ESPI
European Space Policy Institute

ESPI Insights

Space Sector Watch

Issue 42
October 2023

THIS MONTH IN THE SPACE SECTOR...

SEVILLA SPACE SUMMIT – "ZEITENWENDE" OR A REVOLUTION POSTPONED 1

POLICY & PROGRAMMES 2

ESA aims to create European launch service providers pool 2

European Commission releases 2024 work programme 2

SpaceX's launch of Galileo satellites still lacks final approval 2

ESA and Axiom Space sign MoU for cooperation in human spaceflight 3

The Netherlands and Iceland sign the Artemis Accords 3

Roscosmos states conditions for ISS extension after 2028 and invites Brazil, Turkey and South Africa to join Russian Orbital Station 4

China plans to add new modules to Tiangong space station 4

Updates on China's lunar exploration ambitions 5

India sets new space ambitions for 2040 5

South Korea progresses with lunar mission and sign MoU with Saudi Arabia 6

U.S. Senate passes orbital debris bill 6

FCC imposes $150K fine on Dish Network for satellite deorbiting issue 6

The U.S. and Australia sign Technology Safeguards Agreement for space launch 6

European Commission selected ICEYE and Euroconsult for AEGIS^2 7

Developments in Italy in space 7

EU-Africa relations in space receive a boost through first EU-AU Space Dialogue 8

Developments in space in Germany 9

Canada allocates $1B for Earth Observation 9

Israel and Azerbaijan sign space agreement 10

India and the UAE sign MoU for space cooperation 10

U.S. Space Systems Command launches TAP Accelerator Program 10

EUMETSAT and CSA lead International Charter for Space & Major Disasters 11

In other news 11

INDUSTRY & BUSINESS 12

Updates on European launchers 12

Advancements in ArianeGroup's Susie upper stage launcher development 14

Northrop Grumman awarded $235M USSF contract for OPIR polar satellites 14

SES Space & Defense secures $900M IDIQ USSF contract for pLEO services 14

Airbus Corporate Jets partners with Eutelsat OneWeb for in-flight connectivity 15

SDA awarded contracts to Northrop Grumman and Cognitive Space 15

OHB digital services leads EUSPA-funded Copernicus demonstrators project 15

AAC Clyde Space secures €136M contract and delivers payload to OHB Sweden 16
ESA selects Thales Alenia Space and 3IPK for satellite data blockchain solution 16
Neuraspace and Arcsec partner to address space debris concerns 16
ULA launches Amazon's Project Kuiper satellite prototypes 17
Axiom Space partners with Prada for Artemis spacesuits 17
Framatome launches space initiative for nuclear-powered missions 17
Redwire Space BV secures contract with OHB Italia for ESA's Comet mission 18
TESAT and Airbus partner for Quad-MPM technology 18
ASI ALCOR programme advances INNOVATOR mission in nanosatellite sector 18
German companies collaborate on microgravity life science research 19
Telespazio Germany and Reflex Aerospace collaborate for satellite solutions 19
Djibouti Ministry and RIDE Space partner for nanosatellite mission 19
Terran Orbital secures contracts with ESA and Lockheed Martin 20
Virgin Galactic completes 'Galactic 04' mission and prepares for 'Galactic 05' 20
Seraphim Space unveils 10 space startups in accelerator programme 21
AFRL contracts Intuitive Machines, Lockheed Martin, and Westinghouse 21
SWISSto12 chooses Keysight's PTS for HummingSat geostationary satellite 22
Planetek Italia and GeosystemsME partner for Saudi green initiative monitoring 22
Eutelsat and Marlink partner for maritime connectivity in EMEA 22
NASA contracts 7 companies for Small Satellite Data Acquisition Program 22
NASA awards SpaceX to launch TRACERS mission 23
Comtech secures two U.S. Army contracts 23
Artel and Rivada secure USSF contract for U.S. government communications 23
Yahsat and G4T partner to launch connectivity services in South Sudan 24
Ispace receives award from METI and partners with Skyroot and HEX20 24
In other news 24

INVESTMENT & FINANCE 26
Seraphim Space releases Q3 2023 Venture Capital report 26
ASPACE invests $266M to establish satellite manufacturing company in Saudi Arabia 26
Qosmosys raises $100M in seed funding 26
Stoke Space raises $100M for reusable rocket development 26
Euroconsult estimates global space exploration sector funding to reach $26B in 2023 27
Skykraft secures €60M for air traffic management satellite constellation 27
Machina Labs secures $32M in Series B round funding 27
Agnikul Cosmos raises further $26.7M in funding 27
HawkEye 360 secures additional $10M in Series D-1 funding 28
Intesa Sanpaolo invest in SpaceX 28

Skyroot Aerospace raises $27.5M in pre-Series C funding round 28
Pale Blue raises $7.5M from Series B investment round 28
K2 Space secures additional $7M in funding 28
Space Pioneer secures undisclosed amount in funding round 29
MDA's UK subsidiary completes acquisition of Satixfy digital payload division 29
In other news 30

LAUNCHES & SATELLITES 31
Global space activity statistics 31
Launch activity over the year 31
Satellite missions and markets 32
Launch Log 33

LAUNCH HIGHLIGHTS 34
Vega makes launch return; successfully deploying 10 out of 12 payloads 34
Psyche asteroid mission launches on first Falcon Heavy launch for NASA 34
ULA launches prototype satellites for Amazon's upcoming Kuiper constellation 34

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SEVILLA SPACE SUMMIT – "ZEITENWENDE" OR A REVOLUTION POSTPONED

After the ESA Council Meeting on Ministerial Level in Paris, the ESPI Perspectives heading of November 2022 was **"Success within political boundaries – but widening the gap"**. A year later, similar could be said concerning the joint EU-ESA Space Summit of Sevilla. The Summit comprised an ESA inter-ministerial meeting and an informal ministerial meeting on competitiveness (space). It clearly advocated for enhancing Europe's role in space and included statements on a strong EU-ESA partnership. ESA Member States again voiced their full commitment to ESA. The Summit confirmed views regarding the European dimension of space and that space is on the agenda of all European economies and societies, within the EU and beyond.

The Summit took place at a time of increasing geopolitical crises, major security concerns, conflict and war in Europe and its neighbourhood. At a moment when time is of essence in not only monitoring but in acting and managing the impact of climate change. At a time when India just landed on the Moon. While the Summit is not a milestone for funding decisions, it is a unique opportunity for the space community, for ministers empowering their agencies and industry, to not only send a signal of bold ambition for a strong Europe in space and partner to the world, not only putting space at the service of policy objectives, but to take action in response to burning European and global challenges, at scale.

At the Space Summit 2022 in Toulouse, the French president Emmanuel Macron defined space as an expression of the strategies of political power, including the security and defence dimension and space as part of the vision we stand for in the world. Yet, when measuring the 2023 Space Summit against Europe's ambition to become an autonomous space power, next to the U.S. and China, there has been little evidence of concrete and timely action at a scale needed to avoid a continued widening of the gap between Europe and other world regions. Certainly, the new ESA partnership with the EC's DG for Climate Action constitutes an important step towards the implementation of the Accelerators, and the Space for Green Future Accelerator found wide political support in Sevilla. Certainly, the planned opening up of the launcher sector to intra-European competition, can become a game changer, and the launch of a competition to deliver commercial space cargo return services by 2028 also points in the right direction, to transform and stimulate the industrial base. It may indeed become the seed of a required "Zeitenwende" for the space industry in the future.

However, speed and scale matter and beyond statement of ambition, the funding required for a new level of ambition involved for now remains two orders of magnitude below that engaged by global competition in exploration and security. Only 2025 might bring change. One of the biggest misconceptions voiced at the Summit was that when comparing European budgets with other regions, the biggest difference would not be the public side but on the private end. With a public space budget share of GDP in the range of 0.05% in Europe compared to about 0.25% in the U.S. space in Europe fails to live up to its full potential. Despite the economic power, heritage and skills available in Europe. 85% of space budgets worldwide are public and it would be misleading to interpret the increasing private investments in space as a message that public lead, direction, finance and political will could be reduced. For Europe it is rather the opposite, as Europe's leading economy currently is unfortunately reducing its space budget.

The 2023 Summit clearly was more focused on the space ecosystem itself, e.g. did not address the security dimension and the role and power of space for prosperity, peace and future generations, in revitalizing economies and boosting the competitiveness other industrial sectors. This is also visible in the launcher discussion, which focused on the supply-side but did little to address the demand-side. How beyond European institutional missions – few when compared to launch manifestos globally – **Europe would stimulate the emergence of a European internal commercial market**, when **Cape Canaveral suffers launch congestion**.

A lot now will depend on what ESA together with its Member States will bring forward in an "ESA 2040" strategy, as a foundation of ESA CM25. The High-Level meeting planned under the Belgium presidency of the EU Council will be a critical milestone. It is hoped that this strategy will address all 3 levels of action (Policy Impact; Space Capability & Autonomy; Foundation) as advocated in **ESPI2040 vision**, and most importantly how space can become an integral part of other policy domains, including security and defence, energy, mobility, digital and green and how space can support the business strategies of entrepreneurs, Fortune500 companies and investors in pharmaceutical, automotive, food & agriculture, telecommunications. This opening up of space to the wider economy and society could ultimately constitute the "European way". It may be the way to unite Europe behind a holistic strategy, supported by strong political will.

Yours sincerely,

Hermann Ludwig Moeller

Director of ESPI

POLICY & PROGRAMMES

ESA aims to create European launch service providers pool

Credit: European spaceflight

On October 6th, ESA opened a call for European launch provider startups and companies (managed under the ESA's Boost! Initiative), which aims to support these by providing the opportunity to secure first ESA launch contracts. In particular, **ESA aims to create a pool of European launch service providers which will be used to launch in-orbit demonstration and validation (IOD/IOV) missions of the European Commission**. The call is the third call under the Boost! Initiative (Boost!3), which aims to boost the development and deployment of new European commercial space transportation services. At ESA CM22 in November 2022, ESA member states committed €31.2M for the Boost!3 call and agreed to transform launch procurement of ESA towards more open competition. The IOD/IOV initiative was launched by the European Commission in conjunction with ESA in September 2020 and aims to support academia, research institutes, and industry to test new technologies in orbit – and in accelerating and facilitating market entry. The IOD/IOV initiative aims to offer three separate services: (1) aggregation of experiments and payloads aboard a single spacecraft, (2) launch services for "ready to fly" missions, and (3) up to one year of operations for aggregated missions. The launch of the selected payloads from applications to the IOD/IOV call from spring 2022 is planned between 2024 and 2027.

European Commission releases 2024 work programme

The **European Commission released the 2024 work programme**, outlining the EU's priorities for the next year. Space is mentioned in two sections of the **document,** in "3.2. A Europe fit for the digital age" and in "3.4 a stronger Europe in the world". Section 2.3. highlights the importance of the European space industry, which is "gaining in importance for EO and modern connected products and services, **as well as for defence and security**". Moreover, it refers to the EU space strategy for security and defence, and recalls the EU's plan to propose a European space law in 2024, aiming to set rules (for ex. for STM) and how to ensure safety of European critical space infrastructure, highlighting that it will be complemented by a strategy on the space data economy to increase the use of space data across economic sectors. In Section 3.4. space features in the context of EU defence, referring to the 3rd Joint Declaration on EU-NATO cooperation, which expanded EU cooperation to new areas critical for security: resilience, emerging and disruptive technologies, defence and space. Moreover, space is mentioned in the context of the EC's efforts to strengthen the four pillars of the EU Security Union Strategy, which includes initiatives to strengthen resilience of critical infrastructure and protect the EU's space assets (incl. satellites and deter hostile activities in space). Moreover, the EU Space Strategy for Security and Defence is mentioned in the context of implementing different sectoral strategies and action plans for the EU Global Gateway Initiative.

SpaceX's launch of Galileo satellites still lacks final approval

In October, reports re-emerged that **SpaceX will launch Europe's Galileo satellites, though the deal is still pending final regulatory approval from the EU**. SpaceX has reportedly already scheduled the launch of the two missions, each carrying two Galileo satellites on board, for 2024. The issue that was long discussed and negotiated at EU level is now affected by latest updates that the Ariane 6 maiden flight is postponed until mid-2024.

ESA and Axiom Space sign MoU for cooperation in human spaceflight

Credit: ESA

On October 1st, **ESA and Axiom Space signed a MoU** to explore opportunities for cooperation in the areas of human spaceflight, space science and technology, and in commercialisation of space. The MoU enters into effect on the same day for a duration of 3 years, with options for extension.

In particular, the identified areas for cooperation include:

- Fostering science and technology development, cooperation on Axiom Space missions to the ISS and post-ISS LEO activities.
- Opening access to Axiom' commercial space station Axiom Station for Europe, encouraging ongoing human spaceflight opportunities, research, commercial business development including future European cargo and crew service providers, and more.
- Axiom Space to support ESA for institutional astronaut missions and ESA-sponsored missions for ESA Member States. The first ESA-sponsored commercial astronaut mission to the ISS is with Axiom Space on Ax 3 mission will take place in January 2024.
- European companies to support the spacesuits development (Axiom Extravehicular Mobility Unit spacesuits) and to participate in training, operation, and maintenance.
- To enhance space R&D projects on upcoming missions, leveraging European advancements in areas such as robotics, AI, health, and life sciences.

Moreover, the **UK signed an agreement with Axiom Space to pave the way for a commercially sponsored astronaut mission (valued £200M) for a two-week UK astronaut mission** (**either to the ISS or free flight in a capsule in orbit**).

The UK is the fourth European country after Hungary, Sweden, and Poland that signed different types of agreements with Axiom Space. Hungary signed a **MoU** in 2022 and a **framework agreement** in 2023 with Axiom for its Hungarian to Orbit programme to send a Hungarian astronaut to space by the end of 2024, Sweden (along with ESA) signed an **Letter of Intent** in April 2023 to send the Swedish ESA astronaut reserve Marcus Wandt to fly aboard the Ax-3 mission in January 2024, and Poland (along with ESA) signed an **agreement** for its commercially sponsored astronaut mission to carry the Polish ESA astronaut reserve Sławosz Uznański in one of the upcoming Axiom missions.

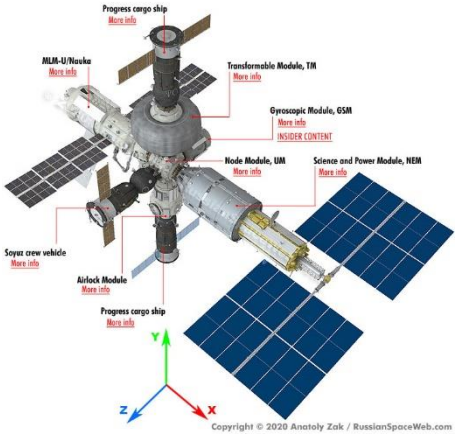
The Netherlands and Iceland sign the Artemis Accords

The Netherlands and Iceland signed the Artemis Accords, Iceland as the 30th signatory and the Netherlands as the 31st signatory. Last month, during the IAC in Baku, the Artemis Accords' signatories met to discuss the progress on two working groups – one of the two working groups investigates how to improve lunar exploration missions' transparency to avoid harmful interference, the other working group is exploring how to secure more signatories.

Roscosmos states conditions for ISS extension after 2028 and invites Brazil, Turkey and South Africa to join Russian Orbital Station

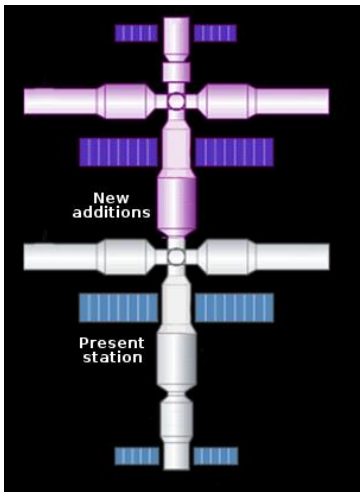
According to a statement of Roscomos Head Yury Borisov at the IAC, **Russia's extension of the operation of the International Space Station (ISS) after 2028 will depend on the technical condition of the ISS** (and in particular the Roscosmos module) and on the progress of Russia's Orbital Service Station (ROSS) and Russia ROSS cosmonaut programme. He confirmed that Russia will support the ISS partners in efforts to properly de-orbit the ISS. The other ISS partners, the U.S., Canada, Japan and Europe (ESA) extended their participation in the ISS until 2030 (end of its currently set lifetime).

Reportedly, during the IAC, **Roscosmos invited the space agencies of Brazil, Turkey and South Africa to participate in the Russian Orbital Service Station (ROSS) project**, having presented the plans for the development of ROSS and of the continuation of Roscosmos human spaceflight programme in bilateral meetings. ROSS is Russia's plan for its own LEO space station (similar to China's Tiangong space station) as a follow-up space station to the ISS.. Reportedly, **Russia aims to start the work on the first module of ROSS in 2024 and to launch it by the end of 2027**, and to launch and install nodal, gateway, baseline and 4 additional special-purpose modules between 2028-2030.



Credit: Russian.Space.Web.Com

China plans to add new modules to Tiangong space station



Credit: behind the black

China's Tiangong space station is set to expand **from three modules to six, according to Zhang Qiao of the China Academy of Space Technology**. The expansion will see a multi-functional module with six docking ports launched and docked to the core module, Tianhe. Full-size modules will then be added over the next four years. In addition to increasing the volume, Tiangong will also host a Hubble-class co-orbiting space telescope named Xuntian, which can dock with the station for maintenance, repairs, refuelling, and upgrades. Tiangong will also see the development of inflatable modules for crewed lunar exploration and further enhancements to its functionality, including 3D printers, intelligent robots, improved connectivity, and a space debris observation system.

Moreover, **China launched its Shenzhou-17 mission with three astronauts** (Tang Hongbo, Tang Shengjie and Jiang Xinlin) to Tiangong for a six-month mission aboard the Long March 2F Yaoqiu 17 rocket. Hongbo is the mission commander Astronaut, having already participated in the Shenzhou-12 mission, while both Shengjie and Xinlin flew for the first time. The mission aims to complete the on-orbit rotation with the Shenzhou-16 crew, conduct on-orbit actual (test) experiments, to continue the evaluation of the functional performance of the space station assembly and to obtain space station data. After the on-orbit rotation mission's completion, the **Shenzhou-16 astronaut crew returned** to Dongfeng Landing Site on the 31st of October.

Updates on China's lunar exploration ambitions

China unveils further details on Chang'e-8 lunar mission

At the IAC 2023 in Baku, **China unveiled details on the Chang'e-8 lunar mission and opened it for international cooperation** (mission, system or payload). Planned to launch in 2028 onboard Long March 5 from Wenchang spaceport, Chang'e-8 aims to test in-situ resource utilisation on the Moon and is planned to serve as a basis for China's International Lunar Research Station (ILRS). The mission will conduct scientific research on and investigation of the lunar local geology, analysis in-situ lunar samples and experimenting with resource utilisation, and it will include Moon-based Earth observation. CNSA's invitation for letters of intent is open until December 31st 2023 – preliminary and final selections are planned to be completed by April and September 2024.

Azerbaijan, Belarus and Pakistan join ILRS and Pakistan to send payload on Chang'e-6

During the 74th IAC, **Azerbaijan joined the China-led ILRS project**, through a joint statement signed between Azerbaijan's space agency Azercosmos and the China National Space Administration (CNSA), which foresees cooperation in the demonstration, implementation, operation and application of the ILRS, and training. Azerbaijan is the 15th signatory of the ILRS project, which aims to construct a permanent Moon base in the next decade. Also in October, **Belarus** and **Pakistan joined the ILRS project**. Pakistan and China agreed that **China's Chang'e-6 lunar mission will carry a scientific payload of Pakistan** (as one part of a broad range of international payloads, including European contributions: France's DORN radon detection instrument, ESA's negative ion detector, and Italy's laser retroreflector). The Chang'e-6 mission, planned to launch in 2024, focuses on colleting samples from the Moon's South Pole region.

Moreover, China plans to launch the Queqiao-2 (Magpie Bridge-2) relay satellite in the first half of 2024 in order to facilitate communication between the Moon's far side and Earth for data transmission and mission coordination during Chang'e6.

India sets new space ambitions for 2040

Credit: The Quotes

India's Prime Minister Narendra Modi announced new goals for India in space, including the **plan to set up an Indian space station 'Bharatiya Antariksha Station' by 2035 and the plan to take the first Indian astronaut to the Moon by 2040**, as well as the plan to launch a Venus Orbiter Mission and a Mars Lander Mission. With regard to India's human space flight programme, India's Department of Space will now work on a roadmap for Moon exploration to realise these goals and ambitions and ISRO will work on a next generation launch vehicle, a new launch pad, and human-centric laboratories and technologies, which includes a human-rated launch vehicle, a crew escape system, and space suits, for the first crewed Gaganyaan mission. On October 21st, **the first demonstration flight of the Crew Escape System Test Vehicle was conducted**, when ISRO launched an empty module from Satish Dhawan Space Center into space and brought it safely back to Earth. This successful test flight will provide the basis for the remaining qualification tests and unmanned missions – all towards the first Gaganyaan mission with Indian astronauts to the Moon in 2040. India's aims to launch at least three astronauts to LEO before the in late 2024 or 2025, Moreover, it was announced that three uncrewed missions are planned, before the final mission will fly the astronauts to space.

South Korea progresses with lunar mission and sign MoU with Saudi Arabia

South Korea's Ministry of Science announced that the **plan to launch a lander to the Moon in 2032 passed through a preliminary feasibility study and will start next year**. The $392.9M project is part of South Korea's broader plan and roadmap for a "future space economy" and to land a spacecraft on the moon in 2032 and on Mars in 2045, which President Yoon Suk Yeol unveiled last year. The spacecraft is planned to be built from 2024 until 2028 by South Korea, will be loaded on South Korea's own launch vehicle, and will be equipped with domestic equipment to detect and avoid obstacles on the lunar's surface for landing.

Moreover, following a visit of the Saudi Space Agency to South Korea, the **Saudi Space Agency and Korea Aerospace Industries (KAI) signed a MoU** to support and strengthen innovation in the aviation and space sector in Saudi Arabia, including exploring investment and opportunities in space.

U.S. Senate passes orbital debris bill

The U.S. Senate has passed by unanimous consent the Orbital Sustainability (ORBITS) Act of 2023. The bill would direct NASA to create an orbital debris remediation program. The active debris removal program would include the creation and execution of a demonstration mission to make competitive awards for R&D and technology demonstration for remediation of selected orbital debris. It is the second time the Senate has passed a version of the ORBITS Act. This is the second attempt: a similar bill passed the Senate by unanimous consent in late 2022, but was not taken up by the House.

FCC imposes $150K fine on Dish Network for satellite deorbiting issue

Credit: FCC

The Federal Communications Commission (FCC) imposed a **$150K fine on Dish Network for failing to properly deorbit a satellite**, marking the first such action in space debris enforcement. Dish's EchoStar-7 satellite was left 122 kilometres above its designated geostationary arc, halfway below its intended graveyard location. The FCC approved a plan for EchoStar-7 to be moved 300 kilometres above geostationary orbit after its mission. However, Dish encountered insufficient propellant just three months before the planned move. While the FCC did not find specific orbital debris safety concerns, the regulator stated the fine sends a clear message about its enforcement capabilities for space debris rules.

The U.S. and Australia sign Technology Safeguards Agreement for space launch

During a visit in the U.S. in October, Australian Prime Minister Anthony Albanese and U.S. President Biden agreed on new bilateral initiatives in advanced technology and space cooperation and **signed a Technology Safeguards Agreement (TSA), which provides a legal and technical framework for the launch of U.S. commercial space launch vehicles from Australia**'s territory. The TSA aims to protect sensitive U.S. launch technology and data in Australia and to create the potential for commercial opportunities in the space sector. The TSA is expected to support and boost the Australian launch sector and the several initiatives underway including Equatorial Launch spaceport, Southern Launch, and Gilmour Space. Beyond launch, the U.S. and Australia agreed to continue partnering to promote and support responsible behaviour in space.

ESA and Euroconsult partner with ICEYE for Civil Security

Credit: ESA/ICEYE

ESA selected the Finnish EO company as partner to participate in ESA's Civil Security from Space Programme (CSS), which was created after the ESA CM22 in November 2022, in the frame of the "Disaster Management from Space" project. The 3-year cooperation in the project aims to "revolutionise disaster and crisis management" by boosting the use of EO data and imagery and to develop an advanced suite of natural catastrophe monitoring services. This 3-year cooperation marks the first partnership under this new ESA programme.

European Commission selected ICEYE and Euroconsult for AEGIS²

In response to a request of the European Commission, **Euroconsult and ICEYE were selected by the EC to lead the European Earth Observation Consortium AEGIS²** ("Advanced European Governmental Innovative ISR Secured Service") Consortium, which is comprised of 15 members from 8 European countries, to conduct a 1-year feasibility study for the future of European Earth Observation. In particular, the study aims to exploring the best approach to implement EO services for governmental users at EU and its member states, investigating innovative, secure, and sustainable solutions – resulting in recommendations for the European Commission. The remaining consortium partners are Aerospacelab (BE), Cloudferro (PL), Collecte Localisation Satellite (FR), D-Orbit (IT), European Space Imaging (DE), Instituto Affari Internazionali (IT), INDRA (ES), Satconsult (FR), SITAEL (IT), Sophia Engineering (FR), Unseenlabs (FR), and 3IPK (SK).

Developments in Italy in space

Italy seeks new GEO and LEO satellites and more cooperation with U.S. industry

Under the Multiannual Programmatic Document (*Documento Programmatico Pluriennale*) 2023–2025, published on October 16th, the **Italian Ministry of Defence is seeking new GEO and LEO satellites to increase the resilience of its armed forces**. In particular, for the LEO constellation of high-performance communications and data relay satellites a €900M budget over 5 years is planned (so far only €5M approved). The LEO constellation should increase the resilience of communications networks and provide telecommunications services to the armed forces – in addition a data exchange network between government satellites will be established to support tactical missions. With regard to GEO, the MoD intends to procure a GEO telecommunications satellite "SICRAL R1" (to replace the SICRAL 1B satellite, which has reached its EoL in 2022) with a planned budget of €300M over two 3-year periods (2023–25 and 2026–28) – but needs to be approved. To fill the gap between the SICRAL satellites, €18M are envisaged for a 2-year "satcom orbital gap filler project". Last month, the **Italian MoD registered a LEO and MEO constellation** of 19,708 satellites at the ITU.

Italy aims to increase cooperation with the U.S. industry

Furthermore, **ASI President Teodoro Valente was on a mission in the U.S. to boost industry cooperation between the Italy and the U.S.** The visit included a meeting with officials from the U.S. Congress, White House, State Department, and NASA and a meeting with the U.S. companies Axiom Space, Voyager, Blue Origin, Redwire, and Rocket Lab at the U.S. Chamber of Commerce. In July, the U.S. and Italy released a joint statement, which established a "new space dialogue" to boost industrial cooperation.

EU-Africa relations in space receive a boost through first EU-AU Space Dialogue

Credit: European Commission

From October 24th to 26th, the **EU and the African Union (AU) held a first ever EU-AU Space Dialogue on cooperation in space**, which took place in Dakar, Senegal. The European delegation (led by Timo Pesonen, Director-General of the European Commission's DG DEFIS and comprised of representatives from DG DEFIS, DG INTPA, the EU's JRC, ESA and EUMETSAT) and the African delegation (composed of Amadou Ba, Prime Minister of Senegal, Maram Kaire, the Director-General of the Senegalese Space Study Agency, and representatives of the AU Commission, national space agencies of AU Member States and of regional space organisations), discussed joint initiatives and strategic partnerships in space. In particular, in the areas of space for sustainability and development cooperation, and space applications – including a dedicated event on IRIS^2 and related cooperation opportunities with African governments and industry by 2024. The space cooperation between Europe and Africa can **address global challenges such as climate change, disaster management through an effective early warning system and fishing monitoring**.

Also, during the summit, **updates on the evolution of the African Space Agency**, founded in January this year, and on various other space-related initiatives led by the AUC on the continent were presented. The structure and financing of the African Space Agency have been finalised and now the **AU plans to recruit 150 staff in three phases for the African Space Agency**. Moreover, the next steps are to create "a well-coordinated and integrated space programme" for Africa, taking into account the different degrees of African countries in the space sector, and to develop a regulatory framework that supports the African space programme.

Moreover, at the summit's sidelines, **ESA (represented by Thomas Weissenberg, ESA's External Relations Department), and the Senegalese Space Study Agency (represented by Maram Kaire, DG of the ASES, in presence of Amadou Ba, PM of Senegal) signed an agreement for cooperation to leverage space technology for socio-economic growth in Senegal**.

Credit: ASES

Also, it was announced during the summit that **Senegal is preparing the launch of its first satellite**, the EO satellite GAINDESAT, which is aimed at contributing to firefighting efforts, flood management, erosion control, and advancing agricultural development in Senegal. In partnership with RIDE! Space and Centre Spatial Universitaire de Montpellier (CSUM) the satellite will be integrated onto Momentus's Orbital Transfer Vehicle (OTV) Vigoride.

Also in October, the **EU-Nigeria Strategic Meeting** took place, with a €900M financial package as part of the EU's Global gateway Initiative and as part of EU-Nigeria cooperation to advance the country's green, resilient, digital inclusive transition. In particular, the **EU will support Nigeria** to achieve enhanced infrastructure connectivity (incl. transport, energy, and digital networks), support agriculture, economic growth, health, education, sustainable development and environmental protection.

Developments in space in Germany

On October 18th, the **BDI Weltraumkongress** took place in Berlin and brought together the German space community. The release of the new German Space Strategy and the signature of the U.S. Artemis Accords last month, as well as – in contrast – the planned budget cuts for space in 2024, provided food for discussion. During the conference, it was announced that a first launch from the North Sea offshore spaceport is planned in spring 2024.

Plans for launch from North Sea offshore spaceport in spring 2024

Following the €2M commitment of the German Government for the planned German Offshore Spaceport in the North Sea announced last month, the German Offshore Spaceport Alliance (GOSA) announced that a **first launch is planned in spring (April or May) 2024**.

Roland Berger study" Weltraumbeflügeltes Deutschland"

Roland Berger published the study "Weltraumbeflügeltes Deutschland", which analyses the importance of space for Germany's economic competitiveness, sovereignty, and sustainability goals. The **study** unveils 3 dimensions on how space-based solutions can have benefits on Earth: (1) Digitalisation of existing market models, (2) Identification and opening of new markets, and (3) Increasing resilience. Finally, the study makes recommendations for Germany's future positioning in space.

Credit: Roland Berger

Germany releases new industry strategy

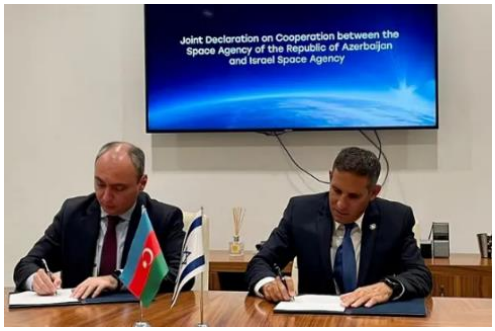
Germany released a new **industrial strategy "Industriepolitik in der Zeitenwende"** which outlines Germany's envisaged development in industry and the underlying industry policy focused on security and defence related industry areas in the light of the current geopolitical situation and the need for action ("Zeitenwende"). Space mentioned in the context of robotics and use of space data. The strategy states that the German Government will support further advancing in the field of robotics and in space. Moreover, it highlights that the "applications of space-based data and services on Earth also have great innovation potential" and that the federal government's new space strategy forms the basis for innovative and sustainable space. The **industry strategy summary** states that it is crucial to "maintain Germany as a strong industrial location in all its diversity. From global corporations to medium-sized hidden champions to small businesses. From the energy-intensive raw materials industry to mechanical and vehicle construction to space".

Canada allocates $1B for Earth Observation

The **Canadian government allocated $1B to the Canadian Space Agency to support RADARSAT+ initiative** which ensures the continuity of satellite Earth observation data provision to relevant federal authorities and organisations. In particular, the funding will be used to design and develop a replacement satellite for the RADARSAT Constellation Mission (RCM) which was launched in 2019, and to design a next-generation satellite system to succeed the RCM.

Israel and Azerbaijan sign space agreement

During the IAC, Azerbaijan, represented by Chairman of the Board of Azercosmos, Amaddin Asadov and Israel, represented by Israel Space Agency Director Uri Oron, **signed a cooperation agreement for joint projects in space**, in particular, in the development of space technologies and satellites, in space exploration systems (including robotics, vehicles, and optical systems), in Earth observation and other areas. The agreement will strengthen business, research, and academic cooperation in the space field.



Credit: Israel National News

Moreover, Israel Aerospace Industries and Azercosmos, announced a cooperation agreement for a long-term business partnership, which includes a $120M deal for Azerbaijan's acquisition of two OptSat500 reconnaissance satellites from Israel for the Azersky-2 programme, and further plans for the creation of innovation and entrepreneurship centres for space in Azerbaijan and of a joint business centre, as well as of space-related academic and study programmes in Azerbaijan.

India and the UAE sign MoU for space cooperation


Credit: INDIAai

During 11th high-level task force on investments in the UAE on October 5th, **India and the UAE signed an MoU to reinforce cooperation and further develop their industries**, through investments, technology transfer and the deployment of key technologies in industries, in space technology, AI, renewable energy, and health and life sciences. Moreover, both countries aim to strengthen the supply chain resilience of their industries through this cooperation and sharing of best practices. With regards to the envisaged cooperation in space technology, India and the UAE will cooperate in commercial launch, use of small satellites for EO, satellites communication, space exploration, in the development and licensing of space-related materials, and in joint R&D activities in space, space technologies, and space applications.

U.S. Space Systems Command launches TAP Accelerator Program

In October, the **Space Systems Command kicked-off its Space Domain Awareness Technology, Applications, and Process (TAP) Lab Accelerator Program**, which was developed to boost innovation and cooperation between industry, the DoD, and academia to boost commercial SDA prototype technologies. The projects are related to the areas: space domain awareness, threat warning and assessment, and space battle management.

EUMETSAT and CSA lead International Charter for Space & Major Disasters

EUMETSAT and the Canadian Space Agency (CSA) assumed joint leadership of the International Charter Space and Major Disasters. This global consortium, comprising 17 member agencies with support from various organizations and satellite data contributors, offers vital satellite data to aid disaster responses worldwide. EUMETSAT and CSA will serve as co-leaders for six months, managing and coordinating the Charter's operations. The Charter enables authorised disaster management authorities to trigger support from satellite agencies through a centralised system, accessible to any country. In collaboration with Sentinel Asia and the United Nations, the Charter streamlines the process of marshalling resources and expertise for rapid disaster response, sometimes delivering satellite imagery within hours.

Credit: International Charter Space & Major Disasters

In other news

ESA's Proba-3 mission completed the environmental testing campaign of the two satellites: The mission led by Sener aims to achieve a high-precision formation flight between two platforms in space. The teams will now do final preparations before the launch in 2024,

NASA extends mission of New Horizons spacecraft until 2028/2029: The New Horizons mission was originally set to end in 2024. The extension would allow the spacecraft to perform another Kuiper Belt flyby, before the spacecraft exits the Kuiper Belt in 2028/2029.

Canada provides the Philippines free access to satellites for maritime security: The satellites will enable maritime enforcers to survey vessels within the Philippines' economic zone.

China's Daocheng Solar Radio Telescope completed: Having successfully passed key testing, China's solar telescope array in the south-west is now officially completed. The telescope is part of China's space environment ground-base comprehensive monitoring network (phase-2 Meridian Project) and will provide data for space weather research and for solar physics in China.

South Africa and Tunisia strengthen bilateral cooperation: the envisaged areas of cooperation include economic cooperation, security, health, science (incl. space science) and technology.

Nigeria and China cooperate to kick-off the Crop-Watch Programme in Nigeria: the Chinese agricultural monitoring system, which uses remote sensing and ground observation data to monitor crops, aims to modernise agriculture and enhance food security in Nigeria.

INDUSTRY & BUSINESS

Updates on European launchers

Credit: Arianespace

Updates on Ariane 6

ArianeGroup is reportedly asking for a substantial annual increase in support for Ariane 6, seeking €350M. Originally, **Airbus and Safran had declared their intent to operate the future European launcher without relying on public aid**. However, their position evolved over time. In their pursuit to privatise Ariane 6, they made ambitious commitments to ESA member states, particularly France. Their initial aim to create a cost-effective launcher ready for operation by 2020 encountered setbacks, resulting in the launcher's maiden flight postponed to 2024. Currently, **Ariane 6's inaugural flight is set for April-May 2024**. A critical long-fire test is scheduled for **November 23rd**, marking the next step towards qualification.

Updates on Vega C

Furthermore, Europe's Vega C small launch vehicle faced a **delay in its return to flight until late 2024**. This delay raised from an independent investigation into an anomaly that occurred during a static-fire test in June. ESA and Avio are now tasked with conducting two static-fire tests to ensure the issue is resolved. The tests will be done in the second quarter of 2024, with a return to flight for Vega C expected in the fourth quarter of that year.

Vega launch in October

At the beginning of October, the **Vega rocket launched** from Kourou for the first time in 2023 carrying and deploying a trio of the CubeSats ANSER (Advanced Nanosatellite Systems for Earth-observation Research). These satellites will observe Iberian waters as if they were a single, standard-sized satellite. These CubeSats will carry hyperspectral imagers like CINCLUS, distributed across the three spacecraft, to detect pollution and harmful microorganisms in Earth's waters. Moreover, it carried the THEOS-2 EO satellite for Thailand and the FORMOSAR-7R/TRITON radio occultation satellite for Taiwan, and ten auxiliary payloads.

(Partially) successful test launch of MIURA-1

Lastly, on October 7th there was the **successful launch of the Spanish PLD Space suborbital rocket MIURA 1** from the El Arenosillo Experimentation Center, Spain. The suborbital flight reached an apogee of 46 km and lasted 306 seconds, demonstrating engine thrust, trajectory tracking, and launcher performance. Additionally, this mission facilitated microgravity testing for a technological device from Germany's Center for Applied Space Technology and Microgravity. The success of this launch will help toward the development of the MIURA 5 orbital launcher. The data obtained from MIURA 1 will validate up to 70% of the design and technology incorporated into MIURA 5. With MIURA 5's inaugural flight set for 2025 at the European spaceport in Kourou, PLD Space is advancing toward its goal of starting commercial operations in 2026.

Avio seeks independence for Vega launch vehicles

Credit: Avio

According to the French newspaper La Tribune, **the Italian government made an official request to remove the Vega launchers from Arianespace's portfolio**. Indeed, on October 26th, the Italian Government officially submitted a request to ESA to separate the activities of Avio from those of ArianeSpace. The division between ArianeSpace and Avio will be subject to ESA scrutiny, involving member countries of the agency, and will be addressed at the **ESA Space Summit 2023 scheduled in Seville on November 6th and 7th**.

Currently, ArianeSpace is responsible for managing the commercialisation of Avio's carriers and overseeing launches from the French Guiana. On the other hand, Avio supplies the solid rocket boosters for the Ariane 6 carrier, derived from the first stage of the Vega-C carrier. The next step will be discussed at the Space summit in November, which will provide a clearer picture of Avio's future. Updates will be presented in ESPI Insights November edition.

Avio extends contract with Telespazio for Vega launch pad support

AVIO extended its contract with Telespazio to maintain and provide operational support for the VEGA launch pad at the Guiana Space Centre. The 3-year contract, worth €2.7M, will continue until 2025. Telespazio will serve as the prime contractor, working in conjunction with its subsidiaries in France and French Guiana, which will act as subcontractors to ensure excellent service delivery. Telespazio's responsibilities include managing control and monitoring systems for the launch pad, encompassing the Vega Monitor and Control system, the automatic intervention call management system, and various mechanical infrastructure monitoring and control systems. Additionally, the company will ensure the operation of telecommunication and synchronisation systems and will provide engineering support for operational planning and the safe execution of launch operations.

UK Space Agency funds Rocket Factory Augsburg for SaxaVord spaceport


Credit: Saxavord

UK Space Agency is contributing **£3.5M to support the UK-based subsidiary of Rocket Factory Augsburg (RFA) in preparing for its inaugural launch from the SaxaVord Spaceport** in Scotland's Shetland Islands, scheduled for next year. This funding, granted also through ESA's Boost! programme, will benefit RFA UK, a subsidiary of the rocket developer tasked with building infrastructure and test equipment for the mission. RFA anticipates launching its 30-meter-tall RFA One rocket with a three-stage design in the 3 months leading up to the end of June, though this has been postponed from the year-end target. The RFA One rocket is designed to carry 450kgs to geostationary transfer orbit, with its maiden flight set to carry a research mission for Lunar Research Service based in Ukraine. Lockheed Martin also received funds from UKSA to set up launch operations at SaxaVord Spaceport, in collaboration with Californian rocket startup ABL Space Systems. ABL originally planned a SaxaVord Spaceport launch in 2023, but delays have affected the timeline. Several other European rocket developers, like Skyrora and Orbex, are exploring launch opportunities at various spaceports under development across the UK but Spaceport Cornwall in southwestern England is currently the sole site in the UK with a launch license.

Advancements in ArianeGroup's Susie upper stage launcher development

Credit: ArianeGroup

A demonstrator of ArianeGroup's reusable upper stage **Susie completed its first ignition** in Les Mureaux (Île-de-France). The 2-meter-tall, 100kg demonstrator is designed to develop a controlled landing system, with testing expected to continue until Q2 2025. The full-sized Susie spacecraft, measuring 12 meters tall and 5 meters wide with a payload capacity of 7 tonnes, is intended for a variety of roles, including crew and cargo transport. The Susie project is designed to offer an operational half-size version, which could be used to transport cargo to and from a space station. This development is in line with the requirements of the Space Summit, with plans to encourage European industry to develop space cargo transportation systems capable of servicing the ISS and future commercial stations.

Northrop Grumman awarded $235M USSF contract for OPIR polar satellites

The **USSF's Space Systems Command awarded Northrop Grumman a $235M contract** for the development of the Next Generation Overhead Persistent Infrared (Next Gen OPIR) polar satellites 1 and 2. This contract boosts the cumulative value of contracts awarded for this project to over $2.1B. The project will see Northrop Grumman creating satellites designed to track ballistic and hypersonic missiles across the Northern Hemisphere. Choosing polar orbits increases the likelihood of detecting potential missile launches and enhances early warning capabilities. The USSF chose to prioritise a constellation of smaller satellites in LEO for the Next Gen OPIR programme. This shift aims to complicate adversaries' anti-satellite targeting efforts, thereby bolstering deterrence against ballistic and hypersonic missile threats. The project is expected to be completed by July 25th, 2026.

SES Space & Defense secures $900M IDIQ USSF contract for pLEO services

Credit: SES D&S

SES Space & Defense **secured a 5-year, Indefinite Delivery Indefinite Quantity (IDIQ) contract for proliferated LEO (pLEO) satellite-based services (SBS) from the USSF**. This multi-award contract, with a total potential value of up to $900M, was awarded through the Defense Information Systems Agency's (DISA) Defense Information Technology Contracting Organization (DITCO). SES Space & Defense brings to the table enterprise management and control capabilities, enabling a seamless, integrated network of commercial satellite communications (COMSATCOM) and military satellite communications (MILSATCOM) systems. This expertise ensures DoD users access resilient, redundant, and secure multi-orbit, multi-band network solutions. These satellite services spanning multiple orbits provide the U.S. DoD with a comprehensive range of connectivity options: non-geostationary satellite orbits (NGSO), including LEO and MEO, offer low-latency and flexible, high-bandwidth connectivity, ideal for real-time applications; GEO satellites enhance global resiliency and redundancy, facilitating an array of government use cases.

Airbus Corporate Jets partners with Eutelsat OneWeb for in-flight connectivity

Credit: Eutelsat OneWeb

Airbus Corporate Jets (ACJ) joined forces with Eutelsat OneWeb **to offer an advanced in-flight connectivity solution for ACJ customers**. The collaboration leverages the capabilities of OneWeb's LEO satellite constellation and a dedicated electronic flat antenna to provide unparalleled high-speed internet access while in the air. Through this initiative, ACJ aims to ensure that both existing and future aircraft owners and passengers can experience top-tier in-flight internet, regardless of their travel destination. The partnership will enable the use of OneWeb's LEO network, characterised by low latency and higher speeds, to support a wide range of passenger productivity and entertainment applications that were previously unattainable while in-flight. The new flat antenna enhances connectivity and contributes to drag reduction. The ACJ Connect Link will be available across all Airbus Corporate Jets platforms starting in November 2024 and some operators have already expressed interest in becoming early adopters of this solution.

SDA awarded contracts to Northrop Grumman and Cognitive Space

The Space Development Agency (SDA) awarded Northrop Grumman Corporation an agreement with a potential value of around **$732M for the design and construction of 38 data transport satellites**. These satellites are intended to support the Tranche 2 Transport Layer – Alpha (T2TL-Alpha), part of the Proliferated Warfighter Space Architecture (PWSA) in LEO, aimed at enhancing military space capabilities. This award follows a previous one in August 2023, in which Northrop Grumman received a contract for 36 satellites as part of Tranche 2 Transport Layer – Beta (T2TL-Beta). The Alpha and Beta satellites are designed to work together in orbit.
The contract encompasses ground support elements and includes five years of operations and maintenance. The satellites are scheduled to begin launching in December 2026. Northrop Grumman's approach to the PWSA contracts involves combining its satellite technology, mission experience, and commercial partnerships to meet the project's demanding pace. The Proliferated Warfighter Space Architecture includes two key components: the Transport Layer, offering low-latency, high-volume data connectivity for global military missions, and the Tracking Layer, aimed at detecting, tracking, and potentially targeting hypersonic and ballistic missiles. **SDA also awarded two contracts to Cognitive Space**, a satellite automation startup, worth a combined $3.22M. The first contract, valued at $1.25M, focuses on topology and link management for dynamic satellite networks, while the second, worth $1.97M, explores routing for communications resiliency in space-based mesh networks. These contracts were awarded based on Cognitive Space's Cognitive Inference Tasking (CNTIENT) software platform, which complements SDA's Transport Layer.

OHB digital services leads EUSPA-funded Copernicus demonstrators project

OHB Digital Services, a subsidiary of OHB SE, will lead the **"Copernicus Demonstrators - Mobility, Emergency, and Infrastructures" project, with a €1.7M budget from EUSPA**. The initiative aims to harness data from the Copernicus satellite constellation efficiently. The project will demonstrate innovative proof of concepts in areas such as measuring aircraft emissions, emergency preparedness, optimising shipping routes, smart mobility, and monitoring infrastructure. It will be executed in two phases, focusing on technical feasibility and implementation. The collaboration includes partners like Euroconsult (France), e:fs TechHub (Germany), LuxSpace (Luxemburg), Waterjade (Italy), and S[&]T (The Netherlands).

AAC Clyde Space secures €136M contract and delivers payload to OHB Sweden

AAC Clyde Space secured a **€136M contract for the production of a 3U satellite set to be delivered in the fourth quarter of 2024**. This satellite will come equipped with a VDES (VHF Data Exchange System) payload, a technology developed to address the growing demand for data communication in maritime applications. VDES offers faster data transfer rates and improved data integrity compared to existing VHF data link systems.

Moreover, AAC Omnisys, a part of the AAC Clyde Space group, **successfully delivered an advanced weather sensor payload to OHB Sweden, which was subsequently integrated into the InnoSat platform**. This payload plays a crucial role in the ESA's Arctic Weather Satellite (AWS) demonstration mission. The AWS industrial team comprises 31 companies from 12 countries and the project is funded under a contract with the ESA's Earth Watch programme. The AWS mission aims to enhance global and Arctic region weather forecasting while contributing to the understanding of climate change. AAC Omnisys designed and constructed a scientific payload in Gothenburg, Sweden, specifically for this mission. The payload, a passive microwave radiometer, provides essential temperature and humidity data from various atmospheric layers, enabling improvements in numerical weather prediction and nowcasting. The satellite, weighing 120 kg and planned for launch in 2024, is the precursor to a potential constellation of satellites. These satellites could provide continuous temperature and humidity data from all parts of the Earth, ultimately enhancing weather forecasts globally.

ESA selects Thales Alenia Space and 3IPK for satellite data blockchain solution

ESA chose Thales Alenia Space and the startup 3IPK **to develop a blockchain solution as part of its FutureEO programme**. The project, set to deliver an initial solution in the first half of 2024, aims to ensure the reliability and inviolability of satellite data. It underlines the commitment to enhancing the security and integrity of important EO data. The solution, developed by 3IPK and Thales Alenia Space, will incorporate blockchain technology into the EO data processing chain. This will ensure traceability and data integrity through unique digital signatures, allowing stakeholders in the processing chain to confidently verify data provenance. Thales Alenia Space will adapt and test blockchain technology in its EO processing chains, including data from the Copernicus programme's Sentinel-2 satellites, which play an important role in monitoring land surfaces and responding to natural disasters.

Neuraspace and Arcsec partner to address space debris concerns

Neuraspace, a Portuguese startup specialising in AI-driven STM, partnered with Arcsec, a Belgian company known for its star trackers that can detect space debris. Together, **they aim to address the increasing concern of space debris and improve orbital safety**. Arcsec's star trackers, which are already used on many satellites for orientation, can identify satellites and space debris fragments. In the Neuraspace-Arcsec partnership, data collected by Arcsec's star trackers will be integrated into Neuraspace's AI-driven STM software to calculate the orbits and sizes of small debris. This will enable a more accurate assessment of collision risks in LEO.

ULA launches Amazon's Project Kuiper satellite prototypes

Credit: Amazon

On October 6th, the **United Launch Alliance (ULA) launched two prototypes of Amazon's Project Kuiper broadband satellites** from Cape Canaveral Space Force Station in Florida. These prototypes will play a crucial role in Amazon's plan to build and deploy more than 3,200 broadband satellites over the next six years. The two prototypes, KuiperSat-1 and KuiperSat-2, serve as testing tools for the space and ground systems that will be used on operational spacecraft. They will also facilitate testing of how they interact with ground terminals and the supporting ground infrastructure. Initial production satellites are slated for launch in the first half of 2024, with beta tests expected to begin by the end of that year.

Project Kuiper, Amazon's space broadband venture, aims to provide high-speed internet access to underserved and remote communities worldwide and plans to build an extensive constellation of satellites in LEO to achieve this goal. For this reason, Amazon is seeking approval from the Indian National Space Promotion and Authorization Center (In-SPACe) as it **aims to provide satellite-based broadband services in India**. Indeed, India's Space Policy 2023 encourages private and foreign participation in the space sector, fostering competition in satellite-based broadband services. This places Amazon among several tech giants, including SpaceX and OneWeb, in the growing race to provide global internet access via satellite technology.

Axiom Space partners with Prada for Artemis spacesuits

Axiom Space teamed up with the Italian luxury fashion brand Prada for NASA's lunar spacesuit design. This partnership marks the first-ever collaboration between an Italian luxury fashion house and a commercial space company. The Axiom Extravehicular Mobility Unit (AxEMU) spacesuit represents the next generation of spacesuits, equipped with advanced capabilities to enhance space exploration. The collaboration aims to enhance the comfort and functionality of spacesuits, which will be used during NASA's Artemis III mission, slated for 2025. Prada's expertise in materials, manufacturing techniques, and innovative design is expected to contribute to the spacesuit's development, addressing comfort and human factors often overlooked in legacy spacesuits. Prada will work closely with Axiom Space's team to develop solutions for materials and design features suitable for the challenging lunar environment.

Credit: Axiom Space

Framatome launches space initiative for nuclear-powered missions

Framatome, a French nuclear power company, launched Framatome Space, leveraging its 65 years of nuclear and industrial experience to benefit the space industry. The company already supplies the space sector with components like launcher domes and hafnium for spacecraft alloys. Framatome is working on a feasibility study for a nuclear-thermal propulsion engine that could significantly reduce travel time to Mars. The technology, heating liquid hydrogen in a nuclear reactor core to create high-temperature gas for thrust, promises to be two to three times more efficient than conventional chemical engines, potentially halving the time required for the journey.

Redwire Space BV secures contract with OHB Italia for ESA's Comet mission

Redwire Space BV secured a contract with OHB Italia S.p.A. **to deliver the onboard computer for the ESA's Comet Interceptor mission's Implementation Phase** (Phases C/D/E1). The ESA's Comet Interceptor mission is a venture set to become the first spacecraft to explore a long-period, dynamically new comet or interstellar object. Redwire's wholly owned subsidiary, Redwire Space NV, headquartered in Belgium, will be responsible for developing the onboard computer for the Comet Interceptor mission. This computer serves as the spacecraft's "brain", tasked with monitoring and controlling various components and transmitting crucial data to ground operators. It is an integral part of Redwire's third-generation Advanced Data and Power Management System.

Credit: Redwire

TESAT and Airbus partner for Quad-MPM technology

TESAT, a leading provider of space communication technology, entered into a contract with Airbus **to deliver its cutting-edge Quad Microwave Power Modules (Quad-MPM) for use in the OneSat telecom satellite**. This collaboration between TESAT and Airbus builds on a development programme initiated in 2020 by ESA and TESAT to enhance the functionalities and design of Microwave Power Modules (MPMs), ultimately leading to the Quad-MPM's development and qualification process. This development is made possible also with the support from ESA, CNES, UKSA, and DLR. The integration of TESAT's Quad-MPM technology into Airbus' OneSat further enhances the satellite's versatility in terms of power and frequency capabilities. The Quad-MPM is designed to support the new generation of software-defined satellites, offering high-frequency power amplification for both Ku-Band (10.7-12.75GHz) and Ka-Band (17.7-21.2GHz) satellite downlinks. This innovative module comprises four amplifier chains, allowing operators to simultaneously manage four frequency channels, enhancing the satellite's adaptability.

ASI ALCOR programme advances INNOVATOR mission in nanosatellite sector

The ALCOR programme, funded by ASI, is bolstering Italy's presence in the nanosatellite sector, fostering international collaboration, and contributing to the growth of the national supply chain, including SMEs and Research Centres. In October, **the contract for the phase A study of the INNOVATOR mission was signed** and was selected from the "Future CubeSat missions" call. ALCOR, with its fleet of CubeSats, is advancing with eleven missions in advanced planning. The mission is expected to start the phase A study officially in the coming weeks, lasting six months. The INNOVATOR mission will be executed by a Temporary Business Grouping, with DTA scarl as the agent, collaborating with Thales Alenia Space and the Interdepartmental Center for Aerospace Industrial Research at the University of Bologna. The mission's primary focus is on technology demonstrations in the fields of gravity and atmospheric science. It aims to test an innovative payload, an InterSatellite Link (ISL-T) transceiver, enabling precise radio science observations. Two 6U CubeSats will be launched to conduct high-altitude gravity and atmospheric profile measurements in LEO, experimenting with the ISL-T's performance.

Credit: ASI

German companies collaborate on microgravity life science research

Credit: Rocket Factory Augsburg

Three German NewSpace companies, Rocket Factory Augsburg (RFA), Yuri, and ATMOS Space Cargo (ATMOS), jointly announced their **end-to-end service for microgravity life science research and product development**, unveiled at the Weltraumkongress in Berlin, Germany. RFA is responsible for the entire launch service, including launch systems, infrastructure, outbound logistics, and the operational launch campaign. They will deliver ATMOS Space Cargo's Phoenix capsule, containing Yuri's ScienceTaxi, to the desired orbit affordably and flexibly. RFA will also integrate the Phoenix space capsule onto its RFA ONE launch system and provide late payload access. Launch campaigns will be conducted from the SaxaVord Spaceport in Scotland's Shetland Islands. Yuri operates the ScienceTaxi, which ATMOS Space Cargo integrates into the Phoenix capsule. With its pioneering life science incubator and bioreactor solutions, Yuri will conduct biotech research and manufacturing in space. ATMOS Space Cargo is responsible for re-entry logistics and operating the return mission of the Phoenix capsule, including safe retrieval from LEO to the Azores. The collaboration aims to boost the German NewSpace industry, making in-orbit product development more affordable. This initiative aligns with the growing demand in the life sciences sector, as the in-space manufacturing market is projected to reach €7B by 2030. The microgravity end-to-end service is slated to be available from 2025.

Telespazio Germany and Reflex Aerospace collaborate for satellite solutions


Credit: Telespazio Germany

Telespazio Germany and Reflex Aerospace formed a partnership to offer a comprehensive satellite solution. **Telespazio will provide its ground segment and mission control expertise, while Reflex will supply payload-specific spacecraft platforms**. The collaboration aims to integrate Telespazio Mission Control System with Reflex's inaugural satellite mission, enabling management of satellite and mission operations using EASE-Rise. In return, Telespazio commits to supporting Reflex in future projects as a strategic partner for ground solutions and ensuring compatibility of its mission control software with Reflex's satellites. This cooperation ensures compatibility and mutual support, streamlining operations and improving cost-efficiency. It also helps enhances their global presence, positioning both companies for success in the satellite industry while reinforcing the value of German collaboration.

Djibouti Ministry and RIDE Space partner for nanosatellite mission

RIDE Space, the Djibouti Ministry of Higher Education and Research, and the Centre Spatial Universitaire de Montpellier partnered **to work on Project Hydrosat, a mission involving Djibouti's second nanosatellite, Djibouti-1B**. This nanosatellite will be integrated into Momentus's Vigoride vehicle, preparing for its launch on a Falcon 9 rocket. Djibouti-1B will be launched in February 2024 and aims to address needs in data collection by transmitting information from meteorological stations to the Missions Control Center in Djibouti. The nanosatellite will provide climate data, closely monitor water resource changes, and assess water scarcity in Djibouti, while also observing key regions in the country.

Terran Orbital secures contracts with ESA and Lockheed Martin

Terran Orbital Corporation's subsidiary, Turin-based **Tyvak International, secured a €4.5M contract with ESA**. The contract is a collaborative effort with a consortium of Italian industries and research institutions, including the Polytechnic University of Turin, the University of Padova, and StellarProject SRL. Tyvak International will act as the prime contractor for a proximity operations and in-orbit servicing mission, which involves deploying a nanosatellite spacecraft from the Space Rider, an uncrewed European robotic laboratory. The deployed nanosatellite will conduct proximity operations manoeuvres around the Space Rider, showcasing in-orbit servicing capabilities. The Space Rider will advance research in various fields like pharmaceutics, biomedicine, biology, and physical science. Once its mission is complete, the Space Rider will return to Earth with its cargo, landing on a runway for unloading and refurbishment in preparation for future flights.

Credit: ESA

Furthermore, **Terran Orbital Corporation received an Engineering Change Proposal (ECP) from Lockheed Martin**, expanding its existing satellite design and manufacturing programme. This $7.7M contract modification follows a successful Critical Design Review earlier this year, incorporating additional scope into the project, bringing the contract's total value to over $52M. Terran Orbital's collaboration already delivered 10 satellite buses in support of Lockheed's contract with SDA for Tranche 0 Transport Layer. Presently, Terran Orbital is constructing 42 buses for Lockheed Martin's $700M contract for the SDA's Tranche 1 Transport Layer, scheduled for a late 2024 launch. Terran Orbital has also been awarded a contract to build 36 satellite buses for Lockheed Martin's $816M contract for the SDA's Tranche 2 Transport Layer (T2TL), for late 2026. The T2TL Beta constellation aims to advance the Proliferated Warfighter Space Architecture's warfighting capabilities, enhancing communication systems for global warfighter platforms and missile threat detection.

Virgin Galactic completes 'Galactic 04' mission and prepares for 'Galactic 05'

On October 6th, **Virgin Galactic successfully completed its fifth human space mission, 'Galactic 04'**. The mission was launched from New Mexico and included three new astronauts: Astronaut 017 Ron Rosano from the U.S., Astronaut 018 Trevor Beattie from the UK, and Astronaut 019 Namira Salim from Pakistan, marking her the first person from her country to venture into space. With this mission, Virgin Galactic continues to advance towards its commercial spaceflight goals, gathering valuable data for the development of future spacecraft in its Delta class. The company will initiate post-flight examinations and evaluations as part of the preparations for their upcoming commercial space mission, 'Galactic 05', **scheduled for early November**. Among the upcoming crew are suborbital researchers, Alan Stern, an associate VP of Southwest Research Institute's space science division, and Kellie Gerardi from the International Institute for Astronautical Sciences.

Credit: Virgin Galactic

Seraphim Space unveils 10 space startups in accelerator programme

Seraphim Space **announced the ten space-focused startups participating in its latest accelerator programme**, which centres on healthcare, propulsion, and addressing climate change. This three-month initiative aims to connect emerging space companies with mentors and potential investors, facilitating their quest for essential funding.

Credit: Seraphim Space

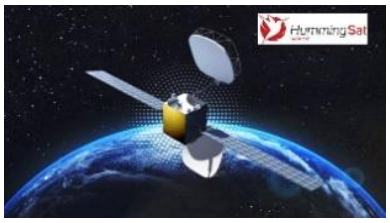
Seraphim, in partnership with its U.S. arm, Generation Space, noted that since the programme's inception in 2018, 91 startups have collectively secured over $320M in funding. An impressive 86% of these firms managed to raise capital within a year of participating in the accelerator, with an average funding amount of approximately $4M. The companies participating in the twelfth Seraphim accelerator, scheduled to conclude in November, comprises:

- Applied Atomics: A developer specializing in water-based propulsion, hailing from the UK.
- Aquascope: A freshwater intelligence provider, also based in the UK.
- BioOrbit: A UK-based firm that is creating a space-based pharmaceuticals factory.
- Optimal Cities: A provider of urban planning digital platforms, headquartered in the UK.
- Four Point: A geospatial data company with a focus on opencast mines, originating from Poland.
- SkyFi: A U.S.-based provider of EO data.
- FreeFall Aerospace: A developer of antenna technology, located in the U.S.
- Astrogate Labs: A firm from India working on a laser communication system for small satellites.
- Kumi Analytics: A Singapore-based company offering a project management platform for carbon offsetting.
- Transitry: A firm from Singapore developing an AI and blockchain platform for verifying climate impact claims.

AFRL contracts Intuitive Machines, Lockheed Martin, and Westinghouse

The Air Force Research Laboratory **awarded contracts to Intuitive Machines, Lockheed Martin, and Westinghouse Government Services as part of its JETSON programme**, designed to advance technologies for nuclear-powered space vehicles. The AFRL Space Vehicles Directorate is focusing on Joint Emergent Technology Supplying On-orbit Nuclear Power to create small power reactors for space vehicles that offer a reliable and constant source of electricity for satellites. Intuitive Machines received a $9.4M contract to design a spacecraft concept using compact radioisotope power systems and electric or hybrid propulsion. Lockheed Martin was awarded a $33.7M contract to advance the JETSON spacecraft systems and subsystems to a preliminary design review level of maturity. Westinghouse Government Services in secured a $16.9M contract to mature relevant technologies, conduct analyses, trade studies, and explore risk reduction strategies for high-power nuclear fission systems.

SWISSto12 chooses Keysight's PTS for HummingSat geostationary satellite



Credit: SWISSto12

SWISSto12 chose Keysight Technologies' Payload Test System (PTS) **to validate the RF payloads of its HummingSat geostationary satellite, Intelsat 45**. The satellite is a collaborative effort with ESA and with Viasat and Intelsat as customers. HummingSat is scheduled for launch in 2026 and will offer broadcast services for media firms and broadband connectivity for telecom providers using a Ku-band transceiver. Keysight's PTS offers SWISSto12 a set of instrumentation, signal conditioning, and measurement calibration hardware and control software for extensive and robust testing of the HummingSat RF payload.

Planetek Italia and GeosystemsME partner for Saudi green initiative monitoring

Planetek Italia secured **a contract in collaboration with Geosystems Middle East (GeosystemsME) to provide EO-based monitoring services** for afforestation initiatives in Saudi Arabia. The project, part of the Saudi Green Initiative, is aimed at planting 10 billion trees across the nation and preserving its natural resources. Planetek Italia, along with GeoSpace International and Hexagon AB, will assist GeosystemsME in developing a land monitoring platform leveraging satellite data to monitor the correct implementation of the policies outlined in the Saudi Green Initiative. The platform will calculate analytics and statistical indices, fostering data-driven decision-making processes. Through this partnership, the organisations aim to advance Saudi Arabia's commitment to environmental sustainability, addressing challenges through innovative technologies.

Eutelsat and Marlink partner for maritime connectivity in EMEA

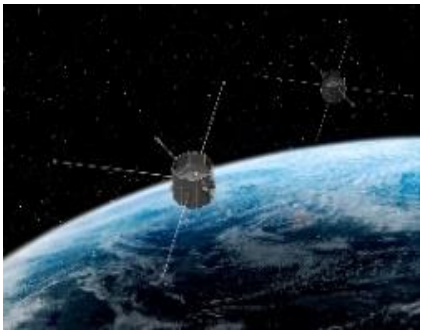
Eutelsat Communications unveiled a new multi-year collaboration with Marlink, **to provide extensive maritime connectivity solutions across Europe, the Middle East, and Africa (EMEA)**. The partnership grants Marlink access to Eutelsat's EUTELSAT 10B satellite, which has been in service since July 2023. This satellite carries two multi-spotbeam High-Throughput Satellite (HTS) Ku-band payloads. One payload covers the North Atlantic corridor, Europe, the Mediterranean basin, and the Middle East, catering to high-traffic air and sea zones. The other extends coverage across the Atlantic Ocean, Africa, and the Indian Ocean. This collaboration will bolster the maritime hybrid network's capacity and coverage, providing clients with high-quality, reliable, and secure connectivity.

NASA contracts 7 companies for Small Satellite Data Acquisition Program

NASA awarded contracts with a maximum cumulative **value of $476M over five years to seven companies**. This development expands the Commercial Smallsat Data Acquisition Program, which aims to acquire EO data and related services from commercial sources to complement NASA's own data. The chosen firms include Airbus DS Geo, Capella Space, GHGSat, Maxar, PlanetiQ, Spire Global, and Umbra. These companies will compete for contracts that will support NASA's Earth science research activities by providing higher resolution, increased temporal frequency, and other novel capabilities, predominantly through commercial satellite constellations. The contracts also include end user license agreements, allowing broad dissemination and data shareability.

NASA awards SpaceX to launch TRACERS mission

NASA awarded SpaceX a **task order to launch the Tandem Reconnection and Cusp Electrodynamics Reconnaissance Satellites (TRACERS)**, two small satellites designed to study space weather and the magnetosphere from LEO. Initially selected as a heliophysics Small Explorer mission in 2019 with a cost cap of $115M, TRACERS was intended to launch as a secondary payload with another mission. However, in August 2022, NASA decided to launch TRACERS alongside an astrophysics mission on a SpaceX Falcon 9 rocket. TRACERS will investigate magnetic reconnection between the solar wind and Earth's magnetosphere and the launch is planned for no earlier than April 2025.



Credit: Millennium Space Systems

Comtech secures two U.S. Army contracts

Credit: Comtech

Comtech Telecommunications has been awarded two contracts from the U.S. Army. The first is a **$48.6M contract to develop Enterprise Digital Intermediate Frequency Multi-Carrier (EDIM) modems**. These modems will replace the Enhanced Bandwidth Efficient Modems (EBEM) currently in use at U.S. military installations, which have been supplied by Viasat since 2014. The EDIM modems will enable digitised, hybrid satellite network architectures and will allow military network users to switch between different carriers for enhanced communication resilience. The modems are designed to support satellite communication systems across the U.S. Army and other military services. The contract was awarded under the Venture Class Acquisition of Dedicated and Rideshare (VADR) programme, and while specific quantities and delivery schedules are yet to be determined, Comtech expects a substantial demand for the replacement of EBEM modems.

The second contract has a maximum potential worth of **$544M to deliver satellite communications and professional engineering services** for the Global Field Service Representative (GFSR) programme. The programme extends communication and IT infrastructure support to multiple military branches and NATO. Comtech will provide onsite engineering services and deliver satellite and terrestrial networking communications technologies to the project manager tactical network.

Artel and Rivada secure USSF contract for U.S. government communications

Artel LLC secured a contract from the USSF for the Commercial Satellite Communications Proliferated Low-Earth Orbit (p-LEO). This agreement involves Artel collaborating with Rivada Space Networks, a partnership aimed at delivering network solutions critical for supporting U.S. Government communications. Artel has been ensuring secure government communications by harnessing first-generation LEO constellations. Now, in partnership with Rivada Space Networks, the company will extend its commitment to facilitating the latest innovations in secure space architecture, ensuring mission-critical global connectivity. The inaugural satellite launch for this initiative is set for 2025, with global service set to commence in 2026.

Yahsat and G4T partner to launch connectivity services in South Sudan

Credit: Thuraya

Al Yah Satellite Communications Company (Yahsat) partnered with South Sudanese start-up Gate for Technologies (G4T) to launch their mobility and data services in South Sudan. This collaboration involves Yahsat's subsidiary, Thuraya Telecommunications Company, and satellite broadband solutions provider, YahClick. **They will offer satellite-enabled connectivity solutions to several high-growth sectors in South Sudan**, making an advancement in the country's efforts to enhance its telecommunications infrastructure and provide e-government services. The agreement leverages G4T's market presence and existing partnerships with government entities, NGOs, mobile network operators, telemedicine providers, educational institutions, and the oil and gas sector. The partnership aims to boost the development and digital transformation of the South Sudan's telecom sector and accelerate the country's overall socio-economic growth.

Ispace receives award from METI and partners with Skyroot and HEX20

The Japanese space exploration company ispace has been awarded an **$80M grant from Japan's Ministry of Economy, Trade, and Industry (METI) as part of the Small Business Innovation Research (SBIR) project**. This grant is designed to support startup companies in conducting innovative research and development. The company will utilise the funding for the "Development and Operational Demonstration of a Lunar Lander" and is tasked with designing, manufacturing, and assembling a lunar lander capable of transporting a minimum 100 kg payload to the Moon's surface by 2027. This new lunar lander, known as the Series 3, will succeed the Series 1 lander, used in Mission 1 and planned for Mission 2, and the APEX 1.0 lander, currently under development in the U.S. The Series 3 is expected to be a versatile, large lander, capable of meeting various lunar transportation and delivery needs, responding to market demands. ispace will use its global presence, with business units in Japan, the U.S., and Luxembourg, to simultaneously develop Mission 2 (planned for 2024) and Mission 3 (planned for 2026), leveraging the grant to advance lunar exploration. Moreover, **ispace joined forces with the Indian-based Skyroot Aerospace and the Australian company HEX20** to stimulate the demand for lunar orbiting satellite missions across the Indo-Pacific region. While ispace is currently in negotiations with customers worldwide for its lunar payload and data services, the collaboration with Skyroot and HEX20 is set to expand the market for lunar orbiting satellite missions in the Indo-Pacific region. This collaboration is expected to accelerate the development and delivery of lunar satellite missions, capitalising on the complementary technologies and expertise of the three companies.

In other news

The Italian Argotec is launching U.S. operations in Largo, Maryland: they plan to invest about €25M to establish a 20,000 sq. ft. manufacturing facility. The initial project is with NASA's JPL to create a Universal Space Transponder-Lite for deep space communication.

Xage Security Gov secures a $17M contract from the USSF to develop a zero-trust security system for safeguarding space assets: the is for five years and focuses on securing ground systems, protecting next-generation space assets, and establishing zero-trust data exchange.

Relativity Space secures a multi-year, multi-launch Launch Services Agreement with Intelsat: with nine signed customers and over $1.8B in backlog, they will use the Terran R reusable launch vehicle designed for satellite launches in various orbits.

Luxembourg-based SES appointed Adel Al-Saleh as its CEO, effective February 2024: he aims to lead SES into the next phase, leveraging its strengths in customer solutions, differentiated capabilities, and financial stability. Ruy Pinto, SES's interim CEO, will lead the company until January 2024 and then serve as a strategic advisor to the CEO.

Firefly Aerospace completes its Blue Ghost lunar lander for a 2024 mission under NASA's CLPS initiative: they will deliver various payloads to the Moon's to support NASA's sustainable lunar presence goals. The company is also preparing for a second lunar mission in 2026.

Serco and Starburst are collaborating to boost innovation in the UAE's space industry: the partnership aims to assist UAE startups, facilitate international project access, accelerate business development, and provide Serco clients with the latest innovations.

The U.S. Salient Predictions secures a $2.9M grant from the Bill and Melinda Gates Foundation to assist smallholder farmers in East Africa: the funds will reinforce partnerships with local technology and weather organisations and develop sub-seasonal to seasonal weather forecasts to enhance agricultural productivity in the region.

The USSF awards a $1.45M contract to Riverside Research: they will develop a software automating data analysis of space objects, along with COMSPOC, Spire Global, and SciTec Inc. They will create an algorithm to automate manual data exploitation techniques, turning unused data into actionable intelligence.

Outpost Technologies secures a Phase 2 Ignite SBIR contract from NASA: it will advance its Cargo Ferry for returning ISS cargo. The system will aid in clearing stored ISS cargo to enable more scientific activities and will serve as a solution for future commercial space stations.

Arabsat and Microsoft Arabia partner to boost digital transformation in satellite services: they will leverage cloud technology, enhance employee digital skills, and create value-added Arab market services.

The USSF establishes Cooperative Research and Development Agreements (CRADAs) with two Indian startups, 114AI and 3rd Itech: these CRADAs represent the first for USSF with non-U.S. firms and will focus on advancing EO sensors and space domain awareness technology.

Qatar Airways partners with Starlink for free high-speed, low-latency internet on flights: Starlink will ensure connectivity on flights, enhancing Qatar Airways' 5-star in-flight experience.

INVESTMENT & FINANCE

Seraphim Space releases Q3 2023 Venture Capital report

Credit: Seraphim

Seraphim Space released their **Q3 2023 Venture Capital index report** containing information on global investment trends in space companies. The report finds that approx. $1.6B have been invested over 82 deals, representing an increase of $500M over the previous quarter, while the number of deals remained largely the same (85 deals in Q2).

Investment was predominantly driven by "Beyond Earth" business segment, accounting for 43% of the amount raised, with two top deals from Axiom Space ($350M Series C) and Sierra Space ($290M Series B extension). "Product" also attracted a significant amount of capital (25%), as investors were seeking CAPEX-light software enterprises that leverage space data. The highlight in this business segment was Mapbox, a custom online map provider, which raised $280M in a Series E.

ASPACE invests $266M to establish satellite manufacturing company in Saudi Arabia

Hong Kong-based ASPACE has **invested $266M to establish Saudi Arabia's first advanced satellite manufacturing company**. The investment will support the production of components, subsystems, and satellites in the country, capitalising on its strategic location to enhance space capabilities in the region. With strong support from the Saudi Space Agency and the Ministry of Investment, the financing is expected to attract further investments and technological advancements in the sector. ASPACE obtained an investment license during the Future Investment Initiative (FII) held in Riyadh, and support from the aforementioned national actors facilitated the completion of the first investment deal of this nature for the Saudi space sector.

Qosmosys raises $100M in seed funding

Singapore-based lunar technology company (with branches in both France and the U.S.), Qosmosys, has **secured $100M in their seed funding round**. Notably, the company did not disclose its investors as it took on **a protective funding model** in anticipation of a planned IPO by 2028 at the latest. The funding aims to accelerate the development of their lunar transportation vehicle, ZeusX, catered to various space exploration mission and in development in collaboration with Airbus, scheduled to launch in late 2027 and early 2029.

Stoke Space raises $100M for reusable rocket development


Credit: Stoke Space

Led by Industrious Ventures, **Stoke Space raised $100M in a Series B funding round** after the recent test of a prototype of the upper stage of a reusable rocket. The capital will be allocated towards the continued development of this vehicle, including the first-stage rocket engine and structure, the orbital iteration of the reusable second stage, and the restoration of Launch Complex 14 at Cape Canaveral Space Force Station, Florida. The funding also followed the American company's successful vertical take-off and vertical landing test flight of its reusable second stage in September. These capabilities demonstrated Stoke's hydrogen/oxygen engine, cooled heat shield, control system, as well as software and ground systems.

Euroconsult estimates global space exploration sector funding to reach $26B in 2023

Credit: Euroconsult

The consulting firm released its annual **"Prospects for Space Exploration" report**, where it estimates investments in space exploration to reach $26B in 2023 and grow to $33B in 2032. The main catalyst for the surge in investment is the emerging lunar race between U.S.-led Artemis program and China's International Lunar Research Station (ILRS), along with increasing private sector activity. According to the report, Moon exploration investment will reach $17B by 2032, representing a projected 5% 10-year compound annual growth rate (CAGR). The second largest contributor is human spaceflight in LEO, to peak at $7B in 2030 with the investments for the private sector to takeover LEO operations, in view of the decommissioning of the ISS in that year. Mars exploration funding is also estimated to grow, surpassing $2.5B by 2032, as well as deep space exploration, set to reach $2B by 2025, and Astronomy, Astrophysics & Heliophysics set to keep an annual funding level of $4B throughout the decade.

Skykraft secures €60M for air traffic management satellite constellation

The Australian company Skykraft completed a planned funding round, securing over **€60M to fund the deployment of its initial air traffic management constellation in 2025**. The new investors in Skykraft include Foresight Australia, OPTrust (one of Canada's largest pension funds), and Main Sequence, an Australian deep tech investment fund founded by CSIRO (Australia's national science agency). Skykraft's space-based infrastructure will consist of hundreds of satellites in LEO and offer global air traffic management with space-based VHF communications and surveillance.

Machina Labs secures $32M in Series B round funding

Machina Labs, an American company specialising in AI-based manufacturing and robotics, **secured $32M in a recently completed Series B round**, The funding was co-led by NVentures, NVIDIA'S venture capital arm, and existing investor Innovation Endeavors. With the funding, Machina Labs aims to address growing customer demand and intensify research and development. Particularly for the space domain, **the company has targeted the rocket and satellite sector**, with the aim to establish capabilities in spacefaring structures.

Agnikul Cosmos raises further $26.7M in funding


Credit: Agnikul Cosmos

Indian startup, **Agnikul Cosmos, has secured $26.7M in additional funding** ahead of its first rocket launch, bringing a total of $40M. Investors included Celesta Capital, Artha Venture Fund, and Rocketship.vc (among others). Following momentum from India's successful Moon landing, the funding will be used to prepare for commercial launches, as India seeks to increase its share of the global launch market.

HawkEye 360 secures additional $10M in Series D-1 funding

Credit: Hawkeye 360

HawkEye 360 completed its Series D-1 funding round **by securing an additional $10M, bringing the total investment for the round to $68M**. The investors in this round are Lockheed Martin Ventures, the venture arm of Lockheed Martin Corporation, and existing company insiders. This funding extension builds on the initial $58M investment announced in July 2023, led by funds managed by BlackRock. The funding will be utilised to develop new space systems and enhance analytics, focusing on high-value defence missions. As part of the investment, HawkEye 360 and Lockheed Martin entered into a strategic cooperative agreement to develop comprehensive RF intelligence solutions for government and commercial customers.

Intesa Sanpaolo invest in SpaceX

Italy's largest bank **Intesa Sanpaolo invested an undisclosed amount into SpaceX**. Reportedly part of the 31st financing round, it reflects the bank's interest in their growing space economy and aligns with their 2022-2025 Business Plan, focusing on innovation. Intesa Sanpaolo invested an undisclosed amount into SpaceX. The investment reflects the bank's interest in the growing space economy and aligns with their 2022-2025 Business Plan, focusing on innovation. This investment was reportedly part of the 31st financing round carried out by the American company. With this funding round, SpaceX aims to continue developing its Starship project, alongside the deployment of Starlink.

Skyroot Aerospace raises $27.5M in pre-Series C funding round

Skyroot Aerospace, India-based private space tech company, has raised an additional $27.5M in pre-Series C funding, led by Temasek, a Singapore-based investment company. The funds will support the company's plans for its next phase of expansion by bolstering its infrastructure, reinforcing its technological capabilities, attracting talent, and enhancing its launch frequency. This funding builds from the previous round in 2022, bringing Skyroot Aerospace's total funding to $95M.

Pale Blue raises $7.5M from Series B investment round

Pale Blue raised **$7.5M of financing through loans and a recently completed Series B funding** led by Mitsui Sumitomo Insurance Venture Capital and Incubate Fund. As a small satellite thruster developer, the Japanese company aims to establish a mass production facility for its water vapour propulsion systems to reduce costs and increase manufacturing potential. Pale Blue anticipates further investment through a second round of Series B funding later this year.

K2 Space secures additional $7M in funding

Credit: K2 Space

Los Angeles-based K2 Space has secured new venture funding, defence contracts, and is developing satellite architecture for high-power launches. **The company has raised an additional $7M in capital**, alongside the $8.5M seed round announced earlier in the year. The new investors in this round include Alpine Space Ventures, a European fund led by several early SpaceX engineers. K2 Space aims to expand its team to around 40 in the next six months in the lead up to launching the company's first satellite in 2025.

Space Pioneer secures undisclosed amount in funding round

Credit: Space

The Chinese launch company, Space Pioneer, secured **"several hundred million yuan" in a "C+ funding round"**. The funding will be used towards the development and completion of their Tianlong-3 rocket. Their two-stage rocket (with a reusable first stage comparable to SpaceX's Falcon 9) is set to launch in the first half of 2024. The investment will also be used in the production of a smaller Tianlong-2, which saw a successful inaugural flight in April 2023. The round was led by CITIC Construction Investment, the engineering and construction arm of the state-owned CITIC Group.

MDA's UK subsidiary completes acquisition of Satixfy digital payload division: With the acquisition, MDA UK will accelerate its UK market expansion and provide it with the capability to produce satellite payloads in the kingdom.

MDA's UK subsidiary completes acquisition of Satixfy digital payload division

MDA, a space technology company, has acquired Satixfy, a digital payload division in the U.K. This division will become part of MDA's existing U.K. subsidiary, MDA U.K., enhancing the company's presence in the U.K. market and strengthening its capacity to produce satellite payloads. The acquisition also fosters collaboration between the SSS team and MDA's Satellite Systems business in Montreal, enabling the advancement of MDA's digital satellite product offerings and supporting the U.K.'s leadership in the global satellite market.

In other news

Proteus Space raises $4.2M in seed funding: The satellite design and manufacturing startup plans to deploy a satellite design software platform with the opening of its manufacturing facility. Based in the U.S., the investment was led by Moonshots Capital.

SeerAI raises $4M in seed round: The technology company offering Geodesic, an AI analytics software and data fusion platform for planetary scale data, raised $4M in its seed round. Led by Synovia Capital and Vertree (part of Hartree Partners), the U.S.-based company will use the funds to accelerate processes, deliver data fusion product enhancements, and innovate further.

Arkadia Space raises $3M in seed round: Spanish-based company, Arkadia Space, raised $3M in a seed funding led by Draper B1. The company develops green propulsion systems for spacecraft and aims to use this funding to expand its facilities and workforce, as well as accelerate the development of a hypergolic bipropellant spacecraft thruster.

UNIO secures €2.5M in pre-seed funding: German-based startup UNIO secured €2.5M in pre-seed funding from investors including OHB SE and IABG. The funds develop its UNIO Bridge product, which enables a smooth transition between 5G networks and satellite connectivity.

Previsco raises £2M in funding round: Originating four years ago from Loughborough University in the U.K., flood forecaster Previsico raised £2M in a recent funding round. Led by the angel investor network, 24Haymarket, Previsico aims to expand into the U.S.

Bright Ascension secures an additional €1.7M through bridging loan: Bright Ascension, a U.K.-based space software technology provider, secured €1.7M in funding through a bridging loan. The investment will be funnelled to the development of their HELIX suite of software products.

ARCA Dynamics closes pre-seed round of €1.2M: Italian-based company ARCA Dynamics has secured €1.2M in pre-seed funding. Developed by CDP Venture Capital, the funding will allow for further tests to its solutions in orbit, continuing hardware development of its constellation, and pursuing a growth strategy in the emerging market for commercialising space traffic data.

Auriga Space secures $5M in funding round: The investor group includes Trucks VC, Seraphim Space, Possible Ventures, and others. The U.S.-based kinetic space launch startup will use these funds for prototyping and to expand its L.A. facility.

AnySingal emerges from stealth: Californian startup, AnySignal, emerged from stealth with $5M in funding. This investment was led by venture capital firm, Blueyard Capital, and the funding will be used to execute a multi-purpose space radio platform.

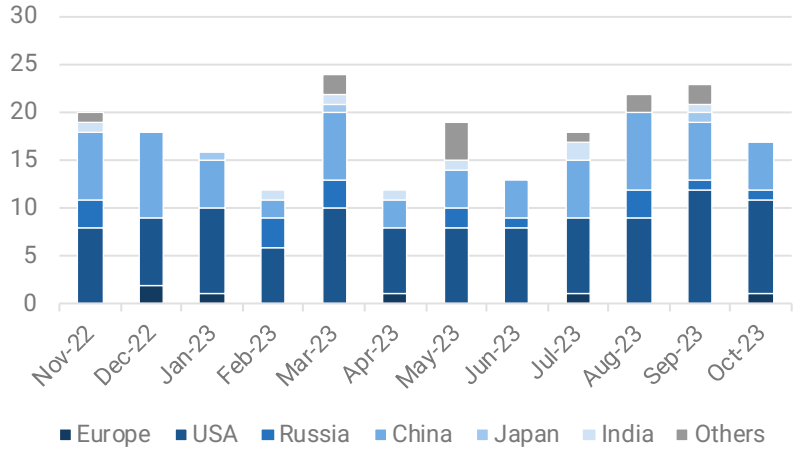
PierSight raises pre-seed round: Gujarat-based startup, PierSight, raised $600K in pre-seed round funding, with All In Capital leading the investment. The funds will advance their satellite subsystems by building their talent pool and procuring electronic components for their testing.

LAUNCHES & SATELLITES

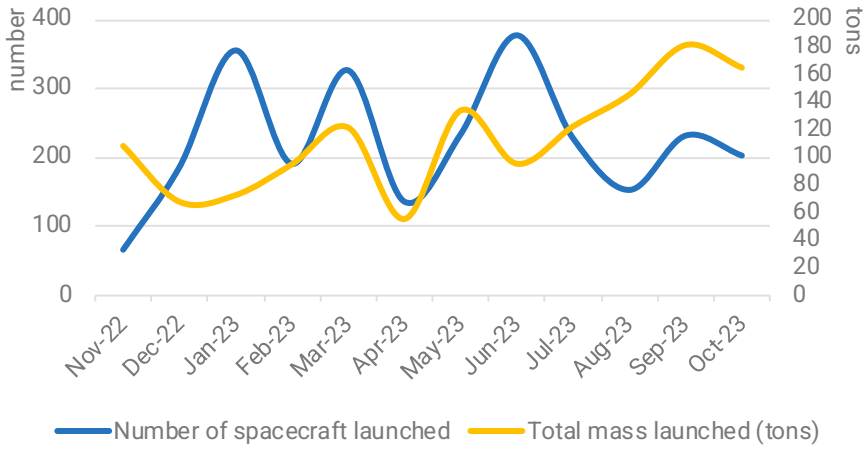
Global space activity statistics

October 2023	Europe	USA	China	Russia	Total
Number of launches	1	10	5	1	**17**
Number of spacecraft launched	12	179	9	2	**202**
Mass launched (in kg)	789.1	144 608	14 278	6000	**165 675.1**

Launch activity over the year

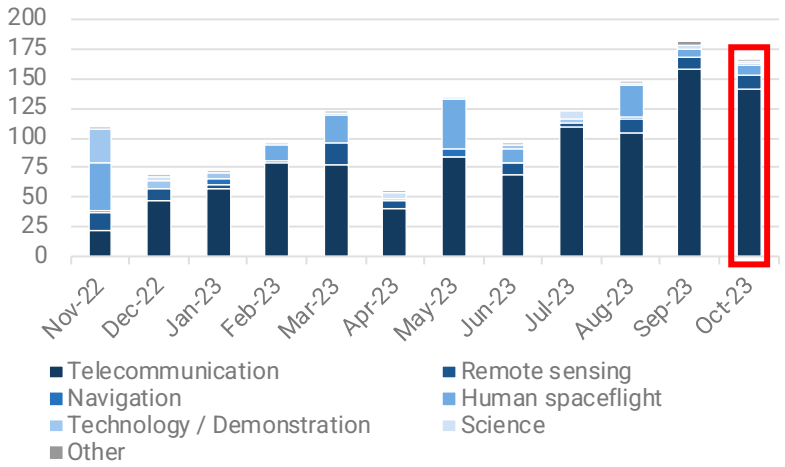


Evolution of the number of launches per launch country



Evolution of launch activity over the year 2022-2023

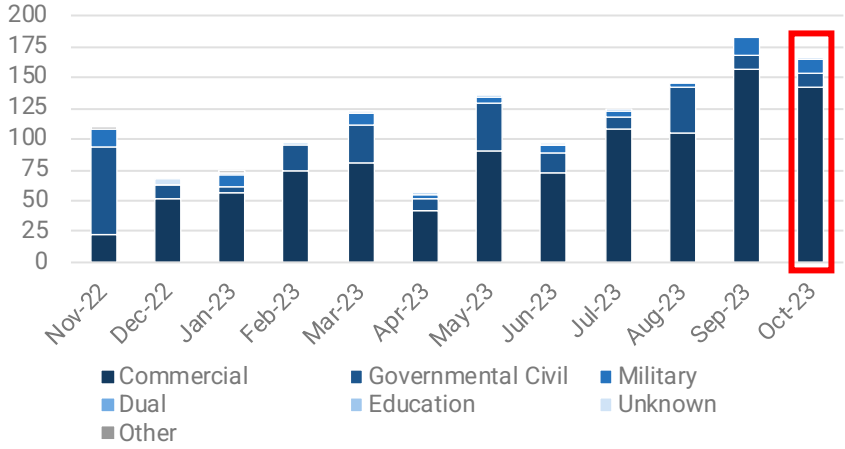
Satellite missions and markets



Evolution of the total mass launched (tons) per mission (Nov. 2022-Oct. 2023)

October 2023	Telecom	Remote sensing	Human spaceflight	Technology/ Demonstration	Science	Other
Europe	9	18		34.1		
USA	140 800			1200	2608	
China		6250	8028			
Russia		5800				200
Others		728				

Total mass (kg) launched by mission and customer country



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

October 2023	Commercial	Governmental Civil	Military	Education	Unknown
Europe	8	48.6		4.5	
USA	142 000	2608			
China		8778	5500		
Russia			5800		200
Others		728			

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
05/10/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (22 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial
05/10/2023	China	CZ-2D(2)	Yaogan 39-03 (A, B & C)	People's Liberation Army	China	DFH Satellite Co.	China	750 (each)	Signal Intelligence	Military
06/10/2023	USA	Atlas-5(501)	KuiperSat (1 & 2)	Kuiper Systems	USA	Kuiper Systems	USA	600 (each)	Tech/Demo	Commercial
09/10/2023	France	Vega	ANSER (A, B & C)	INTA	Spain	INTA	Spain	3 (each)	Telecom	Gov. Civil
			CSC (1 & 2)	ISIS	Netherlands	ESA	Europe	7 (each)	Tech/Demo	Gov. Civil
			ESTCube 02	University of Tartu	Estonia	University of Tartu	Estonia	4.5	Tech/Demo	Education
			FORMOSAT 7F / TRITON	TASA	Taiwan	TASA	Taiwan	278	Earth Observation	Gov. Civil
			MACSAT / Finch 1	NanoAvionics	Lithuania	OQ Technology	Luxembourg	8	Tech/Demo	Commercial
			N3SS	CNES	France	U-Space	France	3	Tech/Demo	Gov. Civil
			PRETTY	ESA	Europe	TU Graz	Austria	4.6	Tech/Demo	Gov. Civil
			PROBA V-CC	ESA	Europe	Aerospacelab	Belgium	18	Earth Observation	Gov. Civil
			THEOS 2	GISTDA	Thailand	Airbus	France	450	Earth Observation	Gov. Civil
09/10/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (21 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial
13/10/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (22 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial
13/10/2023	USA	Falcon Heavy (Block 5)	Discovery 14 / Psyche	NASA	USA	Maxar	USA	2608	Planetary Science	Gov. Civil
15/10/2023	China	CZ-2D(2)	Yunhai-1 04	Unknown	China	SAST	China	750	Earth Observation	Gov. Civil
18/10/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (22 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial
21/10/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (21 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial
22/10/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (23 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial
23/10/2023	China	CZ-2D(2)	Yaogan 39-04 (A, B & C)	PLA	China	DFH Satellite Co.	China	750 (each)	Signal Intelligence	Military
26/10/2023	China	CZ-2F/G	Shenzhou 17	CMSA	China	CAST	China	8028	Crew Transfer	Gov. Civil
27/10/2023	Russia	Soyuz-2-1b	Kosmos 2570 / Lotos S1 7	Russian Aerospace Forces	Russia	Progress Rocket Space Center	Russia	5800	Signal Intelligence	Military
			Kosmos 2571	Unknown	Russia	Unknown (Russia)	Russia	200	Unknown	Unknown
29/10/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (22 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial
30/10/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (23 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial
31/10/2023	China	CZ-6A	Tianhui 5	PLA	China	Unknown (China, Public)	China	1000	Earth Observation	Military

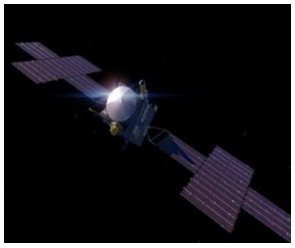
LAUNCH HIGHLIGHTS

Vega makes launch return; successfully deploying 10 out of 12 payloads

Credit: Arianespace

On October 8th, **the first Vega launch of this year took off from Europe's Spaceport in Kourou, French Guiana aiming to put 12 payloads into orbit**. This launch marked the return of the standard Vega variant, the first since November 2021, with the upgraded variant Vega-C out of business after a failure in December 2022. The primary payloads included THEOS-2, an Earth-imaging satellite by the Thai government as well as FormoSat-7R/Triton, a GNSS satellite by the Taiwan Space Agency. In addition to these, the mission carried 10 other payloads for various customers. Later this month, on October 16th, Arianespace announced that **two of the ten secondary payloads failed to be deployed**. The two cubesats are ANSER-Leader, one of three water monitoring satellites for the Spanish National Institute of Aerospace Technology (INTA), and ESTcube-2, an end-of-life satellite disposal test by the Estonian Student Satellite Foundation.

Psyche asteroid mission launches on first Falcon Heavy launch for NASA



Credit: NASA/JPL

The **Psyche spacecraft embarked on its journey to a metallic asteroid**, also called Psyche, located in the main asteroid belt following a successful launch atop a SpaceX Falcon Heavy rocket from the Kennedy Space Center on October 13th. This launch marked the eighth mission for the Falcon Heavy, but the first time NASA had been the customer. The Psyche asteroid is primarily composed of metal and is believed to potentially be the remnant core of a larger celestial body, from which the outer layers have been stripped away. The spacecraft will reach its destination in 2029 and spend 26 months in orbit around the asteroid, studying the largest solar system body made primarily of metal as part of NASA's Discovery Program. En route to its destination, the Psyche spacecraft will also carry out a technology demonstration. The Deep Space Optical Communications payload on the spacecraft will assess the viability of using lasers for high-bandwidth communications over interplanetary distances. Originally scheduled for launch in August 2022, the Psyche mission experienced delays due to issues in testing the flight software.

ULA launches prototype satellites for Amazon's upcoming Kuiper constellation

On October 6th, **United Launch Alliance (ULA) successfully launched two prototypes for Project Kuiper**, a planned broadband satellite constellation by Amazon. The launch took place from the Cape Canaveral Space Force Station, with an Atlas 5 rocket carrying the satellites. KuiperSat-1&2 serve the purpose of testing various aspects, including how the space-based systems connect with user terminals and the necessary ground infrastructure Amazon has secured launch opportunities on ULA's Atlas 5, as well as on ULA's next-generation Vulcan rocket. Additionally, Amazon has made reservations for launches on Arianespace's Ariane 6 and Blue Origin's New Glenn. However, all three launchers are facing delays and have yet to undertake their inaugural flights. To meet Federal Communication Commission (FCC) license requirements, Amazon needs to deploy at least half of its proposed 3236 satellites by July 2026, with the remaining satellites to be launched within three years after that date.

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