, space for climate), digitalisation, security (in line with the national space strategy and the recently published national security strategy there will be a complementary space security strategy), and space science & exploration. Moreover, a national space law is planned to be established.

Moreover, European Space Imaging (EUSI) announced a € multi-million investment to upgrade its ground station, the Direct Access Facility (DAF), at the German Aerospace Center (DLR) site in Oberpfaffenhofen, in order to improve its satellite imagery delivery ability. In particular, EUSI started downlinking data from the Maxar WorldView satellite constellation using the upgraded DAF. EUSI's ground station is crucial for DLR's participation in EU security programmes and the investment strengthens the long-standing cooperation between EUSI and DLR as well as highlights EUSI's commitment to investing in German space infrastructure.

Portugal invests €9.25M to advance in space capabilities

The **Portuguese government committed a €9.25M funding package** (derived from part of the net results of the Autoridade Nacional de Comunicações (ANACOM) for 2021-2025) for the Portuguese Space Agency for 2023-2027 to accelerate Portugal's ambitions in space and to boost scientific innovation. The allocated funding will be transferred as an annual extra budget to the space agency's overall budget.



Poland contributes €295M of additional funds to ESA

In June, Poland announced to increase its financial contribution to ESA to €295M over the next 3 years to boost the growth of its domestic space sector and secure orders for Polish companies and research institutes in ESA-managed projects through the geo-return. The contribution will be allocated foremost in the areas Earth observation (€85M), space exploration (€100M) and in other key areas, such as satellite construction, satellite navigation and communication, space security, robotics, access to research on the ISS and internships for Polish students and YPs at ESA – with a detailed allocation of the funding to be decided through upcoming meetings including ESA, POLSA, Poland's Ministry of Development and Technology and Polish space industry representatives.

ESA and GSMA join forces for Next-Gen satellite and mobile networks



Credit: GSMA

ESA and GSMA signed a Memorandum of Intent (MoI) to foster collaboration between the mobile and satellite industries and accelerate the development of satellite and terrestrial network technologies. Known as SCARLET- α , the \$7M project aims to strengthen the competitiveness of both sectors by creating an ecosystem that fast-tracks new technology solutions for businesses and consumers. The focus will be on integrating satellite communications with 5G and future 6G networks to drive

advancements and improve connectivity. Central to this partnership is the GSMA Foundry innovation accelerator, which will collaborate closely with ESA's 5G/6G Hub based at ECSAT. The joint effort seeks to capitalise on the increased adoption and integration of satellite technologies by the communications industry, which could lead to potential revenue gains of \$35B by 2035, a 3% uplift on telecommunications industry revenues, according to recent research by GSMA Intelligence (GSMAi).

New Zealand launches "Aotearoa Aerospace Strategy"

New Zealand launched the Aotearoa New Zealand Aerospace Strategy which manifests the country's objective to establish a distinct New Zealand approach to aerospace, combining both aviation and spaceflight, and comprises 3 pillars to underpin its aerospace sector's success: (1) Unlocking aerospace potential; (2) Future-facing Government; (3) Aerospace nation. The three pillars aim to enable the country to achieve 5 goals (thereof 2 solely space-related) for the domestic aerospace sector until 2030:

- Establish a sustainable air-passenger journey
- Safely integrate autonomous aerial vehicles
- Be at the forefront of sustainable space activities
- Actively support exploration in space
- Enhance decision-making using space-enabled data

The required work to achieve these goals is outlined in a staged action plan. Moreover, the government allocated up to \$12M funding to support the implementation of the strategy - in addition to the \$15.7M funding already announced in 2022. More recently, in May, New Zealand released its **Space Policy** and an **Operational Policy for Active Debris Removal (ADR) and On-Orbit Servicing Missions**.



PhilSA and European Commission sign Copernicus Cooperation Arrangement

The Philippine Space Agency (PhilSA) signed the Copernicus Cooperation Agreement with the European Commission. to intensify cooperation in EO through satellite data exchange and advancing the use and application of EO data to address societal and environmental challenges. In particular, PhilSA aims to support pilot projects using Copernicus and to establish a data hub to distribute Copernicus Sentinel data across the country. Moreover, the arrangement will lay the basis for the implementation of an EU-funded (DG INTPA) Copernicus capacity-building programme for the Philippines. The EU's Copernicus Cooperation Agreements are tools for bilateral cooperation between the EU and third states and is part of the Copernicus global outreach strategy, which aims to promote the take-up of Copernicus data and its services in tackling societal challenges globally. The agreement with PhilSA joins similar arrangements of the EU with the international partners U.S., Canada, Australia, Chile, Colombia, Brazil, Panama, Japan, India, Africa (AU), Ukraine and Serbia.

Progress in nuclear space propulsion

As reported in May, **ESA is funding a project called pReliminary eurOpean reCKon on nuclEar elecTric pROpuLsion for space appLications (RocketRoll)**, led by scientists from the University of Prague, the University of Stuttgart, and engineers from OHB Czechspace and OHB System in Bremen. RocketRoll aims to provide an overview of European experience, technology, and industrial capabilities for nuclearpropelled spacecraft development.



Moreover, in June the CEA (Commissariat à l'Energie

Credit: NASA

Atomique et aux énergies alternatives) announced it will conduct new feasibility studies on nuclear space propulsion on behalf of and for ESA. In particular, this the project called Alumni, led by CEA with support of ArianeGroup and Framatome, concerns a nuclear thermal propulsion engine with a concept is based on heating liquid hydrogen by passing it through the nuclear reactor, transforming it into gas and heat it up to high temperature. Then, it can generate thrust with 2-3 times more efficiency than in a chemical engine.

ESA's efforts also align with NASA's own programme, in partnership with DARPA, to develop a nuclear thermal engine and conduct in-space demonstrations as early as 2027. NASA's collaboration with DARPA and commercial leaders like Lockheed Martin will lead the development and testing of the nuclear-powered rocket demonstration. Specifically, in July, Lockheed Martin, under a project named Demonstration Rocket for Agile Cislunar Operations (DRACO), has been awarded a contract by DARPA to develop a nuclear-powered spacecraft for exploration and national defence. The project aims to conduct an in-space flight demonstration of the nuclear thermal rocket engine vehicle by 2027.

The DRACO programme plans to invest nearly \$300M, with two-thirds of the funding allocated for the design and development of a nuclear propulsion engine. DARPA will use high-assay low-enriched uranium (HALEU) fuel for the programme, ensuring the fission reactor remains offline until reaching its target orbit. The U.S. Space Force will provide the launch site for DRACO, further supporting the advancement of nuclear-powered space technologies.





FAA launches committee for commercial human spaceflight safety regulations



Credit: Honeywell

In the light of increasing commercial suborbital human spaceflight conducted by private companies and the recent incident of the **private exploration mission to the Titanic** and its implications private human spaceflight and exploration, July saw an increased debate on the uncertainty about safety regulations for the passengers for suborbital commercial human spaceflights.

On June 29th, Virgin Galactic conducted its first commercial flight of its VSS Unity SpaceShipTwo vehicle with three Italian scientists onboard in the Galactic 01 research mission. Following the successful mission, Virgin Galactic plans to start flights of private astronauts on that vehicle on a monthly basis starting from August. Blue Origin, having started flying customers on its New Shepard suborbital vehicle in 2021, is planning to resume flights in the upcoming weeks. Both companies operate under a regulatory regime by the Federal Aviation Administration (FAA) focused on the safety of the uninvolved public. The FAA's ability to enact regulations for the safety of spaceflight passengers on commercial vehicles is (temporarily) restricted by Federal law.

Later in July, the **FAA launched a rulemaking committee for human spaceflight** comprised of 25 members from government and industry (including commercial spaceflight companies), which aims to examine the development and cost of safety regulations for commercial human spaceflights and establish a regulatory regime for commercial human spaceflight occupant safety, by gathering recommendations from various stakeholders to be submitted to the FAA next summer. Currently, customers of SpaceX, Blue Origin, and Virgin Galactic fly under an informed consent regime in which the companies must disclose the risks involved in orbital or suborbital flights.

July's updates on the ISS

NASA's Mission Control in Houston encountered a brief power loss on July 25th, requiring backup communication with the ISS crew. Joel Montalbano, NASA's ISS programme manager, explained that the power loss occurred during ground operations to upgrade the reliability of the power systems and reassured that the crew was never in danger as a backup command and control system quickly restored communication within 90 minutes.



Credit: NASA

Meanwhile, NASA is moving forward with plans to enhance the ISS's power system by adding two more solar arrays. **Boeing and Redwire signed a contract for a fourth pair of ISS Roll-Out Solar Arrays (IROSA)**, which unfold in space to provide additional power. The IROSA will augment the station's original solar arrays, which have degraded over time, offering more than 20 kilowatts of electricity each. The new arrays are expected to be delivered by late 2025 or early 2026 and aim to ensure the ISS operates at normal levels for future research missions.

Moreover, preparations for SpaceX's Crew-7 mission, scheduled to launch on August 15th, continued as planned, sending four astronauts, including ESA's Andreas Mogensen, to the ISS. Andreas Mogensen will pilot SpaceX's Crew Dragon alongside NASA's Mission Commander Jasmin Moghbeli, JAXA's astronaut Satoshi Furukawa, and Roscosmos' cosmonaut Konstantin Borisov as mission specialists, marking his second space journey. The Crew Dragon capsule will be aboard a Falcon 9 rocket for the seventh crew rotation flight of Crew Dragon.



Venezuela joined China's International Lunar Research Station (ILRS) initiative

Venezuela formally joined the China-led International Lunar Research Station (ILRS) project by signing a joint declaration, becoming the first partner country to formally join. Reportedly, Venezuela will contribute by providing its satellite control ground station infrastructure for lunar missions as well as through technical and operational cooperation as well as data management and exchange. The ILRS project aims to construct a permanent lunar base in the 2030s and was initially present as a Russia-China-led project, having presented a joint ILRS roadmap in 2021. China took the lead of the project and recently set up the coordination organisation ILRSCO. Earlier this year, CNSA signed joint statements on the ILRS with the Asia-Pacific Space Cooperation Organization (APSCO), Swiss firm nanoSPACE AG, and the Hawaii-based International Lunar Observatory Association (ILOA) and received expressed interest from Pakistan and 10 other countries and organisations. China plans to complete the signing of agreements for founding members of ILRSCO by October.

Moreover, reportedly, China is building a 40-metre microgravity experiment facility tower with electromagnetic launch (MEFEL) in Bejing. MEFEL will enable researchers to conduct up to 100 experiments per day, to replicate weightlessness and simulate Moon and Mars conditions.

Russia proposes joint module on Russian Orbital Station for BRICS countries

Russia proposed to create a joint module for the Russian Orbital Station (ROS) to allow BRICS countries participation through conducting scientific research. Reportedly, Russia has already offered African countries the opportunity of participation in the ROS project and the creation of dedicated national modules. In June, Roscosmos revealed details and updates on the ROS Cosmonaut programme, including the planned selection of the first cohort of ROS cosmonauts by next year, and the development of the cosmonauts training programme to be completed by 2025.

ISRO launches Chandrayaan-3 and DS-SAR mission, and transfers SSLV to the private sector

ISRO launched its Chandrayaan-3 mission on July 14th with a the new heavy-lift launch vehicle, the GSLV Mk 3 rocket. Once arrived on the Moon in August, the lunar mission will analyse the lunar regolith, seismicity, plasma environment with scientific instruments. The spacecraft is a composite of three modules, propulsion, lander and rover. The propulsion module will carry the lander and rover as well as an additional payload, the Spectro-polarimetry of Habitable Planet Earth (SHAPE)



Credit: WION

payload, which aims study the spectral and polarimetric measurements of Earth from lunar orbit.

Moreover, ISRO launched the DS-SAR mission on July 30th from Satish Dhawan Space Centre deployed by PSLV-C56. Executed by India's NSIL with ISRO, the mission carries the DS-SAR satellite (and 6 other payloads), developed under a DSTA (Singapore) and by ST Engineering partnership to be used by and for the Government of Singapore and ST Engineering for its commercial customers. DS-SAR carries a SAR payload developed by Israel Aerospace Industries.

Furthermore, ISRO decided to transfer its Small Satellite Launch Vehicle (SSLV) to the private sector. The rocket is specifically designed to cater to nano and micro-satellites, offering ondemand services to place satellites weighing up to 500 kg into LEO. By involving the private sector in SSLV operations, ISRO aims to enhance efficiency in on-demand launch services, eliminating the need for satellite owners to wait for larger rockets or share rides as co-passengers.



UAE continues its multilateral outreach for space cooperation

During Türkiye's President Erdogan's official visit to the UAE, the countries' Presidents **agreed on a joint accord on the establishment of a high-level strategic council between the UAE and Türkiye as well as several agreements valued in total \$50.7B**, fostering their strategic partnership. The 14 agreements aim at diversifying the framework of the UAE-Türkiye Comprehensive Economic Partnership Agreement and deepening investment and include a space-related MoU on the development of joint launch vehicle capabilities for commercial purposes between the UAE Space Agency, the Turkish Ministry of Science, Industry and Technology, and the Turkish Space Agency.

Furthermore, on the 25th anniversary of the establishment of the countries' diplomatic relations, the ambassadors of UAE and Armenia agreed to strengthen economic and trade links, provide support to companies to diversify partnerships and to assist emerging businesses to expand in sectors of common interest, including space and other sectors such as trade, technology, agriculture, food security, tourism & travel, renewables, transport, technological industries and the circular economy.

Moreover, end of June, the UAE's PHI-Demo CubeSat was launched by a Russian Soyuz-2 rocket from the Vostochny Cosmodrome – marking the first mission under the UNOOSA's and Mohammed bin Rashid Space Centre's joint Payload Hosting Initiative.

Japan strengthens space partnerships with the UAE and Saudi Arabia

President of JAXA praises partnership with UAE

Japan is advancing in expanding its international partnerships and bilateral cooperation. In particular, JAXA has been collaborating with the UAE in the aerospace industry. JAXA's President Yamakawa Hiroshi praised the space partnership, recalling the joint efforts in launching KhalifaSat in 2018 and the Emirates Mars Mission's Hope Probe in 2020, using Japan's H-IIA launch vehicles. This collaboration is set to continue, with plans for a science experiment onboard Japan's Kibo Experimental Module to advance future medicines and inspire space education activities within the Asia-Pacific Regional Space Agency Forum (APRSAF) framework, led by JAXA.

MBRSC and IDDK partner to push the frontiers of space biotechnology

The Mohammed Bin Rashid Space Centre (MBRSC) and IDDK, a Japanese biotechnology firm, have **joined forces through a MoU to advance international collaboration and innovation in space science**. The partnership seeks to introduce IDDK's cutting-edge microscopic observation technology and other services to the UAE's scientific community and beyond. The agreement signifies a shared commitment to propel the UAE's standing as a global player in space exploration and technology. The collaboration aims to explore opportunities for commercialising IDDK's services in the UAE, including the development of experimental modules for space experiments and the establishment of in-space manufacturing platforms with safe re-entry capabilities.

Japan strengthening space cooperation with Saudi Arabia

Moreover, Japan is solidifying its bilateral ties with Saudi Arabia. A meeting between Saudi Crown Prince Mohammed bin Salman and Japanese Prime Minister Fumio Kishida resulted in the signing of 26 agreements and MoUs. These agreements cover a wide array of areas, including renewable energy, space, technology, and Al, aligning with the Saudi-Japanese Vision 2030.



Credit: Royal Court of Saudi Arabia



July saw boost of African cooperation in space

In July, there were several news and developments in the African space sector and in cooperation with African countries and space industry. According to Space in Africa, as of June, over \$4.7B were invested by African nations on 58 satellite projects in Africa (manufacturing and launch of satellites) - thereof 55 satellites manufactured by 15 countries across 4 regions.

In July, Côte d'Ivoire announced to launch its first satellite YAM-SAT-Cl 01 (a EO nanosatellite), fully domestically manufactured, within the next 2 years.



Moreover, **Ghana approved a national space policy**, which provides a framework for sustainable development by using and leveraging space science and technology and coordinates the access to and consume of space data for ministries, departments and agencies (MDAs) as well as their cooperation and how the data can support the domestic space sector development. An overarching goal is to restructure the Ghana Space Science and Technology Institute into a space agency. Moreover, the **Angolan Agency for Oil, Gas and Biofuels implemented the TECH-ECOLOGIA solution** developed by National Space Programme Management Office to monitor spill from space.

Furthermore, July saw bilateral agreements for space cooperation:

Rwanda signs MoU with Esri to boost geospatial services for social-economic development

During the 2023 Esri User Conference in the U.S., the **Rwanda Space Agency (RSA) and Esri signed a MoU** to launch a partnership and create a framework enabling the provision of geospatial services to boost social-economic development in Rwanda. The agreement supports the RSA's mission to increase the use of space and GIS solutions for the socio-economic development in Rwanda.

Kenya Space Agency and TomorrowNow.org cooperate in space for agriculture in Kenya

The Kenya Space Agency (KSA) and TomorrowNow.org signed a Letter of Intent to launch a cooperation to utilise space data in order to enhance food security and climate change adaption for better decision-making in agriculture in Kenya.

Ghana and Tunisia sign New Space Cooperation Agreement

The Ghana Space Science and Technology Institute (GSSTI) and the Tunisian Space Association signed a partnership agreement for cooperation to advance the countries' space sectors development and for future cooperation space research, development and training. Areas of mutual interests are astronomy and EO, data-sharing for augmenting EO applications for environment management, precision agriculture, land use, air pollution, mining, forest management, and coastal area management. Ghana envisages to support Tunisia in driving radio astronomy capabilities, while Tunisia aims to strengthen space education with Ghana.



The China-Africa Cooperation Centre on Satellite Remote Sensing Application Takes Off

China has been playing a proactive role in Africa, particularly with its efforts in satellite remote sensing and space cooperation. Recently, **the China-Africa Cooperation Centre on Satellite Remote Sensing Application was inaugurated by the Ministry of Natural Resources of China**. This programme aims to create a data-sharing platform and utilise remote sensing technology to monitor natural resources in coastal zones and mangroves across the African continent. Delegates from various African states, including Cabo Verde, Egypt, Ghana, Kenya, Rwanda, and South Africa, attended the event.

During the inauguration, **Egypt's Space Agency (EgSA)**, **led by CEO Dr**. **Sherif Sedky**, **signed a MoU with the Chinese Land Satellite Remote Sensing Application Centre (LASAC)**. The agreement aims to enhance Egypt's access to remote sensing data, enabling more informed decision-making. As part of the collaboration, training opportunities will be provided to effectively utilise the remote sensing data, further bolstering Egypt's capabilities in this field.



Credit: EgSA

Further advancing their space cooperation, EgSA hosted President Zhang Zhongyang and his delegation from China Aerospace Science and Technology Corporation (CASC) at their HQ. The meeting focused on strengthening space cooperation and exploring joint projects, emphasizing mutual technological advancements in space exploration. Sherif Sedky also shared news about Egypt's upcoming satellite launches.

After successful testing in Germany, **Nexsat-1 is scheduled for launch from China in November or December 2023**. Additionally, EgyptSat-2, the nation's second Earth remote-sensing satellite, is set to be launched in October. Sedky discussed these plans with the Egyptian Prime Minister Mostafa Madbouli, underscoring EgSA's commitment to advancing remote sensing capabilities and promoting African participation in space projects through the African Space Agency.

Iran to export space products to ECO members and signs MoU with Pakistan

During the Ministerial Summit of the Economic Cooperation Organisation (ECO) hosted by Iran's Ministry of Communications and Information Technology (ICT), the Iran Space Agency (ISA) stated that it discussed with ECO members states about potential export of space products by Iran to these countries. Moreover, during the third meeting of the Economic Cooperation Organisation (ECO) member states' telecommunication ministers, **Iran and Pakistan sign MoU on cooperation in areas including ICT and space** as well as infrastructure, platforms and messengers, data and post finance.



In other news

Argentina signs Artemis Accords: Argentina is now the 28th country to sign the Artemis Accords, and the fifth country that joined in the last three months, succeeding Ecuador and India having joined in June, and the Czech Republic and Spain in May.

ESA inaugurated new Telemetry, Tracking, and Control (TT&C) facility for Galileo: The new facility is based in the Guiana Space Center in Kourou beside the TTCF-2 facility and aims at enhancing the ground segment capabilities to support the Galileo satellite constellation.

The UK Space Command establishes JCO-UK unit to boost global Space Domain Awareness: The new UK Space Command cell is integrated within the U.S.-led "Joint Task Force-Space Defense Commercial Operations Cell" (JCO) Global initiative, which aims at enhancing the global understanding and use of data in support of Space Domain Awareness (SDA) and will assist it with the JCO's "follow-the-sun" model.

CNES created a Space Mission Ethics Committee: **the committee** to start work in fall 2023 with the tasks to inform CNES' governing bodies on questions of ethics relating to space, in particular, related to the evolution of the NewSpace industry and the commercialisation/privatisation of space.

Swedish Space Corporation (SSC) signed a partnership agreement with the Latvia-based Ventspils University of Applied Sciences (VUAS) and VIRATEC: the SSC aims to add a new partner side in Latvia and VUAS' large antennas to the SSC's global SSC CONNECT network of lunar stations, which SSC is expanding to meet the increasing market demand.

China starts with construction of the Very Low Earth Orbit (VLEO) satellite constellation: According to the China Aerospace Science and Industry Corporation, the EO satellite constellation will consist of 300 satellites with the first scheduled to launch in December 2023. Reportedly, the lower orbital altitude enables "near observation" instead of "remote sensing", which lowers cost, provides higher resolution, and shorter transmission delays with a planned global fast response capability within 15 minutes.

Russia opens Sfera project for international cooperation: According to Roscosmos, Russia seeks for partners to join the Sfera project, which aims to create a satellite constellation system for communications and EO, planned to consist of 5 communication satellites and 5 EO satellites. The programme's first satellite Skif-D was already launched in October 2022.

Germany releases first strategy on China: space mentioned briefly in the chapter on international cooperation, highlighting China's increasingly activity in developing capabilities in space. It outlines that Germany, in cooperation with partners, is analysing these capabilities and Chinese behaviour and will coordinate implications for its own security interests, reiterating the validity of international law. In particular, Germany is closely monitoring the Beidou system, its potential use in combination with other technologies for repression, surveillance and censorship.



INDUSTRY & BUSINESS

ESA selects Thales Alenia Space for SOLARIS initiative



Thales Alenia Space has been selected by ESA for the **SOLARIS initiative** to explore the feasibility of spaceborne solar power plants providing clean energy to Earth. The goal is to achieve Europe's net-zero emissions target by 2050 through renewable and controllable energy sources. The consortium led by Thales Alenia Space aims to harvest solar energy in orbit, eliminating weather and nighttime limitations, and subsequently transmit it to Earth.

Credit: ESA

Thales Alenia Space will lead the feasibility study, exploring new concepts, such as high-efficiency space solar panels,

wireless power transmission, and robotised assembly in orbit, to enable solar energy transmission from space. The SOLARIS studies will help Europe decide by 2025 whether to proceed with the development of space-based solar energy, starting with a small-scale in-orbit demonstrator.

Thales secures contracts with ESA for Galileo Second Generation (G2G)

Thales, in collaboration with ESA, has been awarded two contracts worth over €60M to bolster the cybersecurity of the Galileo Second Generation (G2G) programme. Thales will be responsible for the security and resilience of G2G, ensuring robust protection against cyber threats, including guantum threats, contributing to the greater security of satellite systems. The first contract focuses

on security monitoring for the G2G system infrastructure, while the second contract deals with addressing new threats from quantum computers capable of compromising data security.

Additionally, Thales Alenia Space secured contracts worth over €300M for the design and construction of the G2G Ground Mission Segment for system engineering and technical support activities. This ground mission segment will generate and connect navigation services to Galileo positioning, satellites, improving navigation, and synchronisation for over 4 billion users worldwide.



NASA awards \$150M contracts for lunar mission technologies

NASA awarded 11 companies with contracts totalling \$150M to advance technologies for lunar missions and commercial use. Among the companies, Astrobotic received \$34.6M to develop its LunaGrid project, focusing on solar power generation and transmission to spacecraft on the lunar surface. Zeno Power secured a \$15M award to work on a radioisotope power system, using a Stirling engine to convert radioactive decay into electrical power, enabling lunar missions to function during the lunar night. Other winners include Blue Origin, Redwire, United Launch Alliance, Varda Space Industries, Big Metal Additive, Freedom Photonics, Lockheed Martin, ProtoInnovations, and Psionic.



Blue Origin plans to expand operations to Europe and beyond

Blue Origin aims to establish an international launch facility and is actively seeking acquisitions and partnerships outside the U.S., particularly in manufacturing and software. The company is looking for new partnerships in Europe, seeing it as an opportunity to tap into the region's pool of space professionals and acquire new talent. Blue Origin sees Europe as a promising market with potential for expansion, as it faces the challenge of increasing launch cadence to meet customer demand and to handle its biggest competitor SpaceX.

Yahsat Group invests \$100M in Next-Generation satellite programme

The Abu Dhabi-bases Yahsat Group **plans to allocate over \$100M for capital expenditures this year as part of its "T4-NGS" satellite programme**. This aims to launch the next-generation telecommunications system for Thuraya in H1 2025, with a total cost of up to \$550M, covering manufacturing, launch, insurance, and new ground infrastructure. The capital injection will bolster Yahsat's satellite fleet, with plans to launch two new satellites, "Yah 4" and "Yah 5," catering to fixed satellite communication services. These satellites will enhance capacity and support the government under a capacity services agreement expiring in November 2026.

OHB and Satellogic sign MoU for sustainable EO services

OHB SE signed a MoU with Satellogic Inc. to explore collaboration in the development of EO services. The partnership aims to promote sustainability and environmental protection through the use of EO data. OHB plans to enhance its capabilities by leveraging Satellogic's growing constellation of high-resolution EO satellites. The collaboration will focus on downstream applications and drive the adoption of EO imagery and value-added services in various sectors, including agriculture and urban solutions.

Rivada Space Networks launches satellite constellation plan



Credit: Rivada Space Networks

The German **Rivada Space Networks received a waiver from the ITU's Radio Regulations Board**, which exempts the company from the requirement to launch 10% of its satellite constellation into orbit this year. The ITU waiver process evaluates various criteria such as funding, manufacturing and launch contracts, and coordination with other systems.

After reviewing the submission made by Liechtenstein's telecommunications regulator and filing administration (the "Amt für Kommunikation"),

the ITU Radio Regulations Board determined that Rivada can proceed with its deployment. The company plans to deploy 144 satellites, along with 6 in-orbit spares, by June 2026, and an additional 144 satellites with 6 in-orbit spares by September 2026. Rivada Space Networks envisages to launch a total of 600 satellites and complete the constellations by 2028, complying with the ITU's timeline. Rivada aims to build the OuterNET, a private global network, enabling ultra-secure communications anywhere on the globe by transmitting data exclusively through space, rather than terrestrial networks.



OHB Sweden and ESA sign €32.5M contract for the Arctic Weather Satellite Programme

OHB Sweden and ESA signed a €32.5M contract for the Arctic Weather Satellite programme. The collaboration aims to improve weather forecasts in polar regions and globally, leading to a constellation of satellites based on the InnoSat platform developed by OHB Sweden.

OQ Technology secures ESA contract for ERMIS mission

OQ Technology, a leading provider of space-based communications services, has been awarded a €1.1M ESA contract to develop and demonstrate advanced small satellites as part of the Hellenic Cubesat Demonstration Mission (ERMIS). The project, also funded by the EU's NextGenerationEU programme and the Greek Ministry of Digital Governance, is led by the National and Kapodistrian University of Athens and aims to showcase key space connectivity capabilities in Greece's national small satellite programme. OQ Technology Hellas, a subsidiary of OQ Technology, will design and build two cubesats, ERMIS-1 and ERMIS-2, which will host multiple payloads to enable 5G internet-of-things non-terrestrial network (5G-IoT-NTN) connectivity. The satellites will also incorporate Inter-Satellite Link (ISL) technology to enhance coverage and performance. Additionally, in collaboration with the University of Athens, OQ Hellas will develop ERMIS-3, which will demonstrate an optical communications link and hyperspectral Earth observation data for precision agriculture.

Thales Alenia Space to launch the "Space Business Catalyst" accelerator

On July 4th, **Thales Alenia Space plans the launch of a new type of accelerator, the Space Business Catalyst**, which aims at fostering the development of disruptive projects by supporting entrepreneurs and start-ups. The project aims to provide the opportunity to build strategic collaborations, enhancing early growth and helping implement scale-up strategies and is characterised by an agile structure.

OneWeb partners with Momentum, Eutelsat & Connecta to expand connectivity



Momentum, a Canadian provider of enterprise connectivity solutions, formed partnerships with OneWeb and Eutelsat to bring high-performance connectivity to oil and gas projects in North and

South America. Through the enhanced agreement, Momentum leverages OneWeb's satellite fleet alongside Eutelsat's ADVANCE global connectivity solution, delivering real-time remote control, monitoring, and secure communication services for critical infrastructure. By integrating services from both satellite providers, Momentum offers a comprehensive suite of enterprise connectivity solutions with high-speed, low-latency capabilities, ensuring reliable data transfer for remote oil & gas operations. The partnership supports the growing demand for real-time data, enabling operators to effectively manage operations, communicate with crews, and monitor sites.

In another joint effort, **OneWeb teamed up with the American Connecta Satellite Solutions to provide high-speed, low-latency broadband connectivity across the U.S. and Caribbean territories**. Through this partnership, Connecta will offer a wide range of OneWeb-powered connectivity solutions to enterprise and government customers in these regions, leveraging OneWeb's cutting-edge LEO technology. With this collaboration, the two companies aim to bring broadband services to unconnected and underserved areas and to expand the reach of satellite connectivity, contributing to a more connected and digitally inclusive future.



Spire Global collaborates with ESA, RDC Aviation and Cloudeo

Spire Global has been awarded a €16M contract by ESA for the EURIALO project, aimed at developing a cutting-edge satellite constellation for real-time global aircraft surveillance. Spire will lead a consortium of industry players, including ESSP, to design, demonstrate, and operate the innovative system that will track aircraft using multilateration technology (MLAT) based on radio frequency signals. The project aligns with the European Air Traffic Management Master Plan's strategy for safe and efficient air travel, offering a space-based solution to complement existing surveillance systems and enhance aviation safety and security.

Moreover, Spire Global has also been selected by RDC Aviation to supply global flight and aviation insights. Spire's Flight Report will offer comprehensive data, combining satellite and terrestrial ADS-B positions, to provide valuable flight, aircraft, and airline metadata. RDC will integrate Spire's data into its Airport Charges product, enabling the analysis of airport user charges and en-route navigation costs for over 3,000 airports worldwide. Additionally, Spire's data will enhance RDC's market intelligence product Apex, refining route profitability calculations with accurate flown data.

Simultaneously, Spire Global partnered with Cloudeo to offer weather data to over 34,000 EO experts worldwide.

Viasat partners with ESSP for Iris air traffic modernisation programme



Credit: ESSP

Viasat, following its acquisition of Inmarsat, entered a longterm contract with the European Satellite Services Provider (ESSP) to designate them as the Service Provider for the Iris air traffic modernisation programme, a collaboration between ESA and Inmarsat. ESSP will lead the commercialisation of Iris, offering digital satellite communications to complement congested VHF data links, enabling more fuel-efficient flight routes and enhanced collaboration between pilots and air traffic controllers. This aims to maximise airspace utilisation, and lower emissions

through 4D Trajectory-Based Operations. The programme also aims to unlock an 8-10% reduction in CO2 emissions from improved air traffic management.

Orion and Microsoft partner for NEXUS Space Network

Orion Space Solutions and Microsoft joined forces to develop the NEXUS Electromagnetic Data Mesh Network for Combined Joint All-Domain Command and Control (CJADC2), also known as the NEXUS Space Network. This collaboration marks an important step towards improving data interoperability and synchronised decision-making among Joint Forces, as well as allied and partner nations. The NEXUS space network introduces an innovative cross-domain cognitive electromagnetic data mesh, granting improved access to key information for the U.S. Department of Defense and coalition forces. By integrating Orion and Microsoft's secure NEXUS Electromagnetic Data-as-a-Service (EDaaS) capabilities, this partnership empowers the CJADC2 initiative by providing a unified cross-domain identity across the Microsoft Azure Government and Azure Commercial environments. The EDaaS mesh network developed by Orion aims to provide combined interoperability to the U.S. Government and its allies, establishing a foundation for future on-orbit space quantum collaboration.



Virgin Galactic announces crew for 'Galactic 02' commercial spaceflight

Virgin Galactic Holdings, Inc. announced the crew for its upcoming spaceflight, 'Galactic o2', planned for August 10th. The spacecraft VSS Unity will carry three private passengers to space. The crew comprises 80-year-old Jon Goodwin, a pioneering Virgin Galactic ticket holder and Olympian, along with Keisha Schahaff and Anastatia Mayers, a Caribbean mother-daughter pair who won their seats through a fundraising draw by non-profit Space for Humanity. The spaceflight will also mark the first-time astronauts from the Caribbean, a mother-daughter duo, and an Olympian venture into space, demonstrating Virgin Galactic's commitment to expanding access to space.



Credit: Virgin Galactic

SDA opens bidding for 100 satellites to expand LEO constellation

The U.S. SDA **opened bidding for 100 new satellites to expand its LEO constellation**, aiming to provide high-speed and high-volume data communications for military users worldwide. On April 2nd SDA has already launched its Tranche 0 satellites and plans to launch the Tranche 1 constellation in 2024. Two contractors will design and build the "Alpha" variant of SDA's Tranche 2 Transport Layer satellites, with the first four scheduled for launch in September 2026. The Transport Layer will consist of 300 to 500 interconnected satellites that enable low-latency data transmission and will also include missile warning and missile tracking satellites.

Northrop Grumman faces \$36M charge on NASA lunar Gateway contract

Northrop Grumman faced a \$36M charge on its NASA lunar Gateway module contract due to evolving mission requirements and economic challenges. The charge was attributed to cost growth on the Habitation and Logistics Outpost (HALO) module, an element of the Gateway. HALO, based on Northrop's Cygnus cargo spacecraft, will provide living accommodations and docking ports for visiting spacecraft and landers. The Gateway programme has undergone changes, including launching HALO and the Power and Propulsion Element (PPE) together on a Falcon Heavy rocket. Challenges include addressing technical issues and lack of experience operating in cislunar space and Northrop Grumman is working with NASA to manage these changes effectively.

Nokia Bell Labs deploys cellular network on the Moon



Credit: Nokia Bell Labs

Nokia Bell Labs is set to deploy the first cellular network on the Moon, demonstrating its capabilities for future lunar and Martian missions. The project is part of NASA's Tipping Point initiative, fostering commercial space technologies. Partnering with Intuitive Machines and Lunar Outpost for the IM-2 lunar mission, Nokia developed a space-hardened 4G/LTE microcell to survive the Moon's extreme conditions.



Advanced Navigation receives \$5.2M grant from ASA for lunar exploration



The Australian-based Advanced Navigation has been awarded a Moon to Mars Initiative: Demonstrator Mission Grant by the Australian Space Agency. The AUD \$5.2M grant (€2.15M) will support the development of their LiDAV technology, advancing lunar exploration as part of NASA's Commercial Lunar Payload Services programme, in collaboration with the US-based space systems company

Intuitive Machines. The project, named LUNA (Laser measurement Unit for Navigational Aid), will deploy a space-qualified LiDAV sensor on Intuitive Machines' Nova-C lander during the final descent to the lunar surface. This will enhance autonomous landing manoeuvres, provide reliable navigation on the lunar surface, and drive progress in space exploration. The demonstration on the Nova-C lander will enable commercial availability by 2025-26, contributing to safer and more reliable lunar missions. Collaborations with Australian Astronomical Optics and Transparent Earth Geophysics will further enhance LUNA's capabilities and explore potential applications in airborne gravimetry and precision navigation.

KSAT choses CPI Vertex Antennentechnik for lunar communications network

KSAT has chosen the German company CPI Vertex Antennentechnik GmbH to provide three purpose-built 20m diameter antenna systems for the lunar communications network. These antennas will be strategically located to ensure continuous lunar coverage. The first antenna system is expected to be operational by the end



Credit: KSAT

of 2025, with the entire network slated for completion by the end of 2026. KSAT Lunar's 20m network will offer telemetry, tracking and command (TT&C), payload downlink, and ranging services in both X-band and Ka-band frequencies. After a year of planning, the KSAT lunar team engaged in close dialogue with customers, defining antenna performance requirements to establish a global network for lunar communications. To support lunar missions and emerging markets, KSAT actively selects optimal locations for comprehensive communication coverage throughout all stages of lunar missions, from launch to Earth return.

GomSpace, Terma, Spire Global and OceanMind preserve marine environments

GomSpace and Terma, two leading companies in the Danish Space Industry, **signed a MoU to jointly develop a solution for an Asian project focused on monitoring and safeguarding national waters**. The solution aims to address issues such as illegal fishing, pollution, and other forms of environmental damage within the country's Economic Exclusion zone.



Credit: National Geographic

In a similar vein, Spire Global, Inc. extended its agreement with OceanMind to provide real-time automatic identification system (AIS) vessel-tracking data. By integrating Spire's suite of AIS solutions into its platform, OceanMind seeks to identify suspected illegal fishing activities worldwide, offering actionable insights to enforcement officials and streamlining investigations.



Amazon will invest \$120M for satellite processing facility in NASA's Kennedy Space Center

Amazon unveils its plan to invest \$120M for a satellite processing facility located at Space Florida's Launch and Landing Facility (LLF) at NASA's Kennedy Space Center. The facility is envisaged to be used to prepare the satellites for its Project Kuiper internet constellation for launch aboard rockets from ULA and Blue Origin.

Rocket Lab's "Baby Come Back" mission

Rocket Lab, an American global leader in launch services and space systems, launched its **"Baby Come Back" mission, which deployed seven satellites into space and included an attempt to recover the rocket's booster after launch**. Taking place from Rocket Lab Launch Complex 1 in New Zealand on July 17th, this mission marked Rocket Lab's 39th Electron launch. The "Baby Come Back" mission had the plan to conduct a marine recovery of Electron's first stage. Rocket Lab's recovery team retrieved



Credit: Rocket Lab

the first stage using a custom vessel and transported it back for analysis, contributing to the company's ongoing recovery and reuse programme. The mission is also a rideshare, carrying satellites for multiple customers: notable payloads include NASA's Starling mission, Space Flight Laboratory's Telesat's LEO 3 demonstration satellite, and the Global Navigation Satellite System Radio Occultation payloads from Spire Global.

PLD Space secures PERTE grant for MIURA 5 microlaunchers

PLD Space, along with a consortium of partners, **secured the aerospace PERTE grant to develop a micro launcher**, **MIURA 5**. With the grant, PLD Space can expedite the process and offer space access services commercially. The consortium comprises various companies including Aciturri, AIRBUS, Air Liquide, ALTER, Anteral, Applus, Caye, CECOM, CMASA, Deimos, INSYTE, LOGO 2, Special Machining, OCCAM, Repsol, Swagelok, Talleres Ramón Clemente and Tecno Lanema. They will provide support for the development and production of MIURA 5, which aims to be the first private orbital rocket launcher in Europe.

Orbex expands facilities for Prime rocket launch



Orbex, a UK-based spaceflight company, is expanding its facilities in Scotland and Denmark by more than 30% to prepare for the launch of its Prime rocket. The expansion includes adding 1.500 square meters of factory and office space in Forres, Scotland, and Copenhagen, Denmark. The

new facilities will house a software laboratory and an avionics clean room with ISO 8 and ISO 9 sections. Orbex's Prime rocket has received significant funding through a successful Series C funding round, raising £40.4 million. It has also gained recognition from government officials and space agencies, securing multiple commercial launch contracts with satellite manufacturers. The Prime rocket is designed to launch small satellites into polar and sun-synchronous orbits, it is reusable and engineered to minimise debris, leaving zero waste on Earth and in orbit. Additionally, it uses renewable propane as fuel, resulting in a carbon footprint up to 96% lower than traditional launch vehicles. The rocket's launch will take place from Sutherland Spaceport, managed by Orbex under a fifty-year lease with the potential for a 25-year extension.



UniSQ launches \$180M iLAuNCH trailblazer programme

The University of Southern Queensland (UniSQ) announced the Innovative Launch, Automation, Novel Materials, Communications, and Hypersonics (iLAuNCH) Trailblazer programme in partnership with the Australian National University and the University of South Australia. This AUD \$180-million initiative (€108M) will focus on conducting research, commercialising technologies, and advancing manufacturing capabilities in the space industry over a four-year period. One of the projects under iLAuNCH is the development and deployment of a Mobile Mission Operations Centre that will provide support for launch services in remote areas. The programme aims to foster collaboration between academia and industry and is supported by over 20 industry partners, including Boeing Defence Australia, Leonardo Australia, and Northrop Grumman.

SmartSat CRC launches \$7M project for AI-driven autonomous spacecraft

The SmartSat Cooperative Research Centre (SmartSat CRC) embarked on an AUD \$7 million project (\in 4.23M) to develop autonomous spacecraft using AI. Known as SCARLET- α , the three-year initiative brings together eight partners, including Airbus, Asension, Deakin University, and Leonardo Australia, among others. SCARLET- α aims to create autonomous algorithms that enable small and distributed spacecraft to make independent decisions, optimise resource utilisation, adapt to changing conditions, and handle critical situations without intervention from Earth. The project goal is to expand the role of AI technologies in space and will focus on key areas such as onboard processing and actionable intelligence, small spacecraft and constellation resilience, dynamic optimisation of constellation resources, and real-time tasking and resource allocation.

Comtech wins \$30M contract to provide U.S. army communications

Comtech secured a \$30M contract from Fairwinds Technologies LLC to supply its Troposcatter Family of Systems (FOS). With its software-defined nature allows to enhance U.S. Army Beyond-Line-of-Site (BLOS) communications capabilities and support military operations, disaster response situations, and emergency communications restoration events. The FOS can continuously evolve over time to meet emerging government and commercial use cases, enabling smart-enabled networks in diverse global markets.



Credit: Comtech

Sierra Space secures \$22.6M Air Force contract

Sierra Space secured a \$22.6M Air Force contract to further develop its VR35K-A engine, for upper stages of future launch vehicles. The engine utilises liquid hydrogen and liquid oxygen propellants, providing 35.000 pounds-force of thrust, with high efficiency and performance demonstrated during recent tests. Once completed, the VR35K-A could increase payload mass to orbit by up to 30%, benefiting Sierra Space's applications, destinations sectors, and space transportation, including the Dream Chaser spaceplane.



Libre Space Foundation signs €2M contract with ESA for PHASMA project



Credit: Libre Space Foundation

The Greek company Libre Space Foundation signed a €2M contract with ESA on the PHASMA project, which involves the design and development of three open-source CubeSats. The mission's primary objective is to oversee and analyse the electromagnetic spectrum's usage in space. Through these CubeSats, the experiments will employ AI to analyse terrestrial radio frequency transmissions.

This will enable quantification of global spectrum use, identification of interference sources, and detection of signal transmission violations. Moreover, PHASMA's CubeSats will also monitor signal transmissions from other satellites, contributing to faster and more accurate satellite identification and tracking. This will enhance SSA

and offer valuable insights into the ionosphere and navigation systems like GPS, Galileo, BaiDu, and GLONASS.

CyberOps secures \$2.5M contract for Australia's space cyber security

Adelaide-based CyberOps secured a \$2.5M contract with Australia's Department of Defence to bolster the nation's space cyber security. The agreement entails building a state-of-the-art cyber testing and training facility in South Australia, fostering skill development for space operators and cyber practitioners, while also enabling testing of new space hardware and services.

Fleet Space Technologies acquires European frequency filings

The Australian company Fleet Space Technologies acquired long-term frequency filings in Europe. With this acquisition, Fleet gained operational control over existing frequency assets, enhancing its substantial holdings of mission-critical resources. The filings, secured through the ITU, ensures priority access to radio frequency spectrum for its Fleet's networks.



Credit: Fleet Space Technologies

China achieves 10Gbps/s satellite-to-ground laser communications

China's Aerospace Information Research Institute (AIR) and Changguang Satellite Technology achieved an advancement in satellite-to-ground laser communications. Using their self-developed 500-millimeter-diameter ground system and the Jilin-1 satellite, they achieved a speed of 10 gigabytes per second. The satellite payload data obtained meet the requirements for commercial applications, indicating China's progress towards the era of 10Gbps/s satellite-to-ground communication. The team at AIR planned the satellite-to-ground collaboration task and conducted bidirectional laser signal acquisition, stable signal chain building, and adaptive optical correction. This will provide technical services across various applications as it resulted in high-speed and highly reliable satellite-to-ground laser communications.



Rivada Space Network joins MEF and collaborates with IEC Telecom

The German **Rivada Space Network became a member of MEF**, a global telecommunications industry association focused on enterprise digital transformation. Through its association with MEF, Rivada aims to contribute to networking standards and certifications, allowing businesses to explore the potential of digital transformation and benefit from next-generation LEO satellite systems.

Furthermore, through a **MoU with the French company IEC Telecom**, Rivada is actively working on innovative connectivity solutions for land and maritime communications. Their joint initiative involves the development of "OuterNET," a low-latency, global point-to-point connectivity network powered by advanced LEO satellites featuring inter-satellite laser links and onboard data routers to create a secure optical mesh network in space. IEC Telecom plans to leverage Rivada's OuterNET to enhance humanitarian coordination. Additionally, the integration of OuterNET with IEC Telecom's maritime ICT infrastructure is expected to contribute to global digital decarbonisation by optimising onboard operations and reducing fuel consumption.

AAC Clyde Space wins £1.25M from Kawa Space for EPIC LINK Satellite

The British company AAC Clyde Space won a £1.25 million order from the Indian Kawa Space for a 6U EPIC LINK satellite and its payload, with delivery expected in the fourth quarter of 2024. With the EPIC LINK satellite project, both companies will contribute to the enhancement of ocean monitoring capabilities and the sustainable management of marine resources. The primary objective of this project is to showcase the technology required for a future satellite constellation that will support Kawa Space's existing ocean monitoring platform. By utilising the data collected by the satellite, Kawa Space aims to monitor cargo ship routes and combat illegal, unreported, and unregulated fishing activities.

Share My Space and Hiscox unite to create a safer space environment

The French start-up Share My Space and the global insurance provider Hiscox have signed a MoU to address the challenges posed by the increasing number of satellites and collision risks. Share My Space's advanced tracking and monitoring capabilities will be utilised to provide accurate data for risk assessments and customised insurance solutions by Hiscox. This collaborative approach will minimise accidents and their impact on the space environment. The collaboration will cover the entire lifecycle of space operations, from the critical Launch and Early Operation Phase (LEOP) to the Operational Phase.

SPACECIALIST and RIDE! collaborate to enhance space launch services

RIDE! and SPACECIALIST formed a partnership to provide a comprehensive solution for all pre- and post-launch service agreement (LSA) requirements. RIDE! will manage various pre-launch services, including analysing constellation launch opportunities, facilitating rideshare and launch opportunity brokerage LSAs, negotiating backup launch options and coordinating launch provider requirements. Additionally, they will provide post-launch services involving satellite insurance,



technical and logistics support, as well as on-site tests and integration activities. SPACECIALIST will act as RIDE's agent, offering personal follow-through and mission management services throughout the process.



In other news

AALTO HAPS and Paradise Mobile signed a MoU: they aim to introduce HAPS-based solutions in the Caribbean region, enabling Paradise Mobile to offer services with extensive coverage provided by HAPS and Zephyr, AALTO's solar-powered aircraft.

Orbital Composites has been awarded a Phase 1 STTR contract by SpaceWERX: the goal is to explore In-space Service, Assembly, and Manufacturing (ISAM) capabilities, focusing on active debris remediation to address the issue of orbital debris and strengthen U.S. national defence.

SmartSat and ESA signed an agreement: the aim is to focus on onboard intelligence for EO applications and advanced AI capabilities using hyperspectral satellite imagery foster knowledge specialising in Onboard AI and Synthetic Aperture Radar.

GMV and Galician Innovation Agency (GAIN) are collaborating on a cybersecurity system: the goal is to protect the Rozas Airborne Research Center (CIAR) and UAVs' satellite communication.

UK-based Filtronic PLC secured a €3.6M contract from ESA: the objective is to develop advanced mmWave products for space payload communication systems. The final hardware is expected to be delivered by March 2025.

Luxemburg-based OQ Technology and Saudi Aramco signed a MoU: they combined their technologies for automation and satellite IoT connectivity, aiming to accelerate IoT applications and create investment opportunities in various industries.

Astrocast and Airbus extended their partnership: the collaboration will enhance satellite IoT technology, enabling Astrocast to offer more reliable and cost-effective solutions to customers.

The Mongolian government granted SpaceX two special licenses to operate as a satellite service provider: this will allow millions of internet users in the country to access high-speed internet via Starlink's network of LEO satellites, offering connectivity even in remote regions.

Voyager Space and NewSpace India Limited signed a MoU: they seek to collaborate on spacecraft launch and deployment opportunities using SSLV and PSLV.

Hypergiant won \$61M contract to develop JERIC2O: the user interface for the Department of the Air Force's Advanced Battle Management System will offer real-time integration and enhanced decision-making capabilities.

OneSat's European-developed robotic arm system passed qualification for space launch: the system for fuel-efficient orbit control is a partnership between ESA, CNES, and Airbus and optimises xenon fuel consumption by positioning plasma thrusters far from the satellite's body.

Muon Space awarded \$400.000 contract: it delivers space weather data to U.S. Space Force and expands customer base within DoD, using its space-based prototype microwave sensor.

Profen and SES partner for O3b mPOWER satellite connectivity: the deployment of SES's O3b mPOWER gateway in Türkiye will enhance digital infrastructure, provide secure networks, and enable services like mobile backhaul, disaster recovery, and private 5G. The O3b mPOWER system, with six satellites, is expected to be operational by Q3 2023.

Indian Skyroot Aerospace and French Promethee partner for satellite constellation launch: Skyroot will launch Promethee's constellation on its currently developed Vikram launcher.



INVESTMENT & FINANCE

The Space Foundation estimates that the space economy reached \$546B in 2022

The Space Foundation **released its annual figures** regarding the state of the Global Space Economy for the year 2022 in the second quarter of its Space Report 2023. Despite recent events, such as inflation, which putted pressure on the space economy, the global space economy in 2022 was valued at \$546B, representing an 8% increase year-on-year. The Space Foundation anticipates that the global space economy will reach approx. \$800B within five years.

According to the report, most of the sector's economic activity, in line with previous years, continues to come from commercial revenues, which constitute 78% of the total space economy, reaching \$427.6B in 2022, a 8% year-on-year increase.





Credit: The Space Foundation

Nevertheless, government spending has also increased by 8%,

reaching \$118.6B in 2022. Most of the space public spending was disbursed by the U.S., and mostly motivated by an increase in military space programmes budgets. Accordingly, globally, space defence programmes now account for 45% of government spending in the space sector, when in 2021 only accounted for 41%.

Kleos Space faces bankruptcy

Kleos Space, a Luxembourg-based startup specialising in signals-intelligence satellites, encountered financial difficulties and is now facing bankruptcy. Since its inception, the company faced obstacles to get market traction with launch delays and in-orbit partial failures of its satellite. With the depletion of its cash reserves and inability to secure additional credit from its financier, Pure Asset Management, the company announced it would file for bankruptcy. Despite its financial difficulties, Kleos Space still managed to provide radio-frequency monitoring data to various clients, including government agencies, through the deployment of three clusters of satellites for detecting radio-frequency signals. Additionally, Kleos' radio signals collection and analysis technology is registered as its intellectual property.

Seraphim Space releases Q2 2023 Venture Capital index report



Credit: Seraphim Space

Seraphim Space **released its Q2 2023 Venture Capital index report** containing information on global investment trends in space companies. The report finds that \$1.2 billion has been invested over 88 deals in the second quarter of this year, in comparison with \$1.4 billion over 128 deals in the first quarter. As a result, the VC firm observed a greater concentration of capital in fewer and larger growth stage deals in Q2 2023, and it argues that it is an early signal of recovery in the growth-stage market, which saw its largest deal since Q3 2022 with Astranis \$200M venture round in April.

Regarding M&A activity, Seraphim noticed that younger companies are leading most of the acquisition over the last 12 months, instead of the traditional "old space" corporations. Moreover, PE investors have also increased their activity in the space sector.



Space Pioneer secures funding for developing its Tianlong-3 rocket

The Chinese startup Space Pioneer raised secured an undisclosed amount in a Series C for its Tianlong-3 medium-lift reusable launch vehicle. The funds will be allocated for the development of the Tianlong-3 keroseneliquid oxygen launch vehicle and its engine, as well as the construction of a dedicated launch complex at the Jiuguan national spaceport. Additionally, the funds will contribute to mass production capabilities and recruitment efforts.



Credit: Space Pioneer

The Tianlong-3 rocket is scheduled for its maiden launch in

May 2024 and designed to have comparable capabilities to SpaceX's Falcon 9. With a planned launch rate of 30 times per year from 2025, the rocket's primary goal is to support China's national communications large constellation, Guowang, which aims to rival Starlink. Looking ahead, the company has also other goals, including a triple-core version of the Tianlong-3 named Tianlong-3H, similar to SpaceX's Falcon Heavy, and a single-core rocket with a reusable spaceplane called Tianlong-3M.

HawkEye 360 secures \$58M Series D-1 round

The American space-based radio frequency data provider HawkEye 360, successfully closed a \$58M in a Series D-1 round. The company plans use the funds to develop advanced space systems and expand analytics capabilities, specifically designed to support defence missions. The Series D-1 funding round was led by funds and accounts managed by BlackRock, with participation from Manhattan Venture Partners, Insight Partners, and NightDragon.

The company currently operates 21 satellites in orbit and plans to transition to a new Block 3 satellite architecture starting with Cluster 14 and beyond. HawkEye 360 also aims to further invest in artificial intelligence, data fusion, and multi-intelligence orchestration to improve its data processing capabilities.

SpaceX reaches \$150B valuation

SpaceX reached a \$150B valuation following a secondary sale of its share made by existing investors. The sale of shares was made at a per-share price of \$81 and its part of an agreement the company holds with its employees and other company shareholders to sell up to \$750M in stock. The new valuation represents an increase of 5% in the share per price, from the previous \$77 per share, which valued the company at \$140B in December 2022.

Sylvera raises \$57M in Series B funding round



The UK-based company dedicated to developing machine **byivera** learning-based models, integrating data from satellites and other sources, to accurately predict forest carbon stocks, secured \$57M dollars. The Series B investment round saw the participation of Balderton Capital, Bain & Company,

among other VC firms. The company will use the funds to further develop its software to include different datasets and to grow its number of employees. Moreover, Sylvera will expand to the U.S. market, opening an office in New York.



Impulse Space raises \$45M in Series A funding round

The U.S.-based in-space transportation company **Impulse Space** raised \$45M in a Series A funding round, led by RTX Ventures leading the investment, with participation of the Founders Fund, Lux Capital, Airbus Ventures, and Space Capital.

The company plans to use the funds for upcoming missions, including the LEO Express-1, a GEO refuelling service, and a mission to Mars. Notably, it will facilitate the development of Helios, the company's vehicle designed to enable direct missions to Geostationary Equatorial Orbit, with no need for a Geostationary Transfer Orbit.



Credit: Impulse Space

Benchmark Space Systems secures \$33.2M in Series B funding

Benchmark Space Systems, a U.S. aerospace company specialised in developing innovative propulsion and spacecraft technologies, **raised \$33.2M in a Series B funding round**. The funding round provides Benchmark with the resources to deliver more than 220 propulsion system, meeting the increasing demand for non-toxic chemical, electric, and hybrid propulsion systems. As satellite production expands, the company will scale up its assembly and testing capabilities.

Leaf Space closes €20M Series B round plus a commitment of €15M in venture debt

The Italian-based Ground Segment-as-a-Service (GSaaS) provider for satellite operators closed a €20M Series B investment round led by CDO Venture Capital and Neva. Moreover, the European Investment Bank committed an additional €15M through venture debt. With a total raised of €35M, Leaf Space will expand its global network of ground stations from 17 to more than 50 until the end of 2024, while at the same time aiming to support new frequencies for remote sensing satellites and expand to new segments of the market. Additionally, the GSaaS provider will also increase its team by almost double until the end of the year to approx. 60 employees.

ARQUIMEA acquires Ecliptic Enterprises Corporation



Credit: ARQUIMEA

Spanish tech company ARQUIMEA completed the acquisition of Ecliptic Enterprises Corporation, an American firm specialised in optical systems, sensors, and space avionics based in California. This acquisition allows ARQUIMEA to strengthen its presence in the US market and enhance its position as a supplier in the European space sector. With the support of ARQUIMEA, Ecliptic is looking forward to further advancing its technological solutions in the space sector and

exploring new opportunities in the market. Over the years, Ecliptic has completed more than 75 missions and launched over 500 space cameras. The company also participated in major space programmes such as the Space Shuttle, the ISS, and NASA's Artemis programme. Moreover, it served notable US customers, including NASA, Boeing, Northrop Grumman, Lockheed Martin, MAXAR, and ViaSat.



Constellr raises €17M in a seed round

constellr, a German thermal remote sensing start-up, **raised €17M in a seed round** led by Karista, with the participation Einstein Industries Ventures, EIT Food, and OHB Ventures. The company will invest the capital to expedite the



Credit: constellr

deployment of its thermal imagery satellite constellation, the first of which is scheduled to be launched in 2024, and to meet its growing demand, especially in the U.S. market. The company stated that it needs four satellites to deliver daily imagery in any part of the world and plans to focus on providing accurate data for applications, particularly in the agriculture industry.

In other news

PICOSATS secures €2.13M in an investment round: The Italian satellite telecommunications company will use the funds to expand research and development efforts, enhance technology infrastructure, and grow commercial operations. Some of the participants in the investment round were LIFTT and Progress Tech Transfer.

AIRMO secures €5.2M pre-seed round to monitor greenhouse gas emissions: The investment will enable the German-based startup to launch its first satellite of a planned constellation of 12 into orbit. With the support of ESA and influential investors, AIRMO will provide near real-time data on CH4 and CO2 emissions, which will be used to tackle climate change.

Space DOTS closed \$1.5M pre-seed round: The UK-based materials testing startup will use the funds to commercialise its in-situ material testing solution Barnacle DOT. The round saw the participation of Boost VC, Sie Ventures and Angel investors such as Elaine Lau and Alex Ionescu.

AVS raised an undisclosed amount from PE firm Talde: The Spanish-based Added Value Solutions (AVS), which develops equipment for various industries, including space, plans to use the funds to develop advanced mechatronics and robvotics for the Moon, Mars and in-orbit servicing missions. This was the first investment in the space sector by Talde.

Lightridge Solutions acquires Trident Systems: The U.S.-based developer of space and airborne sensor solutions, acquired the space electronics supplier Trident Systems for an undisclosed amount. This is the company's third acquisition since 2021.

Ecometrica acquires EcoOnline: Econometrica, an end-to-end environmental software-as-aservice that helps businesses and governments to calculate their climate impact, was acquired by EcoOnline for an undisclosed amount.



LAUNCHES & SATELLITES

Global space activity statistics

July 2023	Europe	USA	China	India	Others	Total
Number of launches	1	8	6	2	1	18
Number of spacecraft launched	2	193	16	9	7	227
Mass launched (in kg)	6980	108 610	2660	4331	70	122 651

Launch activity over the year



Evolution of the number of launches per launch country







Satellite missions and markets



Evolution of the total mass launched (tons) per mission (Aug. 2022-Jul. 2023)



Evolution of the total mass launched (tons), per market (Aug. 2022-Jul. 2023)

July 2023	Telecommunication	Remote sensing	Technology/ Demonstration	Science
Europe	3572		3420	2160
USA	106 450	8	32	
China		1780	880	
India				3900
Others	5	362	82	

Total mass (kg) launched by mission and customer country

July 2023	Commercial	Governmental Civil	Military	Education
Europe	12	5568	3572	
USA	106 458	32		
China	1080	380	1200	
India		3900		
Others	35	362		52

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
01/07/2023	USA	Falcon-9 v1.2 (Block 5)	Euclid	ESA	Europe	Thales Alenia Space	France	2160	Space Science	Gov. Civil
05/07/2023	France	Ariane-5ECA+	Heinrich Hertz Satellite	DLR	Germany	OHB	Germany	3408	Tech/Demo	Gov. Civil
			Syracuse 4B	DGA	France	Thales Alenia Space	France	3572	Telecom	Military
07/07/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (56 spacecraft)	SpaceX	USA	SpaceX	USA	295 (each)	Telecom	Commercial
09/07/2023	China	CZ-2C(3)/YZ- 1S	Hulianwang Jishu Shiyan (01 & 02)	China Satellite Network Group	China	CAST	China	190 (each)	Tech/Demo	Gov. Civil
10/07/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink Mini (22 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial
12/07/2023	China	ZhuQue-2	Dummy Payload-1	Landspace	China	Landspace	China	50	Tech/Demo	Commercial
14/07/2023	India	GSLV Mk.3(2)	Chandrayaan 3	ISRO	India	ISRO	India	2148	Planetary Science	Gov. Civil
			Vikram 2 / Pragyan	ISRO	India	ISRO	India	1752	Planetary Science	Gov. Civil
16/07/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (54 spacecraft)	SpaceX	USA	SpaceX	USA	295 (each)	Telecom	Commercial
18/07/2023	New Zealand	Electron KS	Lemur-2 (169 & 170)	Spire	USA	Spire	USA	4 (each)	Earth Observation	Commercial
	Louiana		Starling (1, 2, 3 & 4)	NASA	USA	Blue Canyon Technologies	USA	8 (each)	Tech/Demo	Gov. Civil
			Telesat LEO 3	Telesat	Canada	UTIAS/SFL	Canada	30	Tech/Demo	Commercial
20/07/2023	China	Kuaizhou-1A	Tianmu-1 (4 spacecraft)	Xiyong Microelectronics	China	Xiyong Microelectronics	China	20 (each)	Meteorology	Commercial
20/07/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink Mini (15 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial
22/07/2023	China	Ceres-1 (3)	Qiankun 1	C-Space	China	C-Space	China	200	Tech/Demo	Commercial
			Xingshidai 16 / Taian	ADA Space	China	ADA Space	China	20	Earth Observation	Commercial
23/07/2023	China	CZ-2D(2)	Lingxi 03	Galaxy Space	China	Galaxy Space	China	250	Tech/Demo	Commercial
			Sixiang 01	Sixiang Technology	China	Sixiang Technology	China	160	Earth Observation	Commercial
			Sixiang (02 & 03)	Sixiang Technology	China	Galaxy Space	China	160 (each)	Earth Observation	Commercial
24/07/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink Mini (22 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial
26/07/2023	China	CZ-2D(2)	Yaogan 36-05 (A, B & C)	People's Liberation Army	China	CAST	China	400 (each)	Earth Observation	Military
28/07/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink Mini (22 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial



Launches & Satellites

29/07/2023	USA	Falcon Heavy (Block 5)	Jupiter 3 / EchoStar 24	Hughes Network Systems	USA	Maxar	USA	9200	Telecom	Commercial
30/07/2023	India	PSLV-CA(2)	ARCADE / INSPIRESAT 4	Nanyang Technological University	Singapore	Nanyang Technological University	Singapore	23	Tech/Demo	Education
			DS-SAR	DSTA	Singapore	IAI	Israel	362	Earth Observation	Gov. Civil
			Galassia 2	National University of Singapore	Singapore	National University of Singapore	Singapore	3	Tech/Demo	Education
			NuLloN	NuSpace	Singapore	NuSpace	Singapore	5	Telecom	Commercial
			ORB-12 Strider	OrbAstro	United Kingdom	OrbAstro	United Kingdom	1	Tech/Demo	Commercial
			SCOOB-II	Nanyang Technological University	Singapore	Nanyang Technological University	Singapore	3	Tech/Demo	Education
			VELOX AM	Nanyang Technological University	Singapore	Nanyang Technological University	Singapore	23	Tech/Demo	Education



Launch Highlights

The Ariane 5 era ends with a successful last launch

On July 5th, Arianespace conducted the **last launch of an Ariane 5 rocket**, from the Guyana Spaceport in Kourou. Ariane 5, whose first launch occurred in 1996, performed 117 launches during its lifetime and became the iconic launcher of Europe. The rocket had a 95.7% success rate and launched major payloads such as the Rosetta probe, the James Webb Space Telescope or, more recently, the JUICE spacecraft that will explore the Jovian system. Over time, the launcher has been improved through several versions, the one used for the last launch being an Ariane 5 ECA+.

For this launch, Ariane 5 was transporting two governmental satellites: the Heinrich-Hertz satellite (H2SAT) for the German Aerospace Center (DLR); and the Syracuse 4B spacecraft for the French Defence Procurement Agency's (DGA). The former aims at experimenting secure communications technologies for German authorities and carries a payload for the Bundeswehr, while the latter will support French military operations abroad. It will also be the last spacecraft for the Syracuse 4 constellation after the decision taken by France to give up the development of a third satellite and invest in IRIS² instead.

Europe launches a mission to study dark matter

On July 1st, SpaceX launched the European spacecraft Euclid on a Falcon 9 rocket. Euclid is a major science mission, which aims at studying in-depth dark matter and dark energy. To this end, the telescope will map the dark Universe over one third of the sky and assess its evolution. The spacecraft was launched to the Sun-Earth L2 Lagrange point, the same area as the James Webb Space Telescope. Its lifetime is expected



Credit: ESA

to be of six years. Originally, Arianespace was supposed to launch the telescope, either on an Ariane 62 or a Soyuz launcher. However, delays in Ariane 6 and the start of the war in Ukraine, which led to the withdrawal of Soyuz from Kourou, made these two options unavailable. As a result, SpaceX was contracted to perform the launch.

India launches its third Moon mission

On July 14th, ISRO used a GSLV Mk 3 rocket to launch the Indian mission Chandrayaan-3. This mission is the second attempt by India to send a lander and a rover to the Moon, after the failure of those that were onboard Chandrayaan-2 in 2019. According to ISRO, the objectives of Chandrayaan-3 are to "demonstrate safe and soft landing on lunar surface, demonstrate rover roving on the moon and conduct in-situ scientific experiments". The landing attempt is expected to take place near the lunar South Pole on 23 August 2023.

Falcon Heavy delivers the heaviest commercial satcom satellite ever launched

On July 29th, SpaceX performed the seventh launch of a Falcon Heavy to launch Jupiter 3, a GEO communications satellite for the company Hugues Network Systems, a subsidiary of EchoStar. The spacecraft, built by Maxar, is the largest commercial satellite ever sent to orbit: it weighs more than nine tons, is the size of a school bus and, when deployed, its solar arrays are as wide as a tenfloor building. The satellite will provide additional 500 Gbps to Hugues' fleet, thus doubling the capacity of the latter: the spacecraft is described as an Ultra High Density Satellite. It has been tailored to serve the needs of Hugues' customers, with a particular focus on the Americas' most rural regions.



ESPI is the European think-tank for space. The Institute is a not-for-profit organization based in Vienna, World capital of space diplomacy, providing decision-makers with an informed view on mid to long-term issues relevant to Europe's space activities since 2003.ESPI is supervised by a General Assembly of member organizations and supported by an Advisory Council of independent high-level experts. ESPI fulfils its objectives through various multi-disciplinary research activities leading to the publication of books, reports, papers, articles, executive briefs, proceedings and position papers, and to the organisation of conferences and events including the annual ESPI Autumn Conference.

Who we are		ν	Vhat we do					
Independent think- tank specialised in space policy	0	E	Research and analysis on major space policy issues					
Multinational team with interdisciplinary expertise		Q	Monitoring of global space trends and policy developments					
Part of a network of European and international partners		<u>(</u>	Organization of thematic conferences and workshops					
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