



**ESPI**

European Space  
Policy Institute

# ESPI Insights

## Space Sector Watch



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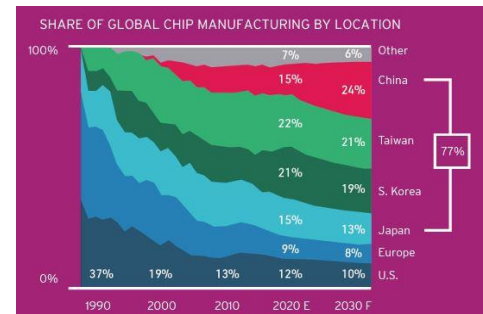


## WINNING THE FUTURE - WHAT EUROPEAN SPACE POLICY NEEDS TO LEARN FROM SEMICONDUCTORS



Transformative technologies impact our daily lives. They are all pervasive across sectors of the economy. A world without e-commerce is hard to imagine today. The disruptive impact of AI may bring the deepest systemic changes nations and people will face in the Digital Age. Such disruptive transformation has far reached economic, societal and geopolitical repercussions.

Europe historically has been at the forefront of future-shaping innovation, defining centuries. The printing press in 1439 by Johannes Gutenberg for the spread of knowledge, the steam engine in 1763 by James Watt, powering the industrial revolution, Guglielmo Marconi in 1901 demonstrating the first transatlantic radio signal. And many more. However, over the past decades Europe lost its pioneering role. This is most visible in the digital revolution, which has been dominated by the computer and software industries symbolised by the “Silicon Valley”, initiated with the invention of semiconductors in 1947 by William Shockley. While in 1990, Europe was home to almost half of the global chip manufacturing, its share fell to below 10% by 2020. In contrast, China’s share rose from zero to 15% and is projected to reach 24% by 2030, surpassing Taiwan with 21%. Europe missed the opportunity to develop market and industry capability in one of the future key sectors of the economy. Recently, this cumulated in a semiconductor supply chain crisis, affecting numerous key industries such as automotive. Decades with a lack of a clear European policy vision results in a cost of inaction measured in Trillions of Euros today. The European Chips Act, re-Acts to cushion the impacts of Europe’s systemic dependence. Multiple billion Euros of public investment will be made available in the hope of regaining an EU’s share of global chip manufacturing of 20%. In total, the package represents at least €43B in public and private investments.



Credit: Semiconductors Manufacturing Association

As Europe takes costly corrective action in an established market, another new and game-changing industry is at an inflection point today. A global space race is unfolding, a race of geopolitical influence as much as in a conquest for new markets on Earth and in outer space. Space solutions in Earth observation, navigation and communications are key enablers of the digital economy, of a green future, of crisis response systems, of security and defence solutions. Technologies developed for exploration endeavours, for example, in-orbit manufacturing, and closed loop life support systems, are bound to further impact our terrestrial economies and societal needs. An ongoing study by ESPI together with BCG demonstrates the catalytic benefits of space on the wider economy. It also shows that the space and semiconductor sectors have many commonalities. Both are disruptive and all-pervasive through different industry sectors. Both are R&D intensive and globally in the focus of public policy action for industrial capacity building. Both are comparable in market size and growth rates, with a CAGR of 5% expected by 2030. Most importantly, both show a similar multiplier effect (factor 6-7) into the broader economy, with space solutions today resulting in a significant GDP level impact of €3.1T. The benefit of space-enabled weather forecasting alone is estimated by the World Bank at \$160B annually. A 2018 [study by PwC](#) found that 6.2% of the EU's GVA was dependent on space infrastructure. As this is being understood by some leaders, efforts are initiated to develop synergies between champions in key sectors of the economy and space policy actors, such as by the Swiss Space Office with pharmaceutical, the German Aerospace Center with automotive, and the Luxembourg Space Agency with finance. This demand and market driven space policy could be part of the “European way” called upon so often. It could connect public investments in space infrastructures and services with that of industry champions, in synergy with ministries like energy, health, transport or digital.

This requires urgent space policy action, to preserve Europe’s 15% share of the €100B global public investment in space, to scale up to the ambition of 1/3 of market share as set by the recent “Revolution Space” report. It may well be the European challenge of the decade, to establish more co-creation of space programs between public and private space actors and sectorial leaders, already investing billions in innovation, for developing opportunities for private and public markets and for societal benefit.

Europe in space needs to act now, to avoid the same fate as in semiconductors. A Space Act in 2040, would no longer allow us to recover the space left uncharted today. Decisive policy action can still secure the evolution of Europe’s space industry, European capability and capacity, security of supply and choice of action. Ultimately, this will contribute to prosperity and peace for future generations.

Yours sincerely,

Hermann Ludwig Moeller

Director of ESPI



## POLICY & PROGRAMMES

### June saw new European initiatives for space sustainability

#### ESA launches Zero Debris Charter initiative



*Credit: Airbus*

During the 2023 Paris Air Show Le Bourget that took place from June 19th until 25th, [ESA](#) announced the [Zero Debris Charter](#) initiative, which is initially supported by Airbus Defence and Space, OHB SE and Thales Alenia Space with the goal to build a community of partners promoting and implementing the safety and long-term sustainability of space operations. As part of this new initiative, ESA is updating its internal space debris mitigation standards and calls on all

European space stakeholders to display ESA's commitment "towards achieving global leadership in space debris mitigation and remediation [...]". The new Charter aims to bridge ESA initiatives in this field and is facilitated under its [PROTECT Accelerator](#) – one of the three Accelerators of ESA to boost the use of space. The charter will be co-developed with interested European space actors to identify targets to be achieved by 2030 and formulate the text of Charter envisaged to be completed by the end of 2023.

Also in June, the World Economic Forum in collaboration with ESA released the [Space Industry Debris Mitigation Recommendations](#) and ESA published the [2023 edition of its annual Space Environment Report](#).

#### CNES signs contract with Astroscale for active debris removal study

Also, during Le Bourget, [CNES and Astroscale Holdings Inc. signed a contract](#) which formalises their partnership and includes a funded study for active debris removal (ADR) of French space debris to be determined in early 2024. Moreover, Astroscale announced to open Astroscale France SAS to be incorporated in Paris. Following the contract with CNES for a study on ADR and the active removal of French space debris, [Astroscale signed a contract with the French startup Share My Space](#), which will enable Astroscale to better assess space objects' attitude in orbit .

#### King Charles unveils the Astra Carta seal for Space Sustainability

During the UK's Space Sustainability Reception at Buckingham Palace, in which King Charles has welcomed astronauts, business leaders, environmentalists and scientists, [King Charles unveiled the "Astra Carta" seal, marking the launch of the Sustainable Markets Initiative's Astra Carta framework](#). In 2022, he announced the ambition to establish his Sustainable Markets Initiative to create an "Astra Carta" supposed to provide a framework to convene the private space sector in developing and accelerating sustainable practices and activities for space sustainability across the UK and global space industry. Moreover, the Carta recognises the role of space for a sustainable future on Earth.



*Credit: Royal UK*





## Aarti Holla-Maini appointed Director of UNOOSA

Aarti Holla-Maini was appointed Director of UNOOSA by the UN Secretary General Antonio Guterres. She will succeed Simonetta Di Pippo (Italy). The Chief of the Committee, Policy and Legal Affairs Section, Niklas Hedman, will continue serving as Acting Director of UNOOSA until Holla-Maini assumes this position. Currently, she is Executive Vice-President Sustainability, Policy & Impact at NorthStar Earth & Space.



Credit: UNOOSA

## Ready for the Moon: ESA high-level conference on Europe's lunar ambition



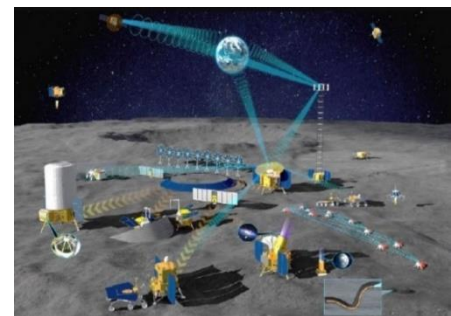
Credit: ESPI

On June 2nd, a high-level conference “Ready for the Moon”, organised by ESA in cooperation with the Federal Chancellery of the Republic of Austria, took place in Vienna, discussing Europe’s future ambition in space exploration. The conference focused on the findings and recommendations from the final report of the High-Level Advisory Group (HLAG) on the future of human and robotic space exploration for Europe with regard to the international, economic, and societal importance of space

exploration for Europe and how to move forward. [ESPI Director Ludwig Moeller joined the panel on the Economic Importance of Space Exploration for Europe](#). ESA is now working to realise this vision and will present its plans to its Council during a Space Summit in Seville in November.

## China outlines timeline and partners for International Lunar Research Station

June saw China unveiling further updates on its International Lunar Research Station (ILRS) Moon base project. The ILRS project, which was initially presented as a Chinese-Russian joint project in 2021 is now presented as China’s own following Russia’s invasion of Ukraine, aims to construct a permanent Moon base that will be implemented within the next decade in 5 missions. The ILRS is slated to occur in three stages – reconnaissance, construction and utilisation. For project coordination and management, China announced in April to establish the International Lunar Research Station Cooperation Organization (ILRSCO). According to a report of China’s state-owned Ta Kung Pao, several countries committed to join China’s International Lunar Research Station (ILRS) Moon base initiative, with Russia, Pakistan, the UAE and the Asia-Pacific Space Cooperation Organization (APSCO) having signed agreements and more than 10 other countries and organisations (incl. Malaysia and Venezuela) currently in talks or negotiating agreements with China. Further updates include - according to the China National Space Administration (CNSA) – that China aims to complete the signing process of agreements with space agencies and organisations for founding members of ILRSCO by October. Moreover, reportedly, China aims to define the task sharing for ILRS as well as approve and sign intergovernmental agreements among the ILRSCO’s founding countries before the end of 2024.



Credit: DSEL

Moreover, China’s Tiangong Space Station achieved a new premiere by successfully installing an electric propulsion system gas cylinder in-orbit with a robotic arm for a gas exchange method.



## Germany releases new national security strategy, with links to space

Germany released its new national security strategy “Wehrhaft. Resilient. Nachhaltig. Integrierte Sicherheit für Deutschland“. The [strategy](#) revolves around 3 main pillars: (1) Defence (2) Resilience, (3) Sustainability. Space is addressed within the pillars (1) Defence and (2) Resilience.

### (1) Defence:

- Defence and deterrence to prevent armed conflicts. Capabilities in the transatlantic alliance to counter all military threats (nuclear, conventional, cyber defence and threats directed against our space systems).
- Strengthen European capabilities in NATO, including cyber and space.



Credit: Die Bundesregierung

### (2) Resilience:

- Importance of cooperation within the EU and NATO and international partnerships.
- Strengthening the resilience of space systems and space infrastructure.
- Responsive Space: Measures to be able to quickly replace failed systems.
- Supporting multilateral efforts for development of internationally recognised principles for responsible behaviour in space and a commitment not to carry out any destructive anti-satellite tests.
- Security in space: detection of space threats, expansion of the space situational awareness centre, further development of reaction mechanisms.
- Development of a national space security strategy, which defines future lines of action for protection and defence in space and for increasing the resilience of the state as a whole and describes measures to strengthen military capacity to act through the use of space.

## Japan adopts space security policy and plans to enable JAXA to invest in private companies

Based on the National Security Strategy updated in December 2022, [Japan adopted its first space security policy](#), which aims to enable Japan to enhance the utilisation of space for defence over the next decade, in order to be prepared and in response to China’s and Russia’s increasing use of space for military purposes. Japan’s Prime Minister Fumio Kishida stated: “for the sake of national security, we will dramatically scale up the use of space systems and ensure the safe and stable utilisation of the domain”. In particular, the policy:

- outlines a roadmap to strengthen information-gathering systems with the aim to increase counterstrike effectiveness/capabilities, i.a. through the acceleration of information transmission by combining multiple small satellites and through improving their visual data interpretation technologies by using AI.
- commits to advance Japan’s national defence projects, by the use of private-sector space technologies, as part of Japan’s attempt to accelerate the integration of its defence and civilian sectors – referring to U.S.’ and Europe’s use of data from commercial satellites to support Ukraine’s defence and military operations. To achieve this, Japan aims to increase the internal cooperation between the Defence Ministry and JAXA.
- Envisages increased international cooperation for the protection of satellites with the U.S. and other allies.

Moreover, another development in Japan’s space policy is on the way: a new legislation is currently in the works which will enable [companies to fund privately initiated projects](#).



### June's updates on European launch vehicles

A turbulent June led Europe's launching capabilities at the crossroad, with accumulated backlogs and revitalising initiatives.

While the 117th and last launch of an Ariane 5 rocket was scheduled to bring the secure communications satellites Syracuse 4B for the French government, and the Heinrich-Hertz-Mission on behalf of the German Space Agency at DLR into orbit in June, an [issue with the heavy-lift rocket's pyrotechnical systems postponed its retirement](#). The last Ariane 5 is now [scheduled to launch on July 5th](#). Moreover, [Vega C's Zefiro 40 \(Z40\) second stage malfunctioned during a static-fire rehearsal](#), further postponing the vehicle's return to flight to 2024. Consequently, Europe's most recent space initiatives, including Euclid for the exploration of the dark Universe and EarthCARE for the observation of clouds and aerosols, rely on foreign service providers. [Euclid was launched with SpaceX' Falcon 9 on July 1st](#), while EarthCARE, in partnership with JAXA, [will fly on a Falcon 9 rocket at the beginning of 2024](#).

Moreover, [ESA launched the Commercial Cargo Transportation Initiative](#), inviting private companies to develop services to transport cargo to human outposts in LEO and to the ISS.

### U.S. Space Force to expand national in-orbit and ground station missile warning capabilities



*Credit: Raytheon Intelligence & Space*

As highlighted in a [report by Aerospace Center for Space Policy and Strategy](#) issued in June, recent changes in the U.S. Space Force budget for fiscal year (FY) 2024 reflect the department's push toward more spacecraft in lower and medium orbits, and reinforces the growing consensus in the administration and Congress to accelerate the uptake of commercial solutions in military systems. Satellite-based missile warning systems are no exception.

In this respect, the [Space Force awarded L3Harris Technologies a \\$29M contract](#) to design a sensor payload that can track hypersonic missiles from MEO. The recent contract adds up to two previously selected deals that see [Millenium Space Systems and Raytheon Technologies](#) designing sensors for the MTC Epoch 1 (missile warning, missile tracking, and missile track custody) Program, and a [contract awarded to Parsons](#) for the development of the ground system. The planned constellation of at least six satellites will be deployed in MEO in late 2026.

Similarly, [a ground station for missile warning satellites being developed by Northrop Grumman](#) has recently passed a preliminary design review. The Relay Ground Station-Asia (RGS-A) terminal counts six antennas, it was initiated by the U.S. Naval Information Warfare Center (NIWC) Pacific under a five-year \$99.6M contract and aims to facilitate communications between different satellite networks that detect missile launches.

### U.S. Senators introduce Spaceport Act to enhance spaceport activities

U.S. Senators introduced the bipartisan [Spaceport Project Opportunities for Resilient Transportation \(SPACEPORT\) Act](#). The Spaceport act aims to encourage the development of commercial spaceports through the modernisation of the Space Transportation Infrastructure Matching (STIM) grant program of the Federal Aviation Administration's (FAA).





## Ecuador and India sign Artemis Accords, India and U.S. expand spaceflight cooperation

In June, Ecuador and India sign Artemis Accords. [Ecuador is the 26th country to sign the Artemis Accords](#) and is the fourth nation in Latin America - succeeding Brazil, Colombia and Mexico.

[India signed the Artemis Accords](#) during a visit of Indian Prime Minister Narendra Modi to the U.S. as part of a broader partnership agreements. India is the 27th nation to sign the Artemis Accords. Beyond (and on this basis), the [U.S. and India agreed to expand cooperation in spaceflight](#), planning a joint mission to the ISS. According to a joint fact sheet, NASA and ISRO plan to develop a “strategic framework for human spaceflight cooperation” by the end of 2023 and have the goal of launching a joint mission to the ISS in 2024. The launch of India’s own crewed spacecraft Gaganyaan, still under development, was delayed and is now expected not before 2025. A joint project is the NASA-ISRO Synthetic Aperture Radar (NISAR) Earth science mission, with a spacecraft built by ISRO which will use a radar provided by NASA, scheduled to launch in early 2024 on an Indian rocket.



*Credit: White House*

## India explores potentials of space cooperation with several countries

Beyond the commitment of India to enhance ties in space cooperation with the U.S., June saw multiple efforts of India to explore space cooperation opportunities with several countries.

### India and Kenya

During a visit of the Indian Navy in Nairobi which aimed at intensifying bilateral relations in the defence sector, Kenya’s Cabinet Secretary for Defence Hon. Aden Duale and the Indian delegation led by Vice Admiral Sanjay Mahindru, Deputy Chief of Naval Staff, and Her Excellency Ms Namgya Khampa, the Indian High Commissioner to Kenya, also [discussed space cooperation opportunities and cooperation between the Kenya Space Agency \(KSA\) and the Indian Space Research Organisation \(ISRO\)](#). In defence, India and Kenya fostered a strong cooperation over the past years, including joint military training and games, information sharing, and military medical services. Areas of potential space cooperation include satellite technology, remote sensing, space research, science and technology, and space exploration. These areas of potential future cooperation aim to expand scientific knowledge, strengthen national security capabilities, and intensify economic development through space-related activities.

### India and Oman

During a bilateral meeting, Oman’s Minister of Transport, Communications and Information Technology Eng. Said Hamoud Al Ma’awali, and the Chairman of ISRO S Somanath reflected and discussed the [areas of cooperation between Oman and India in the space and ICT sector](#).

### India and Egypt

On June 25th, [India and Egypt signed a Strategic Partnership Agreement](#), which paves the way for increased cooperation in various key areas of both countries, such as trade and investment, information technology, defence and security, renewable energy, agriculture, health, culture, and [space](#). It will enable Indian companies to exploit business opportunities in Egypt and in markets in Asia, Africa and Europe, in which Cairo has FTAs with. It was stated that “[defence, security and space are likely to move forward rather fast](#)”.



## June saw several space-related developments in Russia

### Roscosmos is planning to recruit soldiers to support Russian armed forces in the War in Ukraine

According to a [report in the Financial Times](#), Roscosmos, is planning to recruit and train a militia, the “Uran battalion”, to be comprised of employees of Roscosmos and state-owned subsidiaries in the aerospace sector, to support Russia’s military forces in the war in Ukraine. Reportedly, the recruits will receive a 100k ruble (\$1.2k) sign-up bonus, and a monthly frontline duty salary of 270k rubles – which reportedly far exceeds the wages paid at Roscosmos.



*Credit: Roscosmos*

### Russia unveils advanced SSA/SDA capabilities for tracking objects in space

Furthermore, [Russia stated that it enhanced its defence capability for tracking objects in space](#) (Space Domain Awareness/Space Situational Awareness), which enables Russia to detect foreign spacecraft and determine/understand the spacecraft’s purpose/intention more quickly. According to Russia’s MoD, the new system has "unique capabilities for automatic search, detection and control of small space objects (as small as 10cm) in near-Earth space". The new system would be able to detect spacecraft post-launch four times faster and determine their purpose twice as fast by 2027.

### Roscosmos unveils details on the progress and timeline for Russian Orbital Station (ROSS)

In June, [Roscosmos unveiled details on the progress and timeline of the Russian Orbital Station](#). Roscosmos announced that it will select two cosmonauts by 2024 for the inaugural mission to Russian Orbital Station (ROSS), with a training programme expected to be fully developed by 2025. The ROSS LEO space station is Russia’s Post-ISS project. In April, Russia committed to participate in the ISS through 2028 – 2 years before the ISS is planned to be de-orbited in 2030. Reportedly, Russia plans to launch the first power module by 2027, with further four modules to be installed by 2030.

Moreover, the [Russia’s lunar probe Luna-25 is scheduled to launch on August 11th from the Vostochny spaceport](#). Luna-25 will deliver a landing module for research and exploration in the Moon’s south pole area, near the Boguslavsky crater.

### (New) bilateral space cooperation between Russia and Algeria, Egypt and Iran

During a state visit to Russia from June 14<sup>th</sup> to 16<sup>th</sup> 2023, Algeria’s President Abdelmadjid Tebboune, [Algeria and Russia signed a Government Agreement for cooperation in “space exploration and the use of outer space for peaceful purposes”](#), which has the purpose to establish the fundamental terms of bilateral space cooperation. The cooperation is envisaged in the areas (1) space sciences, technologies, and applications; (2) space communications and related services; (3) satellite navigation and related technologies and services; (4) space geodesy and meteorology; (5) training and knowledge transfer in; and (6) international legal regulation of space activities.

Moreover, Roscosmos announced that [Russia and Egypt will sign a cooperation agreement](#) during the [second Russian-African Economic and Humanitarian Forum](#) on July 27<sup>th</sup> and 28<sup>th</sup> in St. Petersburg. During a visit of a Roscosmos delegation in Egypt on June 25<sup>th</sup>, the space agencies discussed cooperation in space, including production and launch of satellites, the development of human spaceflight programmes, space infrastructure, space exploration, and space education.

Furthermore, Iran’s and Russia’s deputy ministers reviewed their technology roadmap to boost bilateral cooperation in information and communication technology (ICT) and [discussed cooperation](#) in the areas of data transit, cyber security, postal services, e-commerce and digital economy, space industry, ICT cooperation and the creation of a joint innovation centre in Iran.



## The UAE boosts ambitions in space cooperation and forges new partnerships

### UAE unveils plan for Emirates Mission to the Asteroid Belt (EMA)



*Credit: UAE Space Agency*

The United Arab Emirates (UAE) unveiled details about a planned Emirates Mission to the Asteroid Belt (EMA) (codenamed Max) between Mars and Jupiter.

The mission is scheduled to launch in March 2028, flying by 6 asteroids within the main asteroid belt - before arriving at a seventh asteroid in 2034. The MBR Explorer spacecraft will carry 4 instruments from American and Italian partners.

According to the UAE Space Agency, more than 50% of the contracted mission will be developed by UAE companies. The UAE Space Agency launched a new campaign called 'Space Means Business' addressing private companies to contribute in 30 different opportunities to the development of the UAE's MBR Explorer spacecraft for the UAE's EMA mission to an asteroid belt.

Moreover, with regard to human spaceflight and according to the Mohammed Bin Rashid Space Centre (MBRSC), the successful Zayed Ambition 2 mission – during which the spacewalk of the Arab astronaut Sultan Al Neyadi took place in April 2023 - has set the course for regular human spaceflights launches every 3 to 5 years.

### Bilateral agreements with France, Brazil and the Philippines

On June 19<sup>th</sup>, the 15<sup>th</sup> session of the UAE-France Strategic Dialogue was held in Paris, co-chaired by Anne-Marie Descotes, Secretary-General of the French Ministry for Europe and Foreign Affairs, and Khaldoun Khalifa Al Mubarak, Chairman of the Executive Affairs Authority, re-affirming their commitment to further enhance cooperation in priority fields and sectors, including energy, climate, science and technology, AI, higher education, health, food security, nuclear, cybersecurity, and also space. France and the UAE are interested to intensify cooperation in space exploration missions, human-spaceflight, as well as the use of space data for monitoring and combating climate change.

Ahead of the 50th anniversary of the UAE's and the Philippines relations, the two nations agreed to strengthen cooperation in innovation and technology, including space and AI. Their space agencies PhilSA and UAESA signed a MoU on space cooperation.

During a visit of a UAE delegation to Brazil from 14<sup>th</sup> to 15<sup>th</sup> June, the representatives of the UAE and Brazil discussed cooperation in space, aviation, science and technology, sustainable development, climate action, renewable energy, food security, agriculture, transport and logistics.



*Credit: WAM*



## Portugal and Angola strengthen space cooperation



*Credit: GGPEN*

During the visit of Portugal's Prime Minister António Costa and the President of the Portuguese Space Agency Ricardo Conde in Angola, they met with the DG of Angola's Space Agency Zolana Rui João. The representatives signed a 5-year MoU for cooperation between Portugal and Angola in the peaceful use of space, space sciences, technologies and applications, including EO for areas such as water resources, forest monitoring, urban planning, as well as land and marine monitoring.

Moreover, the MoU foresees establishing educational initiatives for the development of small satellites, and space(-based) applications, organising joint conferences, seminars, and workshops, as well as creating a technical working committee to promote, monitor its implementation and expand the areas of the bilateral cooperation.

## QUID project kicked off for Italy's implementation of EuroQCI

In June, the QUID (Quantum Italy Deployment) project was kicked off by an Italian consortium selected by the EU to start Italy's implementation of the European Quantum Communication Infrastructure (EuroQCI), which aims to develop a European infrastructure for quantum communication. The consortium is led by the National Institute of Metrological Research (INRiM) and is further composed of the Italian Space Agency (ASI), the National Research Council (CNR), Coherentia, Thales Alenia Space (Italy), QTI, Leonardo, ThinkQuantum, Telecom Italy, Telsy, Telespazio, TOP-IX Consortium, Politecnico di Milano, University of L'Aquila, La Sapienza University, University of Naples Federico II, University of Padua, University of Trieste. In particular, QUID aims to expand the existing fibre optic and satellite communication infrastructures and extend the quantum communication network to the north-east of Italy.

## ESPI signs MoU with the Korea Aerospace Research Institute (KARI)

During a visit of representatives of the Permanent Mission of the Republic of Korea in Vienna and the Korea Aerospace Research Institute (KARI) on June 1<sup>st</sup> at the European Space Policy Institute (ESPI) in Vienna, ESPI and KARI signed a MoU. The signing ceremony was also attended by ESPI's founding member, the Austrian Research Promotion Agency FFG and the Austrian Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation & Technologie. Through the MoU, KARI strives to become more involved in the policy developments of space activities, while ESPI aims to increase its global reach and engagement and strengthen relations to South Korea.



*Credit: ESPI*





### In other news

**Ian Annett will step down from his role as Deputy CEO of the UK Space Agency:** After more than 3.5 years, he will leave this role by the end of August. The recruitment process for his successor will start soon.

**The Galileo Second Generation enters the full development phase:** The system is now ready for its In Orbit Validation development phase. The contracts for building the 12 satellites were awarded in May 2021 to Thales Alenia Space and Airbus Defence & Space and contracts for developing the ultra-precise atomic clocks carried onboard the satellites were awarded to Safran Electronics & Defence and Leonardo.

**12th U.S.-EU Space Dialogue took place in Brussels:** the delegations discussed current and future cooperation on space activities including global navigation satellite systems, Earth observation activities, security concerns, space cybersecurity and space situational awareness, long-term sustainability and spaceflight safety coordination.

**Saudi Space Commission will transform into the Saudi Space Agency:** The Saudi Cabinet approved this decision during the weekly Cabinet session on June 13rd. The transformation and the status of a space agency is expected to boost the space sector.

**ESPI launched the “Vienna Space Diplomat” (VSD) initiative:** the platform aims to further ESPI’s mission of promoting space policy debate through a set of events and activities for diplomats and foreign policy practitioners and will include three types of complementary activities: (1) UN COPUOS side events, (2) VSD Forum, (3) VSD annual reception.

**ESA launches project to demonstrate AI using satellite data for organic cotton supplies monitoring:** the project aims to train AI software from the German company Marple using ESA satellites’ data to detect cotton fields and classify farms’ cultivation methods – with the overall goal to support certifying organic cotton farms in India for crime prevention. The project is conducted in partnership with the organisation Global Organic Textile Standard (GOTS).

**Rwanda Space Agency and Japan International Cooperation Agency strengthen space cooperation:** The partnership is expected to advance objective to use space for the inclusive socio-economic development of Rwanda.



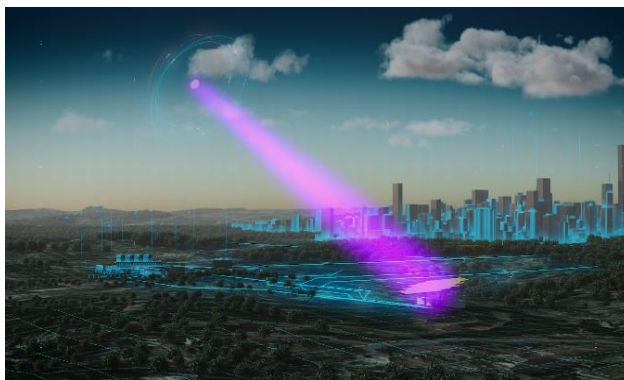
## INDUSTRY & BUSINESS

### Latest advancements in Space-Based Solar Power (SBSP)

According to several reports, SBSP has the potential to yield [eight times more power](#) than solar panels located on Earth's surface, as it provides a way to tap into the unlimited supply of solar energy in outer space, where the energy is constantly available without being subject to the cycles of day and night, seasons, and cloud cover.

#### California Institute of Technology (Caltech) demonstrates first time ever SBSP transmission

Researchers at Caltech engaged in the Space Solar Power Project (SSPP) recently completed the first successful wireless power transfer using the [Microwave Array for Power-transfer Low-orbit Experiment \(MAPLE\)](#). MAPLE is one of three key technologies tested by the Space Solar Power Demonstrator (SSPD-1). The platform consists of an array of flexible, lightweight microwave transmitters controlled by custom electronic chips. In addition, the SSPD-1 carries the Deployable on-Orbit ultralight Composite Experiment (DOLCE), a 1.8 x 1.8-meter structure designed to deploy small modular spacecrafts, and ALBA, a series of 32 different types of photovoltaic cells to test which are most effective in outer space.



*Credit: ESA*

The [SSPD-1 launched on January 3rd atop a SpaceX Falcon 9](#) as part of a rideshare program and was deployed by a Momentus' Vigoride spacecraft. So far, the project has raised more than \$112M from investors including Donald Bren Foundation and Northrop Grumman.

#### Orbital Composites, Virtus Solis Team on Space-Based Solar Power Station

US-based startups Orbital Composites and Virtus Solis announced the signing of a MoU for the [commercialisation of the world's first space-based solar power station](#). The two companies will combine their expertise, namely 3D printing of SBSP platforms and wireless power transmission (WPT) technologies and plan a first on-orbit test of 100+ satellites in 2026.

#### The UK wants to harvest Space-Based Solar Power

UK Energy Security Secretary Grant Shapps awarded a [£4.3M \(€5M\) government funding to develop Made in UK SBSP technologies](#). The early-stage development fund includes £3.3M (€3.8M) from the Department for Energy Security and Net Zero and £1M (€1.2M) from the UK Space Agency. The winning projects include Cambridge University, who will develop ultra-lightweight solar panels for satellites that can function in the high-radiation conditions of space, and Queen Mary University in London, who are working on a wireless system to enable the solar power collected in space to be transferred to Earth. Other winners include MicroLink Devices UK, University of Bristol, Satellite Applications catapult, Imperial College London, EDF Energy R&D UK Centre.



### Industry actively shaping the future of European launch capabilities



*Credit: CSG*

Although the retirement of Ariane 5 leaves Europe without any autonomous heavy payload capacity for at least a few months, Europe's brand new launch vehicle [Ariane 6 was unveiled on its launch pad in Kourou](#), in preparation for hot-firing tests of the core stage Vulcain 2.1 engine. However, according to reports the long-awaited rocket is [unlikely to fly before the end of 2023](#).

[Arianespace signed 3 MoUs](#) with launch service providers, the France-based Dark, the Scottish Orbex, and the Spanish PLD Space, to lay the foundation for flexible joint offers to their clients, including the possibility of back-ups,

and increase the commercial capacity of access to space. In addition, Thales Alenia Space Spain signed a contract with ArianeGroup to produce telemetry transmitters for the Ariane 6 launch vehicle enabling post-launch analysis of all flight data, as well as the rocket's nozzle steering system. The initial contract will cover the first 15 launchers in a 30 years-programme, with delivery of 30 transmitters by the fall of 2025 to prepare for the ramp-up in operations. Ultimately, a contract to produce the launcher's fairing system was awarded to Beyond Gravity.

Moreover, CNES and the German launch startup Rocket Factory Augsburg (RFA) [signed a binding term sheet which enables RFA access to a new commercial launch facility at the Guiana Space Center](#) in French Guiana for the launch of the RFA ONE microlauncher in 2025.

### OneWeb initiates commercial services in Europe and U.S. and boosts in-flight and maritime connectivity

OneWeb started offering services in [37 new countries in Europe and on the West Coast of the U.S.](#) As the global on-board connectivity market is experiencing a steep growth, with the [market expected to reach \\$32.4B by 2026 and a CAGR of 14.5%](#), an increasing number of airlines and maritime operators are looking for low-latency broadband mobility services for their customers.

In June, Hughes Network Systems and OneWeb signed a Distribution Partner agreement to provide LEO connectivity services to the global airline market. Hughes electronically steered antenna will be coupled with OneWeb's LEO services for airlines to deliver fast, low-latency and reliable passenger Wi-Fi. Furthermore, [OneWeb has launched its "Try Before You Buy" maritime connectivity service](#). Following a recent agreement, Texas-based communication services provider [Speedcast has installed OneWeb's maritime terminals on the RV Polarstern](#) and will be able to provide global LEO-based L-band services to maritime communities.

### NASA partners with seven U.S. companies to advance space capabilities

NASA selected Blue Origin, Northrop Grumman, Sierra Space, Space Exploration Technologies Cooperation, Special Aerospace Services, ThinkOrbital, and Vast Space LLC [to partner through unfunded Space Act Agreements as part of the second Collaborations for Commercial Space Capabilities-2 initiative \(CCSC-2\)](#) to advance space capabilities and to meet future commercial and government needs, progress in human spaceflight and boost the U.S. commercial LEO economy.



### U.S. Space Force awards Palantir extension contract for data-as-a-service

Colorado-based [Palantir Technologies](#) won [\\$110.3M in contract extensions](#) to provide the Space Force with cloud-based data services, using the company's Warp Core Data as a Service (DaaS) platform for data ingestion, retention, processing, normalisation, analysis, and visualisation across the global space enterprise. \$58.4M has been allocated for automatic data ingestion across the Air Force, aiming to integrate personnel, equipment, planning, health, and readiness data sources into a centralised foundation. An additional \$32.7M will be used for commercial software licenses to support Space Command and Control (C2) and enable ingestion of Special Access Program data. \$19.2M has been earmarked for data services to enhance joint all-domain command and control capabilities of the North American Aerospace Defense Command and the U.S. Northern Command. Interestingly the Space Systems Command (SSC), in charge of acquiring and fielding military space capabilities, designated [\\$900M for data software services and selected 18 service providers](#) under Indefinite Delivery/Indefinite Quantity (IDIQ) contracts.

### Northrop Grumman gets \$80.3M contract for satellite communication

Northrop Grumman has been awarded a four-year, [\\$80.3M contract by the U.S. Air Force Research Laboratory \(AFRL\)](#) to conduct communications experiments using multiple commercial space internet services. This contract falls under the Defense Experimentation Using Commercial Space Internet (DEUCSI) programme, which aims to integrate commercial space internet services with military platforms and weapon systems.

### Serco to lead EU Commission flagship initiative DestinE

The [Serco](#) received a contract by ESA to set up and operate the EU Commission flagship initiative DestinE Earth (DestinE)'s Core Service Platform (DESP) cloud infrastructure. The project aims to create a digital model of planet Earth to provide critical support in anticipating extreme events and support the adaptation of policies tackling climate-change. DESP will provide evidence-based decision-making tools, applications, and services from a broad set of data, including ESA's Earth Explorers, the Copernicus Sentinel series, the European Centre for Medium-range Weather Forecasts (ECMWF) data, and other major data holdings in Europe. [Serco](#) is partnering with [Thales Alenia Space](#), [CGI](#), [Deimos](#), [Exprivia](#), [MEEO](#), and [Alia Space](#).



*Credit: Serco*

### New Space European companies jump-start the EU Copernicus Programme

On the occasion of the Le Bourget Paris Air Show, [ESA and the European Commission welcomed 9 new companies to reinforce the Copernicus Programme](#) as "Contributing Missions" that are adding up to the already 20 privately-owned satellite missions that contribute to Copernicus. The multi-million contracts awardees include the Finnish Kuva Space Oy, the Bulgarian EnduroSat, the French Prométhée and Absolut Sensing, the Belgian AerospaceLab, the German constellr and OroraTech, and the Spanish Aistech and Satlantis. The awards are part of a new EU procurement method called the [Dynamic Purchasing System \(DPS\)](#) to support European companies, moving towards a fully digital hybrid model for Copernicus with both EU-owned Sentinel satellites and private constellations.





### GMV will provide the Ground Control System for the Galileo Second Generation

Aviation and aerospace component manufacturer [GMV](#) has secured over €200M in an [ESA contract](#) for the development of the ground station responsible for the in-orbit control and validation of the Galileo Second Generation (G2G). The contract includes core G2G activities worth €155M to be spent over a 42-month period until the end of 2026, with options for extension until 2028. 12 G2G satellites are scheduled for tentative launch within the upcoming three years, while the prospective activation of the new ground control system is expected in 2025, coinciding with the deployment of the initial satellite from this subsequent iteration.

### Thales to protect Eurodrone's secure communications against jamming

[Thales](#) has joined [Airbus](#), [Dassault](#), [Safran](#), and [Leonardo](#) in the [Eurodrone consortium](#), a four-nation European consortium under the Organisation for Joint Armament Co-operation (OCCAR), involving Germany, France, Spain, and Italy. The MALE-class (Medium Altitude Long Range) remotely piloted aircraft aims to develop an unmanned aerial system for operation in a non-segregated airspace, has an estimated cost of €7B and will be equipped with Thales' Modem 21, a modem designed to protect secure high-speed and multi waveform satellite communications from jamming interferences.

### Cislune Excavators secures 4 NASA contracts to develop lunar infrastructures

Defence and space manufacturing company [Cislune](#) has been awarded four [NASA contracts](#) each worth \$150K to extract water from the permanently shadowed craters on the lunar surface and, via electrolysis, turning that water into propellants. The ultimate objective is to enable missions to take off directly to and from the Moon without needing to backtrack to Earth and therefore drastically reduce the cost of lunar landing travel. Two Small Business Innovation Research (SBIR) grants focus on minimising loss of lunar ice during excavations and strengthening power production by reducing energy inputs. The remaining two Small Business Technology Transfer (STTR) grants envisage the development of systems to make sure lunar rovers move promptly and autonomously, and to improve vehicle launch pad infrastructures.



*NASA/GSFC/Arizona State University*

### Westinghouse and Astrobotic partner to develop nuclear space technologies



*Credit: NASA*

Westinghouse Electric Company and Astrobotic have entered into a Memorandum of Understanding (MoU) to explore collaboration in space technology programmes for NASA and the DoD. Their joint efforts will focus on the development of space nuclear technology, delivery systems, and strengthening the space nuclear supply chain and workforce in the U.S.

Westinghouse, having previously secured a NASA/DOE contract, is currently working on a scaled-down version of the 5-MWe eVinci™ microreactor, which aims to power spacecraft in orbit or on planetary surfaces like the Moon or Mars, providing continuous power for space research and other applications. Additionally, Astrobotic, known for its lunar lander and rover expertise, is developing LunaGrid, a commercial power service specifically designed for the lunar south pole.



## SES U.S. wins 5-year \$134M U.S. DoD contract

SES' U.S. subsidiary won a five-year DoD contract worth \$134M. Within this "global X-band blanket purchase agreement", SES will deliver X-band satellite communications provided by the GovSat-1 satellite, owned by the Luxembourgish joint venture LuxGovSat (SES and the Luxembourg government).

### In other news

**Entrepreneur Greg Wyler wants to register 116.640 C-band satellites through the French National Frequencies Agency (ANFR):** The upcoming Semaphore-C constellation is being designed by E-Space, which is operating its European HQ in Toulouse, where it also intends to concentrate its operations and build its manufacturing capabilities.

**Virgin Galactic among the pioneers of space tourism:** The first commercial SpaceShipTwo suborbital flight hosted the Virtude 1 mission, with three Italian Air Force officials conducting 13 biomedical, microgravity, and mechanical experiments onboard.

**D-Orbit awarded €26M under Italy's National Recovery and Resilience Plan (PNRR):** The Italy-based space tug manufacturer will provide one SAR satellite and manage its flight operations segment on behalf of the end user, with an option for an additional SAR satellite worth €24M.

**ClearSpace concludes pivotal milestone in the UKSA-led CLEAR mission:** The Company concluded the System Requirements Review which evaluated technical requirements and conducted examination of the satellite's functionality, design, and operability. It will be followed by a Preliminary Design Review at the end of 2023.

**CNES and Dark partner for emergency Space Debris Interceptor simulation:** The Interceptor will utilize Salazar, a framework developed by Dark that fully simulates the overall process and behavior of a spacecraft across various scenarios and mission types. CNES has selected a rocket body from a list of 50 objects that have been identified as needing to be urgently removed from orbit.

**Viasat awarded \$10M by Air Force Research Laboratory (AFRL):** The Californian company will provide the AFRL a Viasat-3 terminal onboard a LEO spacecraft that will demonstrate LEO-to-GEO communications.

**Greek Planetek Hellas awarded €1M ESA contract:** The company is tasked with the design, assembly, integration, testing, launch, and operation of a CubeSat equipped with in-orbit laser terminal, on-board clouds classification, AI & Machine Learning (AI/ML).

**Vega-C to launch KARI Kompsat-6 in 2024:** The KOREan Multi-Purpose SATellite-6 will replace Kompsat-5 and will feature imaging radar performance, it will carry two payloads, the SAR instrument (X-Band Synthetic Aperture Radar), and the S-AIS (Satellite-Automatic Identification System).

**Success Rockets to fly first private Russian suborbital rocket in fall:** According to earlier reports, the carrier rocket will measure 5.17 meters in length and 0.45 meters in diameter and weigh 253 kg.



## INVESTMENT & FINANCE

### Intelsat and SES end merger talks

On June 21st, Intelsat has terminated discussions regarding a potential merger with rival satellite operator SES. The two companies had been engaged in negotiations for approximately three months, aiming to create a combined entity with revenues amounting to around \$4 billion. The proposed merger was also seen as a move in response to the expansion of SpaceX's Starlink broadband constellation, which poses a challenge to their satellite broadband markets, but is also in line with expected market consolidation. This potential transaction would have followed Viasat's merger with Inmarsat, as well as the combination between Eutelsat and OneWeb. However, SES and Intelsat were unable to reach an agreement regarding their potential merger. The operators have disagreements concerning the allocation of the substantial proceeds from the clearing of C-band spectrum, amounting to billions of dollars.



*Credit: SES*

### \$87M raised by Tomorrow.io in Series E funding round



*Credit: Tomorrow.io*

Tomorrow.io, a platform specialising in weather intelligence and climate security, has revealed the completion its Series E funding round, amounting to \$87M on June 14th. The funding was led by Activate Capital and will be utilised to expedite the deployment of Tomorrow.io's constellation of 20 satellites within the next 18-24 months. Notable participants in the funding round include RTX Ventures, Seraphim, Chemonics, SquarePeg Capital, Canaan, ClearVision, JetBlue Ventures, and Pitango Growth. The US-based company made the announcement on June 14,

shortly after successfully launching its second satellite, R-2, aboard the SpaceX Transporter-8 rideshare flight. Once the constellation of 20 satellites, including R1 and R2, is fully deployed, Tomorrow.io will have the capability to offer near real-time scans of global weather patterns, providing valuable insights into Earth's atmospheric conditions.

### Pixxel closes \$36M Series B funding round led by Google

Pixxel, a startup specialising in hyperspectral imaging, announced the completion of their Series B funding round on June 1st, raising \$36M. This round was led by Google (through Google's India Digitalisation Fund) and accompanied by existing investors Radical Ventures, Lightspeed, Blume Ventures, growx, Sparta, and Athera. The primary focus of the US and India based company lies in the development of a constellation of hyperspectral imaging satellites. Having successfully launched their initial pathfinder satellites in 2022, the company aims to deploy a full constellation comprising 24 satellites by 2025. The newly secured funds will be utilised for the advancement of this satellite network, as well as the creation of an analytics platform named Aurora.



### Nelco invests \$122M in router maker in wake of threat of foreign competition



*Credit: Nelco*

On June 9th, Indian satellite communications provider [Nelco](#), has made a significant investment of approximately \$122M in [Piscis Networks](#), a Mumbai-based start-up specialising in network equipment. In an official filing with the stock exchange, Nelco revealed its acquisition of an initial stake of slightly over 9% in Piscis Networks, with the possibility of increasing its stake to 30% in the future. Piscis Networks is renowned for its expertise in network management technology called software-defined

networking in a wide area network (SD-WAN). This move was made to enhance Nelco's performance, security, and reliability of its communications services amidst growing competition from international players. In April, India unveiled a policy long-awaited by foreign operators like SpaceX, OneWeb, Telesat, and SES, that outlines clearer regulations for operating in the country.

### Space computer system startup receives \$26M

On June 28th, [Ramon.Space](#), announced the successful completion of its \$26M Series B funding round. The Israeli company which specialises in computing infrastructure for space applications, secured funding from Ingrasys, a subsidiary of Foxconn Technology Group, the largest manufacturer of server and storage platforms globally, and the Strategic Development Fund (SDF), an investment firm based in Abu Dhabi. Existing investors, including Grove Ventures, Deep Insight, and UMC Capital, also participated in this funding round. The investment from Ingrasys follows a recently disclosed strategic agreement to manufacture Ramon.Space's computing products on a global scale. With this newly acquired funding, Ramon.Space will expand its organisation, advance the commercialisation of its space-resilient computing platform, explore new markets, and strengthen its global presence in response to the growing demand for computing solutions in space. Ramon.Space has developed and deployed software-based computing technology, capable of storing, processing, and analysing vast amounts of data in space.



*Credit: Ramon.space*

### IrriWatch acquired by Hydrosat

On June 8th, US-based climate tech company [Hydrosat](#) announced the acquisition of [IrriWatch](#), a software company specialising in irrigation management, based in the Netherlands. By integrating IrriWatch's software with Hydrosat's crop classification and yield forecasting capabilities, the company will be able to provide solutions to the agriculture sector. This acquisition follows Hydrosat's successful Series A funding round, raising \$20M in April of this year. While the company currently relies on open-source Earth observation datasets for product development, they are actively working on launching their own 16-satellite constellation to deliver constant high-resolution thermal images. The upcoming launches of VanZyl-1 and VanZyl-2, Hydrosat's initial fully operational commercial satellite missions, are scheduled for 2024.





### Firefly buys Spaceflight Inc.

Firefly Aerospace, a rocket startup based in the U.S., made an announcement on June 09th regarding its acquisition of Spaceflight Inc., which is specialising in space services and transportation. This strategic move by Firefly. Spaceflight Inc. specialises in coordinating launch rideshares, having accomplished more than 460 successful payload deployments. Additionally, it operates orbital transfer vehicles that can facilitate last-mile satellite deliveries. By acquiring Spaceflight Inc., Firefly aims to enhance its on-orbit service capabilities by gaining access to valuable mission management expertise, while also expanding its product suite to offer comprehensive end-to-end services for satellite customers. The specific details regarding the terms of the deal were not disclosed by Firefly.

### Look Up Space secures second largest seed funding for space in Europe

French start-up Look Up Space had the **second-largest seed round with €14M in Europe** for a Space Tech and the largest to date in France. €7M were raised by private investors in a round led by CosmiCapital and MIG Capital, with support from Geodesic Expansion and several other private investors. The remaining €7M are tied to the France 2030 national investment plan and the French Tech Seed fund.



*Credit: Look up space*

The fresh money will enable the company to develop its “SORASYS” space surveillance radar demonstrator and its “SYNAPSE” multi-source data fusion and processing platform by the end of 2024. Look Up Space is in the process of creating a comprehensive global solution that utilises a network of radars spread across the world, combined with a platform capable of merging and analysing data from multiple sources. This solution aims to establish continuous, real-time, dependable, and highly accurate surveillance capabilities. The company’s objective is to offer space security data and services to a wide range of customers, including institutional and private entities.

### Germany-based Vyoma raises €8.5M

German SSA and STM startup Vyoma has successfully raised €8.5M in Seed funding. This funding round, initiated during the summer of 2022, was completed with an extended tranche that included participation from Safran Corporate Ventures. The Seed round was led by Happiness Capital and Atlantic Labs, with additional support from Faber Ventures. The secured funds will be utilised by Vyoma to bolster their team, expand their customer base, and strengthen their position in the market.



*Credit: Vyoma*

Moreover, Vyoma will collaborate with various branches of Safran to further advance its own sensor technologies. Vyoma plans to launch space-based sensors for monitoring space debris and satellites in different orbits.



### Australian projects receive grants within NASA Moon to Mars Initiative

On June 28th, the Moon to Mars Initiative's Demonstrator Program has unveiled the ten Australian grant recipients, collectively receiving close to \$40M in support. The program aims to assist SMEs in launching their space products by providing grants of up to \$10M per project. The top 3 grants awarded were:

- Laser Technology for the next GRACE mission (\$6.21M): This collaborative effort between industry and academia focuses on developing laser stabilisation flight technology for upcoming gravity sensing missions. Building upon the collaboration for the Gravity Recovery and Climate Experiment (GRACE) Follow-On mission, this project aims to advance space flight technology for future GRACE missions.
- Project LUNA – Navigation and Guidance Technology for Lunar Exploration (\$5.27M): Project LUNA, which stands for Laser measurement Unit for Navigational Aid, aims to demonstrate the capabilities and performance of Australian LiDAV technology.
- Australian Deep Space Optical Ground Station Network (\$4.50M): Led by the Australian National University (ANU) consortium, this project aims to establish the first Australian deep space communication-capable optical ground station. The ANU optical ground station (OGS) will be upgraded to align with NASA's Optical to Orion (O2O) mission requirements.

### Singapore-based Zero-Error closes \$7.5M Series A funding round

Zero-Error Systems, a startup based in Singapore that specialises in the development of radiation-hardened integrated circuits, has successfully raised \$7.5M in a Series A investment round, the company announced on June 12th. Investors include Airbus Ventures and Dart Enterprises. The infusion of \$7.5M will be used to expand the company's business presence in the United States and Europe, to further enhance their product line and to encourage private space companies to adopt their technology. While many space companies currently utilise automotive or consumer-grade integrated chips and rely on shielding to mitigate radiation effects, these measures only provide limited protection against single event effects. Zero-Error Systems aims to address this limitation by offering radiation-hardened integrated circuits.

### Ocean nonprofit receives \$60M to map fishing activities and sea infrastructure

Global Fishing Watch, an ocean conservation nonprofit, announced on June 7th that it has been granted a commitment of \$60M over a period of five years through The Audacious Project. During this timeframe, Global Fishing Watch plans to create public maps encompassing over one million ocean-going vessels as well as all fixed infrastructure at sea. Through the open ocean project, Global Fishing Watch intends to combine GPS data with vast amounts of satellite imagery and utilise machine learning techniques to publicly display the movements and operations of all industrial fishing vessels, hundreds of thousands of small-scale fishing boats, and cargo ships. Additionally, the project aims to map stationary infrastructure at sea, including aquaculture pens, wind farms, and oil rigs, thereby offering a unique online perspective of our impact on the world's oceans. The Audacious Project selects a group of projects annually that propose innovative solutions to critical global challenges.



### In other news

**U.S.-based Nuview secures a total of \$15M in funding:** The startup plans to map the entire Earth's landmass annually using space-based light detection and ranging (lidar) technology. The investment was led by MaC Venture Capital, with participation from Broom Ventures, Cortado, Florida Funders, Industrious, Liquid2, and Veto Capital.

**Eutelsat is selling its European retail broadband activities:** This involves assets that were acquired approximately three years ago from Bigblu Broadband. This sale covers retail operations in various European countries. Eutelsat's concise statement did not provide information about the purchaser or specific financial particulars.

**Atmos Space Cargo secures €4M in Seed funding:** This involved notable investors such as High-Tech Gründerfonds, the Amadeus APEX Technology Fund, Seraphim, E2MC, Ventis, and another.vc. the Germany-based company is developing capsules for returning cargo from space and will use newly acquired funds, for its inaugural demonstration flight in 2024.

**Apex secures \$16M in Series A funding:** The round was spearheaded by Andreessen Horowitz and Shield Capital. The US-based company will use the towards the establishment of its inaugural factory for large-scale satellite buses.

**Satellite manufacturing company York Space Systems acquires Emergent Space Technologies:** This provides York with access to proprietary flight and ground software products created by Emergent Space Technologies through government contracts with U.S. defense agencies, the intelligence community, and NASA. The specific financial details of the acquisition were not disclosed.

**Fortify raises funding of \$12.5M:** The additive manufacturing company, which produces components for applications such as satellites and cell towers, is funded by prominent investors, including Lockheed Martin Ventures and RTX Ventures. US-based Fortify intends to leverage the additional funding to expedite the advancement of its Digital Composite Manufacturing platform.

**IceMOS Technology receives a portion of a £300K funding from the UKSA for a project focused on the development of SiC power transistors for space applications:** This was supported by UK space and defence trade association ADS, through the Space Technology Exploitation Programme (STEP).

**Digantara raises \$10M funding in a Series A round:** The India-based SSA startup is developing its Space-MAP project to collect and analyse SSA data. The recent round was led by Peak XV Partners and former investors such as Kalaari Capital. The new funding will be used to smallsats equipped with electro-optical sensors for data collection.

**SpaceFounders and Beyond Gravity announced closer cooperation to help space start-ups:** Both companies have entered into an agreement that enhances the linkage and fosters active exchange between the distinct modules of their respective multi-week training programs for start-ups.

**GMV acquires Spain-based Alén Space:** the private equity firm acquires the nanosatellite mission provider through a majority stake in the company in combination with a share capital increase.



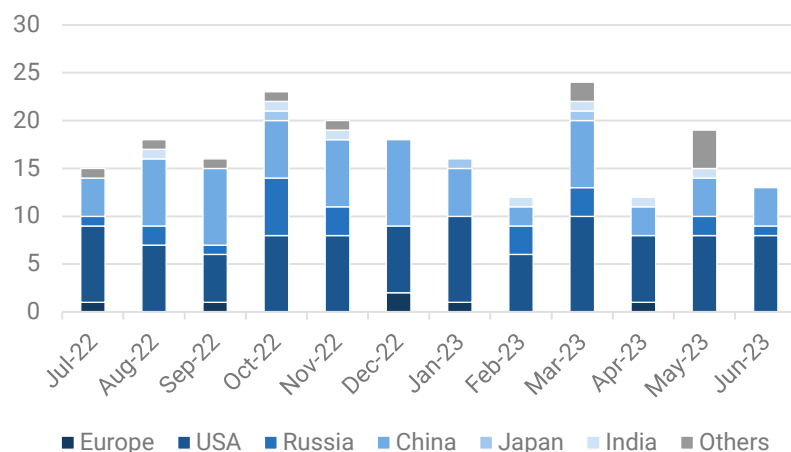
# LAUNCHES & SATELLITES

Detailed information was not available for several of this month's launches, therefore the data below reflects the ESPI's assessment based on the available data. The database will be updated as soon as more information is made public.

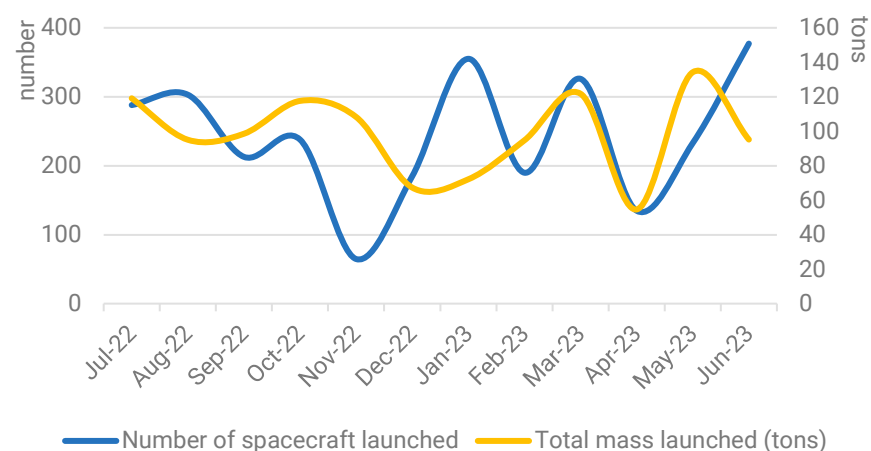
## Global space activity statistics

June 2023	USA	Russia	China	Total
Number of launches	8	1	4	<b>13</b>
Number of spacecraft launched	259	49	69	<b>377</b>
Mass launched (in kg)	87 917.95	4111.2	3209	<b>95 238.15</b>

## Launch activity over the year



Evolution of the number of launches per launch country

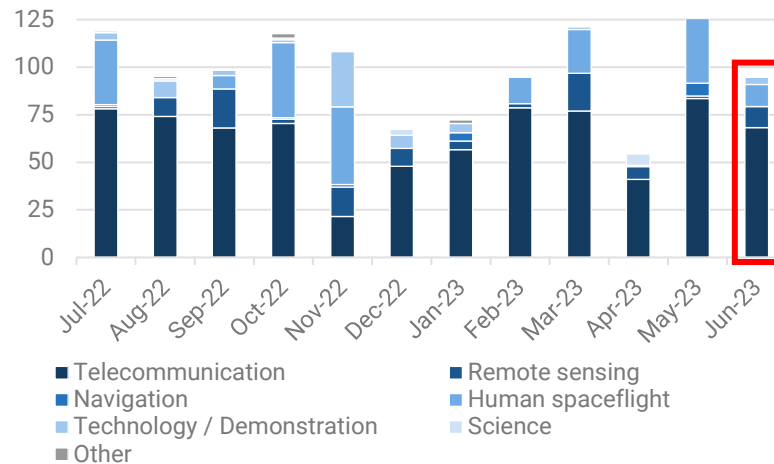


Evolution of launch activity over the year 2022-2023

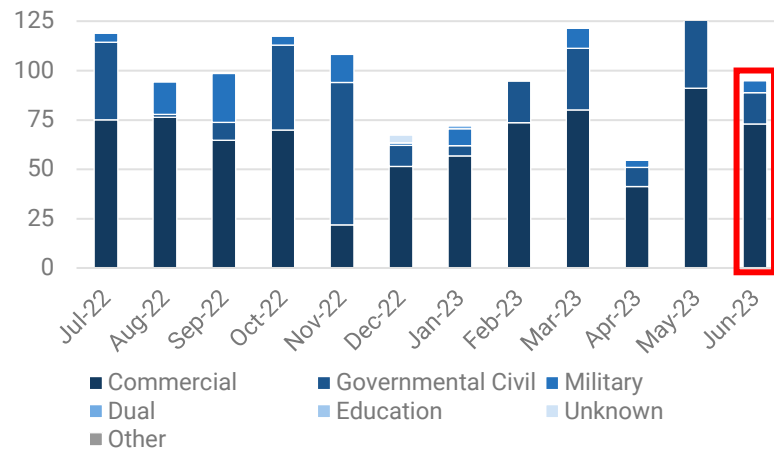




## Satellite missions and markets



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



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

June 2023	Telecom	Remote sensing	Navigation	Human Spaceflight	Tech/ Dem	Science	Other
Europe	20	482			139.5		104.5
USA	63 332.8	5449		11600	1241	21.2	200
Russia	8.4	2763	42.5		1122.4	65.9	81
China		1934			1275		
India		80					
Japan		100					
Others	4910	238			35,6		
Unknown		7			7		

Total mass (kg) launched by mission and customer country

June 2023	Commercial	Gov. Civil	Military	Dual	Education	Amateur	Unknown
Europe	733.5	11			0.85	0.2	
USA	64 172.8	11 605	6043		2		
Russia	1115	2840.5			127.7		
China	1784	1320					105
India				80			
Japan	100						
Unknown	14						
Others	5149.35	15			19.25		

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
04/06/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (22 spacecraft)	SpaceX	USA	SpaceX	USA	800 (each)	Telecom	Commercial
05/06/2023	USA	Falcon-9 v1.2 (Block 5)	Dragon CRS-28	NASA	USA	SpaceX	USA	11000	Cargo Transfer	Gov. Civil
			ESSENCE	York University	Canada	York University	Canada	4	Tech/Demo	Education
			Iris (Canada)	University of Manitoba	Canada	University of Manitoba	Canada	4	Tech/Demo	Education
			iROSA 3A	NASA	USA	Redwire	USA	600	Space Station Infrastructure	Gov. Civil
			Moonlighter	The Aerospace Corporation	USA	The Aerospace Corporation	USA	5	Tech/Demo	Gov. Civil
			RADSAT-SK	University of Saskatchewan	Canada	University of Saskatchewan	Canada	2	Tech/Demo	Education
			SC-ODIN	Concordia University	Canada	Concordia University	Canada	4	Tech/Demo	Education
			Ukpik 1	University of Western Ontario	Canada	University of Western Ontario	Canada	2	Tech/Demo	Education
07/06/2023	China	Zhongke-1A	CXPD	Guangxi University	China	Guangxi University	China	5	Tech/Demo	Unknown
			Fucheng 1	Unknown (China, Public)	China	Spacety Co.	China	300	Earth Observation	Gov. Civil
			Shiyan 24A & 24B	Unknown (China, Public)	China	CAS	China	200 (each)	Tech/Demo	Gov. Civil
			Tianyi 26	Spacety Co.	China	Spacety Co.	China	8	Earth Observation	Commercial
			Unknown (20 spacecraft)	Unknown	China	Unknown	China	5 (each)	Tech/Demo	Unknown
			Xi'an Hangtuo 8	Xi'an Aerospace	China	Xi'an Aerospace	China	100	Tech/Demo	Commercial
09/06/2023	China	Kuaizhou-1A	Longjiang 3	CAST	China	Harbin Institute of Technology	China	120	Tech/Demo	Gov. Civil
12/06/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (52 satellites)	SpaceX	USA	SpaceX	USA	295 (each)	Telecom	Commercial
12/06/2023	USA	Falcon-9 v1.2 (Block 5)	ABA First Runner	Azista	India	Azista	India	80	Earth Observation	Dual
			All-Delta	Aurora Insight	USA	SpaceQuest	USA	10	Tech/Demo	Commercial
			Ayris 1 & 2	Unknown	Unknown	NanoAvionics	Lithuania	7 (each)	Signal Intelligence	Commercial
			Blackjack Aces (4 spacecraft)	DARPA	USA	Blue Canyon Technologies	USA	200 (each)	Tech/Demo	Military
			DROID 001	Turion Space	USA	NanoAvionics	Lithuania	35	Tech/Demo	Commercial
			EIVE	IRS	Germany	IRS	Germany	10	Tech/Demo	Commercial



## Launches & Satellites

ELO-4	Eutelsat	France	ÅAC Clyde Space	Sweden	10	Telecom	Commercial
EPICHyper 2	ÅAC Clyde Space	Sweden	ÅAC Clyde Space	Sweden	8	Earth Observation	Commercial
Forest-2 / Orora	Orora Technologies	Germany	Spire	USA	4	Earth Observation	Commercial
FOSSASat FEROX (4 spacecraft)	Fossa Systems	Spain	Fossa Systems	Spain	2 (each)	Tech/Demo	Gov. Civil
GEI-SAT Precursor	Satlantis	Spain	NanoAvionics	Lithuania	21	Tech/Demo	Commercial
GHOST 3	Orbital Sidekick	USA	Astro Digital	USA	85	Earth Observation	Commercial
Grégoire	Aerospacelab	Belgium	Aerospacelab	Belgium	100	Tech/Demo	Commercial
HADES B	AMSAT-EA	Spain	AMSAT-EA	Spain	0,2	Radio Amateur	Amateur
HotSat-1	Satellite Vu	United Kingdom	SSTL	United Kingdom	130	Earth Observation	Commercial
ICEYE (4 spacecraft)	ICEYE	Finland	ICEYE	Finland	85 (each)	Earth Observation	Commercial
ION-SCV 11	D-Orbit	Italy	D-Orbit	Italy	100	Other	Commercial
Istanbul	Hello Space	Turkey	Hello Space	Turkey	0,25	Tech/Demo	Commercial
Kelpie 2	Orbcomm	USA	ÅAC Clyde Space	Sweden	3	Telecom	Commercial
Lemur-2 166 & 167	Spire	USA	Spire	USA	4 (each)	Earth Observation	Commercial
MDQSAT 1C & 1D	Innova Space	Argentina	Innova Space	Argentina	0,55 (each)	Tech/Demo	Commercial
MISR-A1 & B1	US Special Operations Command	USA	Unknown (USA, Private)	USA	10 (each)	Tech/Demo	Military
MRC-100	Budapest University of Technology and Economics	Hungary	Budapest University of Technology and Economics	Hungary	0,6	Radio Amateur	Education
MuSat-1	Muon Space	USA	Muon Space	USA	70	Earth Observation	Commercial
ÑuSat (4 spacecraft)	Satellogic SA	Uruguay	Satellogic SA	Uruguay	38 (each)	Earth Observation	Commercial
Orbiter SN3	Launcher	USA	Launcher	USA	200	Other	Commercial
Otter Pup	Starfish Space	USA	Astro Digital	USA	40	Tech/Demo	Commercial
Outpost Mission 0	Outpost	USA	Outpost	USA	6	Tech/Demo	Commercial
Pleiades-Squared	Cal Poly Pomona	USA	Cal Poly Pomona	USA	2	Tech/Demo	Education
QPS-SAR 6	iQPS	Japan	iQPS	Japan	100	Earth Observation	Commercial
ROM 2	RomSpace	Romania	RomSpace	Romania	0,25	Radio Amateur	Education
Runner 1	ImageSat International	Israel	Tyvak Nano-Satellite Systems	USA	86	Earth Observation	Commercial
SATTLA 2I	Ariel University	Israel	Ariel University	Israel	0,25	Tech/Demo	Education



## Launches & Satellites

			Skycraft Deployer 3	Skykraft	Australia	Skykraft	Australia	80	Telecom	Commercial
			Skykraft (4 spacecraft)	Skykraft	Australia	Skykraft	Australia	55 (each)	Telecom	Commercial
			SpaceBEE (12 spacecraft)	Swarm Technologies	USA	Swarm Technologies	USA	0,4 (each)	Telecom	Commercial
			Spei Satelles	The Holy See	Vatican	Polytechnic University of Turin	Italy	3	Other	Gov. Civil
			Tiger-4	OQ Technology	Luxembourg	NanoAvionics	Lithuania	10	Telecom	Commercial
			Tomorrow R2	Tomorrow.io	USA	Astro Digital	USA	86	Earth Observation	Commercial
			Unicorn 2I	Alba Orbital	UK	Alba Orbital	UK	0,5	Tech/Demo	Commercial
			W-Series 1 / Winnebago 1	Varda	USA	Varda	USA	300	Tech/Demo	Commercial
			XVI / Link-16	ViaSat Inc.	USA	Blue Canyon Technologies	USA	23	Tech/Demo	Military
15/06/2023	China	CZ-2D(2)	Jilin-1 Gaofen-03D (8 spacecraft)	CGST	China	CGST	China	42 (each)	Earth Observation	Commercial
			Jilin-1 Gaofen-06A (30 spacecraft)	CGST	China	CGST	China	42 (each)	Earth Observation	Commercial
			Jilin-1 Pingtai-02A-01 & -02	CGST	China	CGST	China	15 (each)	Earth Observation	Commercial
			Khorgas-1 / Huoerguosi-1	CGST	China	CGST	China	50	Tech/Demo	Commercial
18/06/2023	USA	Falcon-9 v1.2 (Block 5)	Satria /Nusantara 3	Palapa Satelit Nusantara Sejahtera	Indonesia	Thales Alenia Space	France	4600	Telecom	Commercial
20/06/2023	China	CZ-6	Shiyan 25	Unknown (China, Public)	China	DFH Satellite Co.	China	500	Tech/Demo	Gov. Civil
22/06/2023	USA	Delta-4H	Orion 11	NRO	USA	Northrop Grumman	USA	5200	Signal Intelligence	Military
22/06/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (47 spacecraft)	SpaceX	USA	SpaceX	USA	295 (each)	Telecom	Commercial
23/06/2023	USA	Falcon-9 v1.2 (Block 5)	Starlink (56 spacecraft)	SpaceX	USA	SpaceX	USA	295 (each)	Telecom	Commercial
27/06/2023	Russia	Soyuz-2-1b Fregat	Akhmat-1	Southwestern State University	Russia	Chechen State University	Russia	2,5	Navigation	Gov. Civil
			ArcCube 01	Firon Lab	Russia	Firon Lab	Russia	5	Telecom	Education
			A-SEANSAT-PG1	AngkasaX	Malaysia	AngkasaX	Malaysia	10	Telecom	Commercial
			Avion-Kaluga 650	SINP	Russia	NILAKT DOSAAF	Russia	10	Tech/Demo	Gov. Civil
			CSTP-1.1 & 1.2	Spetsialny Tekhnologicheskyy Center	Russia	Spetsialny Tekhnologicheskyy Center	Russia	5 (each)	Tech/Demo	Gov. Civil
			CubeBel 2	Belarusian State University	Belarus	Belarusian State University	Belarus	3	Tech/Demo	Education
			CubeSX-HSE 3	HSE University	Russia	SPUTNIX	Russia	3,4	Telecom	Education



## Launches & Satellites

Impuls 1	MISiS	Russia	MISiS	Russia	10	Space Science	Gov. Civil
Khors 1 & 2	Bauman University	Russia	Bauman University	Russia	10 (each)	Tech/Demo	Gov. Civil
KuzGTU-1	Kuzbass State Technical University	Russia	Kuzbass State Technical University	Russia	4	Tech/Demo	Education
Meteor-M 2-3	Roscosmos	Russia	VNIIEM	Russia	2750	Meteorology	Gov. Civil
Monitor 2, 3 & 4	Moscow State University	Russia	SPUTNIX	Russia	2,8 (each)	Space Science	Education
Nanozond-1	Turgenev Orel State University	Russia	Turgenev Orel State University	Russia	4	Space Science	Gov. Civil
Norbi 2	Novosibirsk State University	Russia	Novosibirsk State University	Russia	10	Space Science	Gov. Civil
PHI-Demo	MBRSC	UAE	MBRSC	UAE	15	Tech/Demo	Gov. Civil
Polytech Universe 3	Peter the Great St. Petersburg Polytechnic University	Russia	Peter the Great St. Petersburg Polytechnic University	Russia	4,5	Earth Science	Education
Rassvet-1 (3 spacecraft)	Buro 1440	Russia	Buro 1440	Russia	350 (each)	Tech/Demo	Commercial
ReshUCube 2	Siberian State University of Science and Technology	Russia	SPUTNIX	Russia	3,4	Tech/Demo	Education
SamSat-ION	Samara State Aerospace University	Russia	Samara State Aerospace University	Russia	4	Earth Science	Gov. Civil
Saturn	KubSTU	Russia	SINP	Russia	10	Space Science	Gov. Civil
Sirius-SINP-3U	BG-Optics	Russia	BG-Optics	Russia		Tech/Demo	Commercial
SITRO-AIS (8 spacecraft)	Sitronics	Russia	SPUTNIX	Russia	5 (each)	Navigation	Commercial
StratoSat TK-1 (6 spacecraft)	Stratonavtika	Russia	Stratonavtika	Russia	1 (each)	Radio Amateur	Education
StratoSatTK 1	Stratonavtika	Russia	Stratonavtika	Russia	75	Radio Amateur	Education
Svyatobor 1	MEPhI	Russia	MEPhI	Russia	5	Earth Observation	Education
UmKA-1	Zabrodin	Russia	Zabrodin	Russia	5	Space Science	Education
UTMN 2	Tyumen State University	Russia	SPUTNIX	Russia	3	Earth Observation	Education
Vizard-meteo	V.I. Churkin	Russia	SPUTNIX	Russia	5	Meteorology	Education
Yarilo 3 & 4	BMSTU	Russia	BMSTU	Russia	5 (each)	Space Science	Gov. Civil
Zorkiy 2M	SPUTNIX	Russia	SPUTNIX	Russia	20	Tech/Demo	Commercial

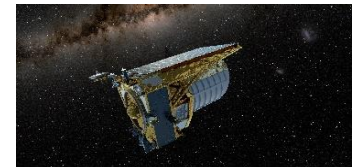




### Launch Highlights

#### ESA's Euclid launched on Falcon 9

The Euclid telescope for ESA was successfully launched on from Cape Canaveral Space on July 1st. The telescope's purpose is to observe the sky and delve into the ancient history of the universe to gain insights into the characteristics and distribution of dark matter and dark energy. The project has incurred a total expenditure of 1.4 billion euros, with 80 different European companies such as Thales Alenia Space, Airbus, Beyond Gravity, and OHB involved. Euclid is anticipated to reach the L2 point approximately four weeks later, after which it will undergo several weeks of system checks. The start of its scientific data collection is scheduled to take place within three months after the launch. Initially, Euclid was intended to launch on a Soyuz rocket from French Guiana, but due to the Russian invasion of Ukraine, ESA made the decision to switch to SpaceX's Falcon 9 launcher. It was chosen because it was the only option to offer the earliest envisioned launch date and the lowest cost without necessitating significant modifications to the telescope.



*Credit: ESA*

#### China crushes national launch record twice



*Credit: Ourspace/CNSA*

On June 15<sup>th</sup>, 41 small satellites were successfully deployed into orbit by a Long March 2D rocket lifted off from Taiyuan Satellite Launch Center, primarily expanding Changguang Satellite's Jilin-1 commercial remote sensing constellation. CGST has set a target of launching over 300 satellites by 2025. This launch surpasses the previous Chinese record of 26 satellites on a single mission, which was achieved only a few days earlier, on June 7<sup>th</sup>, by CAS Space's Lijian 1 rocket. The payloads for the

Lijian 1 launch mostly consisted of undisclosed technology demonstration satellites. The current record for the most satellites deployed in a single mission is 143, set by SpaceX's Transporter-1 rideshare mission in January 2021.

#### Launch of Indonesian SATRIA communications satellite built by TAS

The Indonesian communication satellite, known as SATRIA, lifted off atop SpaceX's Falcon 9 rocket from Cape Canaveral Space Force Station on June 7<sup>th</sup>. The geostationary satellite has been developed to deliver internet service to rural infrastructure with a particular focus on areas lacking terrestrial fibre connections. SATRIA was built by Thales Alenia Space and is based on its advanced Spacebus Neo spacecraft design. The SATRIA project had a total cost of approximately \$550M encompassing expenses related to satellite construction, launch services, insurance, and ground infrastructure. Thales was responsible for building two satellite control centres and telemetry stations as part of their contract.



*Credit: Ourspace/CNSA*

#### New ISS solar arrays launched onboard cargo Dragon

On June 5<sup>th</sup>, a Falcon 9 rocket successfully launched a cargo Dragon spacecraft destined for the ISS. Onboard the spacecraft was the third pair of ISS Roll-Out Solar Arrays (IROSAs). These solar arrays are designed to enhance the station's power generation capability. Installation of the new arrays was conducted during two spacewalks, on June 9<sup>th</sup> and 15<sup>th</sup>. These arrays join the four arrays previously installed during other spacewalks, completing the planned upgrade of the station's power system.

## ABOUT ESPI



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