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THIS MONTH IN THE SPACE SECTOR...

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EO OPEN DATA IN EUROPE - INTELLECTUAL PROPERTY & SERVICES MARKET IN CHINA & THE U.S.

Europe is world-leading in space-based Earth Observation **Systems**, helping in the understanding of climate change, in the green transition, in protecting bio-diversity and commercial applications. The EU Copernicus Programme, in partnership with ESA, EUMETSAT and Member States is the world's most comprehensive satellite Earth observation programme, based on an open data policy. It provides data for services, like land management, the marine environment, the atmosphere, emergency response, security, and climate change. It is institutionally driven, with past and ongoing public investments exceeding €15B.

In recent years however, a global earth observation data & **Services** market has been developing, forecasted by Euroconsult, to reach $7.9B by 2031, with a CAGR of 6 % over the next decade. It is evident that the sustained public investment and emerging business dynamics will likely create a fertile ground worldwide for the uptake of a global market of remote sensing information services. These services are of strategic importance also in support to national security and energy transition, in rapid crisis response, extreme events and disaster management, for food security and crop productivity, and clean water. Far beyond their market impact, the **catalytic impact** of these services to reduce the costs of disasters and of climate change and to mitigate risks of geopolitical conflicts can only be measured in % of GDP. The impact of climate change on the economy in Germany alone is estimated up to €900B by 2050, according to a study of the Federal Ministry for Economic Affairs and Climate Action of Germany.

Globally, it is the private sector, which is increasingly providing the required services, relying on tailored and **proprietary software solutions**. Competitive advantage of these emerging enterprises relies on their expert knowledge in data processing and analytics, data fusion, incl. networked data of IoT/in-situ, AI, algorithms for automated feature extraction, intelligent data mining and service delivery to customers. To reap full benefit of institutional investments, the private enterprise needs to be empowered.

However, recent evidence suggests that Europe fails to develop and protect the excellence of this private sector in Europe, and to leverage its multi-billion Euro public investments in space infrastructure to also develop an equally powerful European commercial base of entrepreneurs providing critical services to governments and the market. The **2022 Patent Insight Report "Space-borne sensing and green applications"**, a study conducted by the European Patent Office and ESPI, in collaboration with ESA shows that **77% of global patent filing related to space-borne sensing and green applications are from outside Europe, with a striking presence of China** prevailing with approx. two-thirds share in the overall perspective (mostly domestic) and with the U.S. leading in international filings. About 70% of patent applications are related to processing and value-add software (rather than satellite hardware), with a growth in Chinese filings by a factor of 10 since 2011. European activity, even when considering international patent filings only, remains limited and stagnates close to 25% in the global outlook. The global industrial top players include NEC, IBM, Mitsubishi, Hitachi and for Europe Airbus and Thales. A relatively high European share is dominated by institutional actors, led by DLR, CNES and ESA - and not by newly emerging commercial enterprises and service companies. **This industrial situation risks depriving Europe from its autonomy of action to effectively implement its green policy objectives.**

Should Europe fail to develop a strong industrial base in Earth Observation, and to develop and protect its competitive advantage, in particular in value-add-processing, its industrial sector may not be sustainable and thus may become target for mergers and acquisitions driven from outside Europe, seeking vertical integration of satellites and processing capabilities. A still fragile EO industry, which represents less than 10%, when compared to the booming satellite-based connectivity market driven by the U.S. and China with LEO constellations, could become target of strong global market players in connectivity, aiming at acquiring integrated solutions combining remote sensing with connectivity and other space-based services.

The **Chinese National Patent Development Strategy of 2011-2020** established strategic measures to incentivise the protection of intellectual property for high and new-technology enterprise, including space. As part of a general strategy in response to the above, also Europe will need to develop new approaches to protect intellectual property, which not only protects the public owner of space systems, like Copernicus. It needs to encourage and allow entrepreneurs to protect their know-how and business case, to develop economically sustainable Earth observation solutions as basis for private investment and growth. This is increasingly critical, considering the open-data policy in the economy at large and the digitalisation of the space sector.

Yours sincerely,

Hermann Ludwig Moeller
Director of ESPI

POLICY & PROGRAMMES

NATO members launch APSS initiative with the "Aquila" virtual constellation enhancing the use of space

Credit: NATO

16 NATO members, including Belgium, Bulgaria, Canada, France, Greece, Hungary, Italy, Luxembourg, Netherlands, Norway, Poland, Romania, Spain, Turkey, the UK and the U.S., together with the aspiring members Finland and Sweden, **launched a new initiative the "Alliance Persistent Surveillance from Space" (APSS)**, which aims to transform the approach how NATO receives and uses space data, to improve NATO's surveillance and intelligence as well as to support military operations. This multi-year initiative of civil-military cooperation will include the creation of the virtual constellation "Aquila" of national and commercial space assets. The initiative aims to generate cost savings and support streamlining collection, sharing and analysis of data among allies and the NATO command structure. The **APSS initiative aims to**:

- achieve 'persistent surveillance' - enabling NATO to collect data on any location at any time.
- increase sharing of space-based intelligence among NATO allies - for more comprehensive cross-domain intelligence to inform political-decision making and military operations.
- improve NATO's intelligence - through a more effective use of government-owned and commercial space-based assets, technologies and data.
- increase the speed at which space-based data is collected and delivered – through new technologies, such as AI and ML.
- ensure the usability of data for NATO decision-makers and military commanders.
- build a community of practice among NATO nations for better data management efficiency and enhance national and collective resilience - through training, education and cooperation.

The initiative is strongly backed by Luxembourg with the groundwork enabled through its early 16.5M contribution. The participating countries contribute to Aquila through national assets, data, and funds, while the initiative will also remain open to other allies. In addition to national contributions, industry will support APSS through the provision of data and services.

Moreover, the signing ceremony for **Operational MoU of the NATO Space Centre of Excellence (joint effort led by 15 sponsoring nations) took place at the French MoD in Paris**. The Centre aims to provide knowledge and analysis covering the 3 operational functions (1) Space Domain Awareness, (2) Operational Space Support, and (3) Space Domain Coordination, and will bridge between NATO and national and international space organisations from defence, civil, industry, academia, and research sectors.

European Parliament voted for IRIS²

The European Parliament **adopted the report on the proposal for a regulation of the EP and of the Council of EU establishing the EU Secure Connectivity Programme IRIS²** with a majority of 603 votes in favor (6 against and 39 abstentions), Now, the Council of EU will scan the text for formal adoption before its signature and publication. The Council of EU's adoption will path the way for manufacturers to submit bids by from March to build, launch, and deploy the IRIS² multi-orbit network by 2027, while initial services are planned to start in 2025.

EO Space sector supports Turkey and Syria relief efforts with satellite images

Credit: ESA

EO satellites have gained strategic importance in security crises, such as the ongoing war in Ukraine, as well as during natural disasters. The recent earthquake that occurred in southeastern Turkey and Syria highlighted the usefulness of satellite imagery for disaster management, including search and rescue operations as well as recovery and to understand the damage extend.

Turkish authorities, the UN and the International Federation Red Cross & Red Crescent Societies activated the **International Charter "Space and Major Disasters".** The Charter provides satellite images, by combining EO data and images from various space agencies, of the affected regions to illustrate the extent of the disaster and to support local rescue teams with search and rescue efforts. Moreover, the charter activated the Copernicus Emergency Mapping Service (CEMS). The result was the delivery of 350 images from 17 space agencies including, **ESA**. **NASA**, **ASI**, **DLR**.

ESA signs Cooperation Agreement with Mexico

On February 14th, during a visit of the ESA delegation in Mexico, ESA and the Mexican space agency (AEM), represented by Salvador Landeros, DG of AEM, Rogelio Jimenez, Mexican Sub Secretary of Infrastructure, Communications and Transportation, and Eric Morel de Westgaver, ESA Director of European, Legal and International Matters, **signed a Cooperation Agreement**. The objective of the agreement is enabling the creation of a framework for enhanced cooperation in joint projects, particularly in education, Earth observation, and integrated applications.

Credit: AEM

European space debris removal ClearSpace-1 mission passes programme review

ESA recently conducted a major programme review of the ClearSpace-1 mission, which was successfully passed by the Swiss ClearSpace and its industrial partners. ClearSpace-1 is an active debris removal (ADR) mission that uses an innovative four-armed capture system for the robotic satellite to remove large debris objects. The review confirmed the mission's ability to meet the required technology specifications. At the ESA CM22 in November 2022, Member States reconfirmed their support for the ADR mission by providing full funding for its next phase. The next milestone will entail the delivery of a detailed design of the spacecraft as well as procurement of satellite equipment, and manufacturing. Launch is expected to take place in 2026.

South Korea picks Vega C for KOMPSAT-6 launch, Vega C returns to flight by end of 2023

In February. **South Korea selected Arianespace's Vega C rocket to launch its EO (SAR) satellite KOMPSAT-6**, following a competitive process of international bidding. In December, South Korea formally revoked a Russian contract for the launch of KOMPSAT-6 from the Plesetsk Cosmodrome aboard an Angara rocket initially planned for the end of 2022.

Meanwhile, the **independent inquiry commission investigating the December Vega C launch failure, identified the cause of the failure**: a flaw in the carbon-carbon material utilised for the throat insert of the Zefiro 40 second stage nozzle. The Zefiro 40's nozzle material will need to be replaced with another carbon-carbon material. Following this result of the investigation, Vega C is expected return to fly again by the end of this year.

UKSA announces £50M for UK companies to develop communication and navigation services around the Moon and £6.5M to boost the UK space sector


Credit: ESA

The **UK Space Agency announced £50M funding as part of ESA's Moonlight Programme, for UK companies to develop communication and navigation services** for the Moonlight satellite constellation around the Moon from 2028. This funding comes on top the UK-led Lunar Pathfinder project expected to launch by 2025, with the UK is prepared to support the preparation of the next stage of Moonlight.

Moreover, **UKSA will allocate £6.5M to 18 new space projects to boost the UK space sector**, which includes support for the development of a network of locally-led space clusters and Cluster Development Managers, £1.5M for a business support providers consortium led by Entrepreneurial Spark to support space entrepreneurship, and £485,000 for the national SST sensor STFC RAL Space's Chilbolton Advanced Satellite Tracking Radar. The projects are divided in 3 categories:

- **Locally led, high impact projects:** (1) Space Technology and Exploitation Programme (£495.000); (2) GreenSpace (£483.000); (3) Pivot into Space (£500.000); (4) SpaceCraft (£406.000); (5) Developing a Sustainable Scottish Space Sector (£373.000).
- **Scoping Projects:** (1) Dark Sky Observatory (£36.000); (2) Space for Good: Water Management with EO Data (£20.000); (3) R2-D2: Resilience to Recovery – Data for Disasters (£20.000); (4) Monitoring of Natural Assets (£18.000).
- **Cluster Development Managers:** Northern Ireland Space Office (£223.000); North-East Centre Of Excellence (£296.000); Space Hub Yorkshire (£348.000); West of England Combined Authority and National Composites Centre (£136.000); Cornwall Space Cluster (£272.000); New Anglia LEP (£163.000); Aerospace Wales (£200.000); University of Leicester (£284.000); Space South Central (£300.000).

India and Egypt initiate strategic partnership to expand space cooperation


Credit: Dollar Business

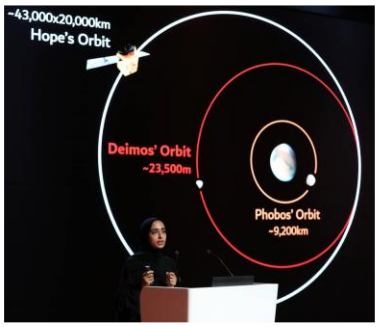
India and Egypt strengthened their relations and cooperation (among other areas) in space, by **initiating a strategic partnership**, which is based on four pillars: (1) Political and security cooperation; (2) Economic engagement; (3) Scientific and academic collaboration; and (4) Cultural and people-to-people contacts. With regards to space, the two nations agreed to expand cooperation in the fields of research, space science, satellite communications as well as applications of space technology to tackle societal challenges.

U.S. and India expand civil space cooperation

During meetings in Washington, **the U.S. and India agreed to expand civil space cooperation**. The agreement includes training Indian astronauts at NASA's Johnson Space Center and flying payloads as part of NASA's Commercial Lunar Payload Services (CLPS) program. As part of this programme, NASA is purchasing flights for payloads on commercial lunar landers currently under development.

In 2024 NASA and ISRO will convene a meeting of U.S. CLPS providers with Indian aerospace companies. Moreover, a new initiative between the U.S Department of Commerce and India's Department of Space was announced, which aims to strengthen "commercial space engagement" and to enable partnerships between the commercial space sectors of both countries.

UAE adopts National Space Fund



Credit: The National

On February 6th, during the UAE's Cabinet meeting, the **resolution for the establishment of the UAE National Space Fund was adopted**. The UAE Space Agency will manage and supervise the fund, which aims to develop national capabilities and infrastructure supporting the space industry. The fund is part of a drive to diversify the national economy and strengthens the position of the UAE in the space sector. Moreover, the fund aims at adopting governance systems to achieve leadership in the space sector, attracting specialised global companies, and building partnerships between domestic and foreign advanced technology companies.

Moreover, on February 9th, it was announced that the **UAE's (and the Arab world's first) interplanetary probe Hope has moved to a new orbit around Mars to study Deimos**, one of Mars' tiny moons. The announcement was made at the second anniversary of the spacecraft reaching Mars.

UAE Space Agency and Roscosmos discuss fields of cooperation

Also in February, a delegation of the **Russian State Space Corporation Roscosmos led by DG Yury Borisov visited the UAE Space Agency to discuss fields of collaboration and topics of shared interest**. These reportedly included the peaceful utilisation of outer space, the 28th session of the UN Framework Convention on Climate Change (COP28) hosted by the UAE, as well as the crucial role of the space sector in supporting global initiatives to address climate change studies.

NASA and Israel Space Agency cooperate on Beresheet 2 lunar mission

On February 1st, the Israel Space Agency (ISA) and NASA, represented by NASA Associate Administrator Robert D. Cabana and ISA Director-General Uri Oron, **signed a Statement on Intent for their cooperation in and NASA's contribution to Israel's Beresheet 2 lunar mission,** planned to launch in 2025. Beresheet 2, the second lunar mission led by SpaceIL, will comprise of a three-spacecraft system. One of the two small lunar landers will land on the far side of the Moon, and the other lander on the near side, while the orbiter will orbit the Moon for more than 5 years and serve as an educational science activities platform via a remote connection. Already in 2019, ISA and NASA cooperated on the first Beresheet mission. The Beresheet 2 landers will land on the dark side of the Moon and will carry NASA's scientific instruments, which will carry out radiation measurements.


Credit: SpaceIL

Moreover, **SpaceIL signed a cooperation agreement with the German Aerospace Center (DLR) on Beresheet 2**, which includes the use of DLR's unique Crater Navigation algorithm (CNav). The algorithm is able to identify craters in lunar surface images and adds the data to an onboard database which will support navigation during the landing with accurate positioning information.

Furthermore, **NASA will launch Israel's first space telescope mission "Ultraviolet Transient Astronomy Satellite" (ULTRASAT)**, a GEO-based ultraviolet observatory to investigate short-duration events in the universe, in early 2026.

NASA changes landing sites for lunar missions

Credit: Astrobotic

In February, **NASA and Astrobotic changed the landing site for Astrobotic's first lunar lander mission "Peregrine"**, which will fly payloads, among others, for NASA's Commercial Lunar Payload Services (CLPS) program.

The landing site was moved from the initially targeted region "Lacus Mortis" at the north-eastern side of the near side of the moon to a scientifically more interesting region called "Gruithuisen Domes" on the western part of the Moon's near side. There is no update on the anticipated launch date of Peregrine on the inaugural flight of ULA's Vulcan Centaur rocket.

Moreover, citing scientific interests, NASA requested Intuitive Machines LLC, to **shift the landing site of the company's first mission with the Nova-C lunar lander to the lunar South Pole region**. The Nova-C lunar lander would become the first spacecraft to perform a soft landing on the Moon's South Pole Region. Currently, the landing date is planned end of June.

Russia plans to launch first uncrewed lunar space mission in July

Russia plans to launch its first uncrewed lunar space mission on July 13th. The mission aims to conduct research near the Moon's south pole. Initially, the mission with the Luna-25 spacecraft was planned to launch last year but was postponed due to technical issues. The mission's objective and purpose is to send a robotic probe to conduct research near the Moon's south pole.

Iran unveils two national satellites and announces to assist allies in space tech

During a ceremony in Tehran on the occasion of Iran's National Day of Space, **Iran unveiled two national satellites "Nahid-2" telecommunication satellite and "Tolou-3" a remote sensing satellite**. Reportedly, Nahid-2 was built by the Iranian Space Research Center, while Tolou-3 was produced by Iran Electronics Industries – both at the request of the Iranian Space Agency (ISA) and currently prepared for launch. Moreover the head of the Iranian Space Agency Hassan Salarieh announced that Iran reached a new stage in the industrial field of space technology and that **Iran is "ready to help neighbouring countries in this field".**

Credit: Tasnim News Agency

China plans to build new satellite ground stations with 4 antennas in Antarctica

On February 2nd, China Space News reported that **China aims to construct new ground station facilities (an ocean observation satellite ground system, incl. 4 radome-covered antennas) complementing its Zhongshan research base in East Antarctica**. The facilities will support satellite data acquisition in polar and near-polar orbits. China Aerospace Science and Industry Corporation (CASIC) won a contract to develop the ground system. This $6.52M project, which is part of a broader marine economic development plan, will be supervised and by the Chinese National Satellite Ocean Application Service (NSOAS).

ESA and China conduct spacecraft-rocket integration tests for SMILE mission

Credit: CAS

In February, **ESA and Chinese scientists jointly conducted spacecraft-rocket integration tests (incl. docking, satellite separation and impact tests) at ESA's ESTEC** with a prototype of the satellite for the ESA-CAS Solar wind-Magnetosphere-Ionosphere Link Explorer (SMILE) science mission.

The 3-year mission, which is planned to launch in 2025 (after being postponed due to project delays), has the objective to study solar wind and Earth's magnetosphere interaction and effects in the ionosphere. The prototype SMILE satellite was developed by the Innovation Academy for Microsatellites of the CAS (IAMCAS), while ESA developed the payload adapter for the mission's launcher Vega-C. This joint testing marked the first time that a Chinese team has conducted such tests at ESA facilities.

Esri and NASA sign Space Act Agreement

Esri, a California-based company specialised in GIS software, mapping and location intelligence, **signed a Space Act Agreement with NASA**, which focuses on extending the access of NASA's geospatial data and images for research and exploration to the global GIS user community.

In particular, the partnership will support **NASA's existing data in ArcGIS Living Atlas of the World**, the collection of geographic information and services (incl. maps and apps), so that NASA's data will be increasingly available 10 million GIS users.

In other news

EUSPA signs agreement with Czech government for new HQ in Nová Palmovka in 2025: Due to the growth in Prague, EUSPA needs to be relocated to new premises. The new facility in Nová Palmovka provides more security and space and the use of a data centre.

NASA selects Joe Acaba as Chief Astronaut at NASA's Johnson Space Center in Houston: Acaba will replace NASA astronaut Drew Feustel. As Chief Astronaut, Acaba will coordinate astronaut resources and operations, support the development of concepts for astronaut flight crew operation, and assign the crews for future human spaceflight missions, incl. Artemis.

Hungary and Azerbaijan sign joint declaration on enhanced strategic partnership: the declaration is comprising 6 documents, including 5 MoUs on further enhancing cooperation in the fields of energy, culture and tourism, food security, migration and space.

UNOOSA and Avio select consortium of the Universities of Nairobi, Arizona (UA) and Space Trust for launch with Vega C: The consortium is the first awardee of the "Accessing space with Vega C" program and will launch CubeSat NaSPUoN-0GPM2030 at no cost on Vega C.

NASA conducts cybersecurity review of Deep Space Network (DSN) tracking site: This public website was taken offline for NASA's cybersecurity review linked to future Artemis missions, because the use of the DSN by Artemis 1 affected other major network users, such as the JWST.

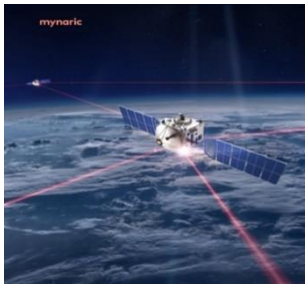
INDUSTRY & INNOVATION

Axiom Space returns to the ISS with Axiom Mission 2

Credit: Axiom Space

Following the late January **approval of Axiom Space's second private crewed mission to the ISS**, Axiom Mission 2 (Ax-2), the American-based company will fly four astronauts atop a SpaceX's Falcon 9 in spring. The 12-day mission will be carried out by a multinational crew, including two Saudi astronauts and the **first Saudi woman to embark on the ISS, Rayyanah Barnawi**. The Ax-2 crew will partake in extensive scientific research on the mission and investigate cutting-edge technologies with a view to lay the groundwork for the world's first commercial space station under development by Axiom Space.

Mynaric expands foreign customers audience



Credit: Mynaric

On February 8th, the German laser communications producer **Mynaric announced the delivery of multiple CONDOR Mk2 optical communications terminals** to Telesat's subsidiary Telesat Government Solutions (GS). The terminals form part of the Blackjack Track B Programme led by the U.S. Space Force and DARPA, onboard Telesat-manufactured Croupier satellites. The project aims to demonstrate the high military utility of commercial communication LEO technologies for the U.S. Department of Defence. Mynaric's terminals will establish links for intra-plane and cross-plane operation scenarios in various orbits and Space-Space, Space-Air, and Space-Ground communication. In addition, **Mynaric signed a $24M contract with the Japanese WARPSPACE** to establish a commercial optical communication data relay for EO satellites.

5G IoT solutions provider Sateliot enters new & growing markets

Internet of Things (IoT) is bringing remarkable progresses to the energy industry, with improvements in cost-effectiveness, analysis of large data sets, sustainability, and the development of new applications.

The **Spanish IoT start-up Sateliot and the Argentine Sentrisense** concluded an agreement to improve high voltage lines' sensors connection in remote areas. Sentrisense will leverage Sateliot's 5G NB-IoT nanosatellite constellation to monitor electric grid sensors attached to power lines to manage broken electric grids more efficiently. The network is capable of pinpointing damaged wire locations within five minutes, contrary to the average reaction time of four hours.

Credit: Sateliot

Sateliot also announced a **strategic partnership with the Slovak GOSPACE LABS** to provide 5G IoT satellite connectivity solutions to U.S. citizens. Specifically, the two companies will upgrade GOSPACE LABS's water management MERATCH smart solutions to enhance the U.S. capability to monitor the presence of contaminants in water.

ESA awards several R&D contracts in robotics, chips and propulsion

Credit: ESA

The Lithuanian-based **Blackswan Space revealed it was awarded three new contracts from ESA** to implement state-of-the-art robotics algorithms and create real-time 3D simulations of the GNC Rendezvous, Approach, and Landing Simulator (GRALS) facility of the European Space research and Technology Centre (ESTEC). In addition, the company will support in the development of a 3D model of a geostationary satellite to accomplish rendezvous and docking attempts.

Moreover, the UK semiconductor manufacturer **EnSilica was awarded a €5M contract through ESA** Advanced Research in Telecommunications Systems Core Competitiveness Programme (ARTES CC) with the support of the UK Space Agency for the development of next generation satellite communications chips. The cutting-edge technology will enable lower-cost, low-power satellite broadband user terminals, and high bandwidth connectivity.

Furthermore, the Norwegian Clara Venture Labs, along with Added Value Solution (AVS) and the Center of Research and Technology Hellas (CERTH), will be collaborating on a **project with ESA to supply a Solid Oxide Fuel Cell (SOFC) system** for a spacecraft that aims to land on one of the moons orbiting Jupiter or Saturn. The SOFC system will serve as an alternative energy source to solar panels and will use methane and oxygen as they can store fuel for longer durations in storage tanks. Additionally, the SOFC system will provide electric power and heat to keep the critical systems of the landing probe in a suitable temperature range.

Tyvak Nano-Satellite Systems wins $2.4B contract from Rivada Space

Terran Orbital Corporation's subsidiary, Tyvak Nano-Satellite Systems, has won a **$2.4B contract to design, build, and deploy 288 LEO satellites for Rivada Space Networks**, with 12 spare satellites also to be developed. The deployment of these satellites will enable Rivada Space Networks to offer advanced communication services globally. Equally, the partnership is expected to boost Terran Orbital's financial performance, generating significant revenue over the duration of the project and strengthening its position in the satellite industry. The constellation is expected to be deployed as early as 2025.

Maxar Technologies concludes multiple contracts

Maxar Technologies was awarded a 5-years indefinite delivery, indefinite quantity contract, worth approx. $192M, by the U.S. National Geospatial Intelligence Agency (NGA) for the provision of electro-optical, SAR imagery services, and 3D data products to U.S. allies and partners. **Maxar has also secured dedicated access to Umbra's SAR constellation** to offer multisource geospatial intelligence solutions to government and commercial entities.

Additionally, **Maxar has signed a three-year contract with the Guyanese Environmental Protection Agency (EPA)** to provide Crow's Nest maritime Monitoring and Security products to improve vessel activity detection and monitoring, track illegal deforestation, and protect the country's biodiversity.

Credit: MAXAR

Babcock Integrated Technology, SES and Intelsat won a £400M six-year contract

A consortium composed by Babcock Integrated Technology, SES and Intelsat have been awarded a **six-year contract by the UK Ministry of Defence to manage Britain's Skynet military satellite telecommunications system,** replacing Airbus Defence and Space's Skynet 5 Private Finance Initiative contract. The contract was valued at £3.66B. The Babcock group will manage the current Skynet fleet of UHF- and X-band satellites, and the forthcoming Skynet 6A satellite, as well as creating new satellite capacity to replace the current Skynet fleet in geostationary orbit. The contract is valued at £400M ($486.6M) and the Babcock consortium is expected to create around 400 jobs in Britain.

HENSOLDT and FHR partner to enhance German SSA capabilities

Sensor specialist **HENSOLDT and the Fraunhofer Institute for High-Frequency Physics and Radar Technology (FHR)** are teaming up to convert the German Experimental Space Surveillance and Tracking Radar (GESTRA) technology demonstrator, which the Fraunhofer Institute developed on behalf of the German Space Agency at DLR, into a series-production ready, operationally deployable system "Custodian". In order to support the commercialisation of the Custodian technology, HENSOLDT, Fraunhofer FHR and the German Space Agency at DLR established a coordination committee. As part of this collaboration, HENSOLDT secured the required production and commercialisation rights from Fraunhofer-Gesellschaft. The infrastructure, which is part of the EU SST Programme, includes airspace surveillance and missile defence radar capabilities, and has been funded by the Federal Ministry of Economics and Climate Protection (BMWK) through the German Space Agency at DLR.

Peraton awarded $399.3M contract from NOAA

Credit: NOOA

Peraton, a Virginia-based company, has won a contract from the National Oceanic and Atmospheric Administration (NOAA) valued at up to $400M to provide ground services for polar-orbiting weather satellites. The five-year contract, which includes three 12-month options, requires **Peraton to support and maintain the Joint Polar Satellite System Common Ground Services (JPSS CGS).** Peraton will provide communications links for satellites operated by NOAA as well as the agency's U.S. government and international partners. The JPSS CGS fleet is used to collect and distribute environmental data and currently includes three satellites to complete the JPSS fleet with satellites slated for launch in 2028 and 2032.

OHB subsidiaries reinforce European understanding of solar wind and dust clouds

On January 30th, **OHB Czechspace joined the ESA-funded LVICE² mission consortium** aiming to develop a spacecraft tasked to study the space environment around the Moon and at Lagrange's L4 point. The probe will be launched into Earth's orbit in 2027 and it will first manoeuvre into lunar orbit to study turbulence in the solar wind. A second manoeuvre will aim search for the Kordylewsky dust clouds.

Credit: LVICE²

Outstanding advancements in AI for environmental protection

Globally, wildfires destroy 400M hectares annually on a global scale, **UNDRR reports**. EO satellites data coupled with AI provide crucial insights on how to best manage forests and the risks associated with sudden shocks. To this end, the latest EU and the U.S. private and public endeavours show promising results.

EU SWIFTT Consortium awarded €2.8M from EU Horizon Europe

Credit: SWIFTT

The SWIFTT consortium, comprising of multiple institutions across Europe, has been awarded a **cumulative €2.8M contract by the Horizon Europe Programme** to develop an AI and satellite-based solution to monitor forest risks across the continent. The team will operate under the EUSPA-led **"EGNSS & Copernicus applications fostering the European Green Deal" strategy** in partnership with end-users from the forest industry. The project aims to protect up to 40 million hectares of global forests by 2030, saving over €468M in monitoring costs.

IBM partners with NASA to leverage NASA Earth Science Data

The **IBM Foundation and NASA have partnered to leverage NASA Earth Science Data to uncover new insights in Earth observation**. The collaboration will utilise IBM's Ai foundation models with data from the U.S. Geological Survey and NASA's harmonised Landsat Sentinel-2 dataset. The partnership aims to detect natural hazards, track changes in vegetation and wildlife habitat, and improve applications for weather and climate predictions.

OneWeb to ramp-up services in Canada and Kazakhstan

OneWeb and Galaxy Broadband Communications Inc. have announced a **multi-year $50M deal to provide OneWeb's low-Earth orbit connectivity solutions across Canada**, including the northern territory of Nunavut. Galaxy has already deployed to more than 75 locations throughout Canada, and the deal enables it to support the digital transformation of enterprises, communities, civil, and military government users. In a separate agreement, OneWeb and Kazakhstan National Railways Company signed an **MoU to explore the provision of high-speed, low-latency broadband satellite connectivity for railway stations and rolling stock across Kazakhsta**n, facilitating the transformation of the National Railways into an international multimodal digital logistics operator.

Ovzon AB looks at other launch windows after delays

The Swedish SATCOM-as-a-Service provider Ovzon AB announced it will not be able to launch its Ovzon 3 satellite onboard one of Arianespace's last two Ariane 5 launches in Spring 2023. The reason is to be found in the **delays cumulated by the American satellite-manufacturer Maxar Technologies**. To accommodate the launch window, Ovzon turned to SpaceX's Falcon 9 rocket for a ride to geostationary orbit. Although the delay of Ovzon 3 is expected to increase the total cost of the 1.5-metric ton spacecraft by approximatively $25M, the Swedish company has been reassured to be included on a launch manifest between July and September. Nonetheless, **Ovzon declared it has enlarged an existing $60M loan facility by $5M** to prevent the negative externalities associated to increasing costs.

Virgin Orbit in-between investigations and new agreements

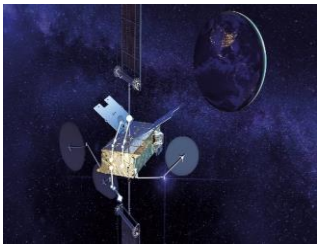
Credit: Virgin Orbit

Virgin Orbit's CEO Dan Hart revealed that the **failure of the January 9th "Start Me Up" mission** has been caused by the dislodgement of a fuel filter, resulting in a decreased amount of fuel reaching the rocket engine. That, in turn, has increased the temperature of the engine, provoking is premature shutdown. While the company did not disclose when it expects the investigation to be complete, it announced a **follow-on launch services agreement (LSA) with the Polish satellite manufacturer SatRev** for additional launches of up to 500 kg as soon as 2023 and beyond.

SpaceX to restrict military use of Starlink by the Ukraine

SpaceX moved towards restricting Ukrainian military's uses of its satellite internet service Starlink after claims that the Ukrainian defence was relying on the constellation to control drones. **According to SpaceX President Shotwell**, the service was "never meant to be weaponised" and that "Ukrainians have leveraged it in ways that were unintentional and not part of any agreement."

Thales Alenia Space SolarFlex slated to be deployed on INSPIRE satellites



Credit: Thales Alenia Space

Thales Alenia Space has completed the assembly and testing of a full-scale engineering model of SolarFlex, a flexible solar array designed to wrap around a rail like an automatic roller blind. SolarFlex offers high power density and takes up less space compared to previous models and is part of Thales Alenia Space's INSPIRE product line, that can accommodate two such satellites under a launcher's fairing. The SolarFlex solar array is developed in partnership with the Czech BSTG consortium and supported by CNES, the Czech government, and the Belgian (BELSPO).

In other news

CisLunar Industries and its partners have won a $1.7M contract: The consortium will develop a circular propulsion ecosystem for recycling metal in space on behalf of SpaceWERX, the innovation arm of the U.S. Space Force.

Sidus Space secures $2.4M to deploy TNO's HemiCAT communication laser terminals: The company will integrate the technology into its LizzieSat satellite, which it will then deploy and manage, with the in-orbit demonstration mission set to be part of a study of Dutch defence technology.

New Frontier Aerospace (NFA) awarded $1.5M contract from DoD National Security Innovation Capital (NSIC): NFA will finalise its 3D printed Mjölnir rocket engine and used on a hypersonic aircraft to transport passengers and cargo anywhere in under two hours, with net negative greenhouse gas emissions.

Thai software company Patriot Infovention signs contract with D-Orbit: the LOGSATS CubeSat will demonstrate Thailand's IoT communication systems and aviation monitoring system and will be integrated on an ION Satellite Carrier and is scheduled for flight in October 2023.

Vyoma and EnduroSat sign MoU to improve the sustainability of space activities: The companies will develop real-time tracking data and trajectory predictions and will launch space-based telescopes to track space debris from 2024.

ECONOMY & BUSINESS

New Fund for European Tech Startups

Five EU member states Spain, Germany, France, Italy, Belgium and the European Investment Bank

Group founded the **European Tech Champions Initiative (ETCI) with initial commitments of €3.75B**. The initiative is open to further contributions by other EU member states.

Country/Institution	Commitment
France	€1000M
Germany	€1000M
Spain	€1000M
EIB Group	€500M
Italy	€150M
Belgium	€100M

Credit: ESPI

ETCI is organized as a fund of funds, meaning that it will invest in large venture capital and private equity funds. These funds will, in turn, invest in European tech startups. This approach hopes to mobilise private money,activating more than €10B of additional private funding. The Initiative aims to fill a gap in the European funding ecosystem for startups by focusing on late-stage and growth capital, as opposed to early-stage investments, typically seed or series A rounds.

The initiative could represent an opportunity for some European space startups, but its effect on the space ecosystem will likely remain limited. First, the ETCI hallmark is to **support late-stage startups seeking to raise more than €50M**, but only few European space companies have reached this level of development: according to **ESPI's Venture Database**, only six European space startups have raised €50M or more between 2014 and 2022. Second, the Initiative will invest in funds worth approximately €1B, while European space-focused funds are significantly smaller. Nevertheless, ETCI may ease access to growth capital for future European space champions.

Two new Venture Funds for Space

L.A.-based Embedded Ventures has **launched a $100M fund focused on national security and space**. The firm had previously invested in space-startups on a case-by-case basis, and is now launching a dedicated fund, which it expects to reach the envisaged value by the end of the second quarter. In Israel, Earth & Beyond Ventures has raised **$70M to date and has commitments of $125M for the next five years to invest in Israeli space startups.** The focus of the fund are dual-use technologies with applications on Earth as well as in space. The fund expects to write half a dozen checks this year, worth between $0.5M-$2M for early-stage companies. The Israel Innovation Authority will quadruple each dollar invested by Earth & Beyond Ventures.

Voyager Space raises $80M to continue development of Starlab space station

Credit: Credit: Nanoracks

The U.S. company Voyager Space **raised $80.2M in new capital**. NewSpace Capital, Midway Venture Partners, Seraphim Space and Industrious Ventures participated in the funding round. The new funding will be utilised to continue the development of the private space station Starlab, which started in October 2021 in cooperation with Nanoracks and Lockheed Martin and was already backed with $160M funding awarded by NASA under the Commercial LEO Destinations program.

The Exploration Company secures €40M funding

Credit: The Exploration Company

The Exploration Company secured €40.5M in Series A funding in a round led by EQT Ventures and Red River West, with participation of new and existing investors, including Promus Ventures, Cherry Ventures, Vsquared (the three seed investors) as well as Omnes Capital, July Fund, Partech, Possible Ventures, Habert Dassault Finance, Schlumberger, and Sista Fund (new investors). The Exploration Company will use the new capital to expand its team, commercialise its first space capsule Nyx Mission Odyssey, which from 2026 will fly goods to space stations and return to Earth in a controlled re-entry, using green propellants, as well as to complete and test launch its second capsule demonstrator, planned for 2024. This marked a record Series A funding round for Europe.

SpaceQuest Ventures invests in Kreios Space

The Swiss investment company **SpaceQuest Ventures invested in the Spanish company Kreios Space** i.a. to provide Kreios Space with individual start-up support, mentorship, and network benefits from SpaceQuest Ventures' accelerator program. Specifically, SpaceQuest will support Kreios Space to push its electric propulsion system for satellites with the ABEP (Air-Breathing Electric Propulsion) technology faster to the market.

CS GROUP acquires HE SPACE

The French information technology service company **CS GROUP acquired the Netherlands-based space engineering company HE SPACE** with 100% of the capital, to strengthen its presence in Europe. The acquisition is based on an Enterprise Value of €11.5M. The new entity counts approx. 800 employees in the space sector, with sales of ca. €90M - 50% in France and 50% in Europe. The group now has closer ties with institutional organisations (incl. ESA's ESOC and ESTEC, and EUMETSAT) and manufacturers (incl. Airbus, Thales Alenia Space and OHB), and will strengthen its installed base in the Netherlands, Germany, and France, while expanding to Spain and the UK.

Airbus D&S unveils 44,8 % pretax profit decrease due to Pleiades satellites loss and Ariane 6 delay

AIRBUS
DEFENCE & SPACE

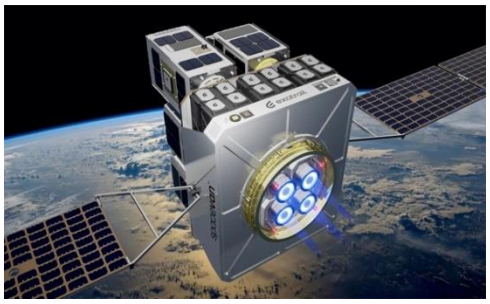
Credit: Airbus Defence and Space

The Airbus' Defence and Space division reported a **44.8% pretax profit decrease for 2022**, (in adjusted EBIT) from €696M in 2021 to €384M in 2022, due to the loss of the two Pleiades Neo EO satellites in the Vega C December launch failure and the continued delay of Ariane 6 (now planned in Q4/2023) - on top of the general inflation effects. The loss of two Pleiades satellites caused €200M profit decrease, but these charges will likely be offset in 2023 on payment of a €200M insurance claim for the loss. Regarding the decrease of profit due to the Ariane 6 delay comes from Airbus D&S and the other Ariane 6 contractors having built manufacturing facilities to support an annual production rate of 7 Ariane 6 launch vehicles - and now the delay has a full backlog for its first years of operations. The transition from backlog to revenue depends on whether the ArianeGroup-led industrial team can ramp production assuming a successful inaugural flight.

Astroscale closes successful Series G funding round

Astroscale, a Japanese startup that is developing technology for orbital debris removal and on-orbit servicing, **completed a Series G funding round of $76M** to accelerate its growth and development that brings the company's total funding to $376M. The Series G was entirely funded by new investors, including Mitsubishi Electric, Yusaku Maezawa, Mitsubishi UFJ Bank, Mitsubishi Corporation, Development Bank of Japan, and FEL Corporation. **Mitsubishi Electric has pledged $25M** and announced a collaboration with Astroscale to build more sustainable satellite buses for Japanese national security constellations. Meanwhile, the **Japanese billionaire Yusaku Maezawa contributed $23M**.

Exotrail secures $58M in Series B round



Credit: Exotrail

The French end-to-end space mobility operator **Exotrail has raised $58M in a Series B round** led by Bpifrance, Eurazeo, and CELAD, as well as existing investors. The company plans to use the funding to scale up production of its electric propulsion systems and expand its mobilityhub, which includes mission design software, operations software, and a space logistics service called spacedrop.

Exotrail's orbital transfer vehicle spacevan, which uses its electric thrusters, is set for multiple launches in partnership with Isar Aerospace. The company also plans to expand into the U.S. and Asian markets, hiring 70 employees over the next year.

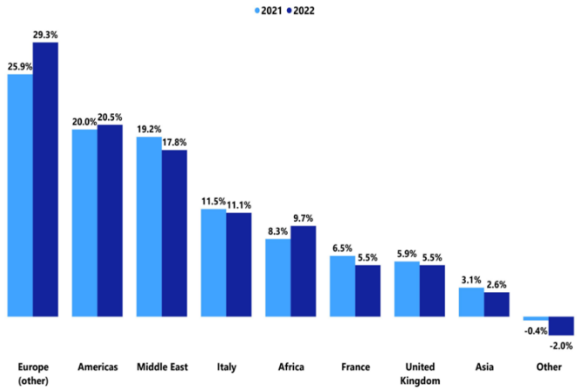
Intuitive Machines completes SPAC merger with Inflection Point Acquisition Corporation

U.S.-based Intuitive Machines has completed its SPAC merger with Inflection Point Acquisition Corp. on February 13th. The merged company will continue under the name Intuitive Machines and will trade on the Nasdaq under the ticker symbol LUNR. Despite anticipating a revenue of more than $330M in cash after transaction expenses, the companies revealed only $55M of "committed capital from an affiliate of its sponsor and company founders." More than 30% of Inflection Point shareholders voted against the merger and related provisions, which is an unusually high number for a SPAC transaction.

However, despite raising less money than anticipated, the deal will help Intuitive Machines to continue the development of a series of commercial lunar landers and related infrastructure. Intuitive Machines projected $102M in revenue for 2022, up from $73M recorded in 2021, with accelerating growth forecasted for $759M in revenue in 2024. The company is estimated to have earnings before interest, taxes, depreciation, and amortization (EBITDA) loss of $14M for 2022, with that loss increasing to $46M in 2023 before the company breaks even in 2024.

Credit: Intuitive Machines

Eutelsat reports revenues in Africa and Europe



Credit: Eutelsat

According to a recent financial report, **Eutelsat earned €55.7M from Africa as of December 31st, 2022**, marking a 1.7% rise from the corresponding period in 2021. Furthermore, the company's overall revenue across all geographical markets amounted to €573.8M, which represents an increase from €572.2M in the same period the previous year.

Therefore, Eutelsat has reported that its financial objectives have been confirmed despite a 4.1% decline in operating verticals revenue. This decline is within the range of full-year objectives, and the company expects fixed broadband to be stable over the full year due to contracts with Orange, TIM, Hispasat, and Swisscom in Europe and Africa. Growth is expected to reaccelerate in FY 2023-24 with the entry into service of Konnect VHTS, Hotbird 13F, Horbird 13G, and Eutelsat 10B. On February 17th, Eutelsat's CEO Eva Berneke stated that the **company delivered a solid first half and maintained industry-leading profitability** with a 73% EBITDA margin.

In other news

Orbital Sidekick raises $10M investment round: The round led by Energy Innovation Capital included participation from customers and existing investors. The additional funding will be utilised for the preparation of the launch of the six Global Hyperspectral Observation Satellites (GHOSt).

Astroscale wins Dstl funding for exploration of future space-based SDA missions: The study, worth £100T, will advance knowledge a comprehensive review of current technologies and techniques, explore future developments to 2030 and beyond, and assess space-based vs. ground-based capabilities for SDA.

Boecore acquired mission planning and scheduling software developer Orbit Logic: The company aims to expand its footprint in the space sector through Orbit Logic's suite of software tools for on-demand access to commercial satellite imagery.

Northrop Grumman Corporation enters agreement with Bank of America: The Bank will repurchase $500M of its common stock, with the aim of returning more than 100% of its free cash flow to shareholders through dividends and share repurchases in 2023. The ASR agreement is expected to be completed Q2 2023.

Tianbing Technology has completed Pre-C and B+ rounds of financing: The Chinese spacecraft manufacturer will boost the development of Tianlong-3 liquid launch vehicle, rocket engines, launch site construction, and talent team improvement. The company has received nearly ¥3B ($435M) in capital reserves from 10 rounds of financing in four years.

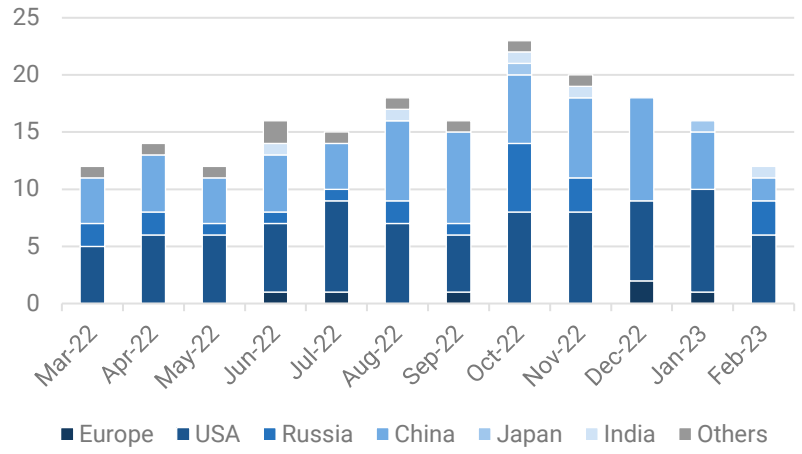
Asteroid Mining Corporation opens Series A funding round and announces new subsidiary: The new U.S. based subsidiary is called Asteroid Mining Co USA, LLC.

LAUNCHES & SATELLITES

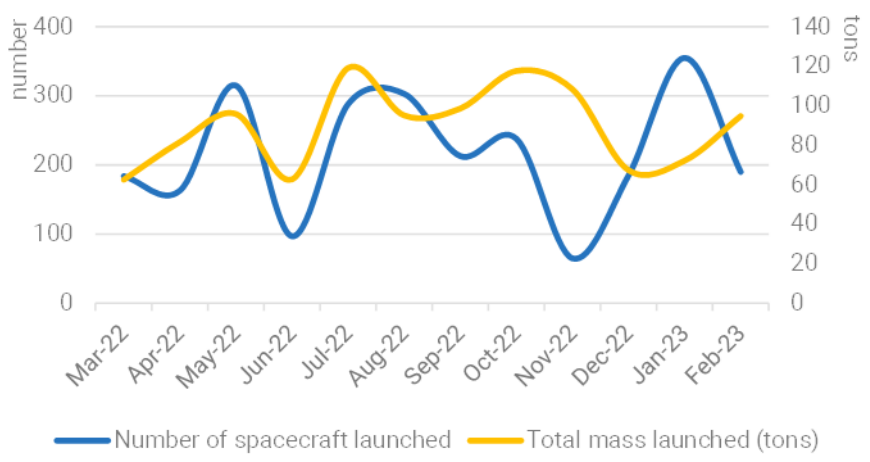
Global space activity statistics

February 2023	USA	Russia	China	India	Total
Number of launches	6	3	2	1	**12**
Number of spacecrafts launched	182	3	2	3	**190**
Mass launched (in kg)	73 675	15 670	5300	174	**94 819**

Launch activity over the year

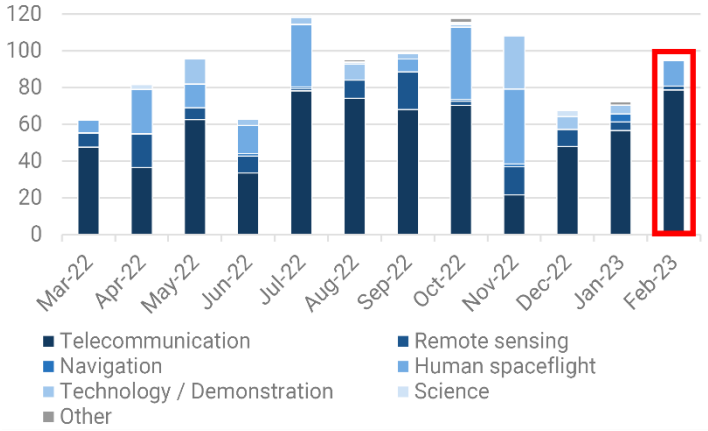


Evolution of the number of launches per launch country



Evolution of launch activity over the year 2022-2023

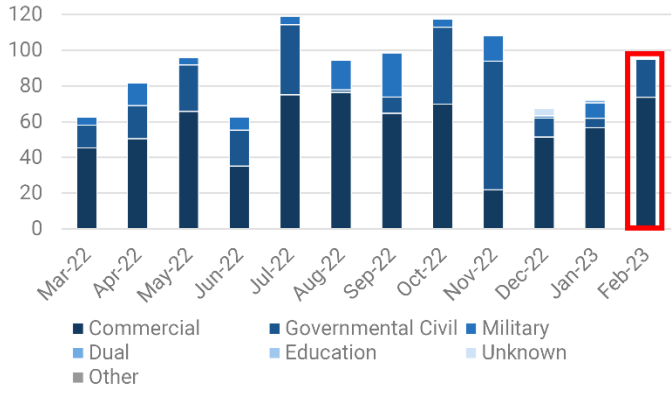
Satellite missions and markets



Evolution of the total mass launched (tons) per mission (Mar. 2022-Feb. 2023)

February 2023	Telecommunication	Remote sensing	Human Spaceflight	Technology/ Demonstration
Europe	9970			
USA	63 705			
Russia		1620	14050	
China	5000			
India		156		18
Others		300		

Total mass (kg) launched by mission and customer country



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

February 2023	Commercial	Governmental Civil	Education
Europe	9970		
USA	63 705		
Russia		15 670	
China		5000	
India	10	156	8
Others		300	

Total mass (kg) launched by market and customer country

Launch Log

Launch date	Launch country	Launcher	Spacecraft name	Main customer	Customer country	Prime manufacturer	Manufacturer country	Mass (kg)	Mission	Market
02/02/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (53 satellites)	SpaceX	USA	SpaceX	USA	295 (each)	Telecom	Commercial
05/02/2023	Russia	Proton-M Blok-DM-3	Elektro-L 4	Roscosmos	Russia	Lavochkin	Russia	1620	Meteorology	Governmental Civil
07/02/2023	USA	Falcon-9 v1.2 (Block 5)	Amazonas Nexus	Hispasat	Spain	Thales Alenia Space	France	4500	Telecom	Commercial
09/02/2023	Russia	Soyuz-2-1a	Progress-MS 21 (Nº452)	Roscosmos	Russia	RKK Energia	Russia	7000	Cargo Transfer	Governmental Civil
10/02/2023	India	SSLV	AzaadiSAT 2	Space Kidz India	India	Space Kidz India	India	8	Technology / Demonstration	Education
			EOS07	ISRO	India	ISRO	India	156	Earth Observation	Governmental Civil
			Janus 1	Antaris	India	Antaris	India	10	Technology / Demonstration	Commercial
12/02/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (55 satellites)	SpaceX	USA	SpaceX	USA	295 (each)	Telecom	Commercial
17/02/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (51 satellites)	SpaceX	USA	SpaceX	USA	295 (each)	Telecom	Commercial
18/02/2023	USA	Falcon-9 v1.2 (Block 5)	Inmarsat-6 F2	Inmarsat	United Kingdom	Airbus	France	5470	Telecom	Commercial
23/02/2023	China	CZ-3B/G2(2)	ZX 26	China Satcom	China	CAST	China	5000	Telecom	Governmental Civil
24/02/2023	Russia	Soyuz-2-1a	Soyuz-MS 23	Roscosmos	Russia	RKK Energia	Russia	7050	Crew Transfer	Governmental Civil
24/02/2023	China	CZ-2C(3)	Horus 1	EgSA	Egypt	DFH Satellite Co.	China	300	Earth Observation	Governmental Civil
27/02/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (21 satellites)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial

Launch Highlights

First successful launch of India's SSLV rocket

Credit: ISRO

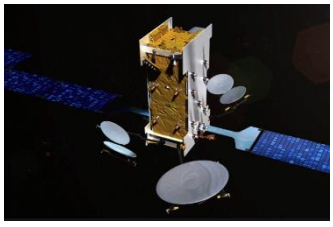
After the failed launch of India's new **Small Satellite Launch Vehicle (SSLV)** on August 7th, 2022, the second attempt on February 10th, 2023, was successful. The first payload is the small Earth observation satellite EOS 07, developed by ISRO, to test the SSLV's launching capabilities and its responsiveness. It is based on the Microsat-TD, launched by ISRO in 2018, and additionally carries a Millimeter Wave Humidity Sounder and a Spectrum Monitoring Payload. The other two satellites are AzaadiSAT 2, a nanosatellite developed by Space Kidz India and Janus 1, a CubeSat demonstrating the platform developed by Antaris. Compared to India's GSLV and PSLV rockets, SSLV is designed to provide more affordable and flexible access to space.

Credit: Egypt Independent

China launches Egyptian Horus 1

On February 24th, a Long March 2C transported Egypt's **Horus 1** satellite into a Sun-synchronous orbit. The ninth Egyptian satellite will be used for Earth observation and is equipped with a high-resolution imaging camera. In previous launches, Egypt cooperated with agencies in the United States, Russia, Europe, and Japan but this one was the first to be carried out by a Chinese launch provider (CASC). Prior to the launch, the payload was kept secret, but the Egyptian Space Agency (EgSA) revealed it after its successful deployment. After the launch, the CEO of EgSA used the opportunity to stress that Egypt and China will pursue their strategic cooperation in the field of space and for the launch of satellites.

Hispasat's Amazonas Nexus Launch



Credit. SpaceWatch Global

Hispasat's Amazonas Nexus satellite was launched February 6th by SpaceX from Cape Canaveral. The satellite, built by Thales Alenia Space, will be the first Amazonas satellite launched by a Falcon 9, while past flights have used either Ariane 5 or Proton-M rockets. It will provide communications in all of the Americas for Hispasat's aerospace, naval and land Internet customers. A key innovation of the Amazonas Nexus is the new generation Digital Transparent Processor (DTP), which allows to extend the mission's geographic flexibility and adapt to potential changes in the commercial situation. It also **hosts the Pathfinder 2 mission, a high bandwidth shielded communications transponder from the Space and Missile Systems Center of the US Space Force**. This is the third Pathfinder project, which aim at providing wideband alternatives to meet the Space Force's satellite communications needs while using already available commercial technologies.

Replacement capsule arrives at the ISS

On February 24th, Roscosmos launched the crew transporter **Soyuz MS-23**. Unlike similar missions, the capsule was uncrewed as it aimed primarily at replacing the defective Soyuz MS-22. MS-22 carried three astronauts (two Russians and one American) to the ISS in December 2022 and was scheduled to return three others to Earth as part of the normal crew rotation. However, it was unable to make the return flight due to a leak in the radiator caused by a micro-meteorite impact and, therefore, remained docked to the ISS until replaced by MS-23.

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Part of a network of European and international partners	Organization of thematic conferences and workshops

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