



## Introduction: space and geopolitics

Space, the ultraterrestrial territory might seem a domain too far away to even bother to look up. The future of geopolitics is being decided outside conventional territory. Space has become a vital infrastructure for the national prosperity of states. Their finance, banking system, Global Positioning System (GPS), climate monitoring, mobile communications and telecommunications in general, all depend on satellites orbiting Earth. There's also the military aspect of outer space. The military benefits from the information provided by satellites such as the Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) system has already been used to wage wars on Earth such as the First Gulf War in 1991.

Space power can be used in three ways: as a means for soft power, for strategic, non-military purposes and for strictly military use. Soft power includes GPS, communications, climate tracking purposes, etc. It could ignite space diplomacy to deal with issues like the debris floating in orbit. The strategic use of space has been in motion since the Cold War. Military use of this extraterrestrial domain has become increasingly important as well. Advanced missile defense missions find outer space an indispensable area to prosper. The US, for example, is building Proliferated Warfighter Space Architecture. These initiatives suggest that the sphere is quickly becoming a new territory for conflict. Naturally, following this trend, there has been an increase in the number of counterspace capabilities globally, especially the anti-satellite missile tests<sup>1</sup>.

Space is a contested and congested place. The information from 2024 suggests that there were 8,261 satellites of which 1.809 belonged to NATO allies in 2021<sup>2</sup>. Space is now more accessible than ever: small satellites are being created and used by the military, commercial operators and even regular citizens. The purposes are multiple: communications, intelligence information gathering, environmental tracking, etc., as mentioned. These satellites could eventually be used as weapons themselves. They are ideal instruments because they are cheap, easy to launch and difficult to track. Without

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<sup>1</sup> Expressions by Montaigne and Victoria Samson, "The Geopolitics of a New Modern Space Race," Institut Montaigne, (December 8, 2012),

<https://www.institutmontaigne.org/en/expressions/geopolitics-new-modern-space-race>. Access date 30.11.2024

<sup>2</sup> University of Navarra and María Martín Andrade, "Outer Space, the New Battlefield. Could an Attack against a Satellite Trigger NATO's Art. 5?," Global Affairs and Strategic Studies, (February 2024), <https://en.unav.edu/web/global-affairs/outer-space-the-new-battlefield.-could-an-attack-against-a-satellite-trigger-nato-s-article-5-> Access date 30.11.2024

an international legal framework to prevent the weaponization of space there are many reasons for states to be concerned about their security. If this trend continues, it is likely that destabilization will pursue and, eventually, the placement of weapons in space is likely.

Communications and navigation systems are very vulnerable to strikes, either physical or cyberattacks. This will become another way to destabilize states and wage wars. However, even after having seen all this, a peaceful space environment is not an impossible feat. So far, it has been a more or less neutral place. The distribution of space power has remained somewhat stable over the years but now, with the new multipolar reality and China rapidly catching up to the US at the technological level, uncertainty and tension are growing regarding the future of outer space relations making it a geopolitical challenge<sup>3</sup>.

In this essay the aim is to study how state power is translated to space and the example of the reaction of Spain to the new trends in this area. This is a state that has recently taken measures to keep up with the space advances and it could be enlightening to observe their reaction to this global trend towards extraterrestrial domains in contrast with the actors that have been present in the issue for longer. First, the question is to observe the existing regulation of the matter to understand where states stand in accordance with International Law of space. Then, the concerns arising for the future and future possible tensions that might appear between States. Aspects like a potential security dilemma that could lead into the weaponization of space, spatial debris and the role of governmental actors and private ones in the situation. The last point will be the previously mentioned example of Spain and finally, the conclusions.

### **The regulation of outer space**

Outer space became a concern soon after the launching of the first ever satellite in 1958. Since then, the United Nations, through the General Assembly and in the resolution 1348 (XIII), created a Committee on the Peaceful Uses of Outer Space (COPUOS) that became

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<sup>3</sup> Eirik Billingso Elvevold, "War in Space: Why Not? a Neorealist Analysis of International Space Politics (1957-2018) - ProQuest," Proquest.com, (2018), <https://www.proquest.com/openview/496fb7a305ad11bb973ea4d1c2ac07ee/1?cbl=2026366&diss=y&pq-origsite=gscholar>. Access date 16.11.2024

a permanent body in 1959. The aim of this Committee was to promote peaceful exploration and cooperation between international agents. To keep close contact between governmental and non-governmental organizations in outer space. This organ has permanently been growing making it one of the largest ones in the UN. They have two subcommittees: the Scientific and Technical Subcommittee and the Legal Subcommittee. Outer space is not a recent nor an unexplored issue by the international community.

There have been initiatives to write a normative corpus to which refer to when needed; a reference to guide international action regarding this issue. For this reason, the UN created the Outer Space Treaty (OST), considered by the Legal Subcommittee in 1966. The General Assembly reached the agreement in resolution 2222 (XXI). This was largely based on the *Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space* of 1963 (resolution 1962 (XVIII))<sup>4</sup>. The Outer Space Treaty entered into force in 1967, and it included a set of clear principles that prevented wrong interpretations for the future. Regarding private actors there's a section declaring that initiatives, either governmental or non-governmental, are the responsibility of States. States are also responsible for any damage caused by their own space objects.

In Article 2 of the Annex of the Outer Space Treaty it is stated that "Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.". This resolution is important because it's an instance of a document in which it directly affirms that the UN Charter must be applied to outer space. Regarding private actors and/or action by a group of States, the resolution is clear, and it settles in article 5 that non-governmental actors need authorization and supervision by the state that they belong to. Regarding international organizations it is stated that the responsibility in space is applied to both the international organization and each of the state members.

There are 5 main *corpuses* regulating space matters in which the rules for the matter are displayed for all states to consult. It is managed by the United Nations:

1. The "Outer Space Treaty": Treaty on Principles Governing the Activities of States

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<sup>4</sup> United Nations Office for Outer Space Affairs, "The Outer Space Treaty," UNOOSA, n.d., <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html>. Access date 16.11.2024

- in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (into force in 1968).
2. The “Rescue Agreement”: Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (into force in 1968).
  3. The “Liability Convention”: Convention on International Liability for Damage Caused by Space Objects (into force in 1972).
  4. The “Registration Convention”: Convention on Registration of Objects Launched into Outer Space (into force in 1976).
  5. The “Moon Agreement”: Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (into force in 1984).

The Treaty that acts like the *Carta Magna* for space regulation is the first one, the Outer Space Treaty. This is the Treaty that has been ratified by most states<sup>5</sup>.

### ***State’s jurisdiction in outer space***

Jurisdiction refers to the power of a state to exercise its sovereignty and authority and it is based on the principle of effectiveness. This refers to territory but most often it is more about how a State exercises its power over people, property and events. This concept concerns both international and internal law of states. International Law sets the boundaries and the permissible limits of a state’s jurisdiction. When jurisdiction overlaps, Private International Law enters into force. When it comes to space, the non-appropriation principle prevails (with nuances). The aforementioned Outer Space Treaty clearly states that the use and exploration of outer space is a providence of all mankind (Art. 1). The extraterrestrial domains are extra-jurisdictional territory which means that no state can exercise sovereignty rights over it.

This does not mean, however, that states have no role in outer space matters. On the contrary, there are many different aspects that concern them directly. A state that

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<sup>5</sup> JIMENEZ PIERNAS, Carlos, “¿Qué leyes son las que imperan en el espacio?,” Universidad de Alcalá - Portal de comunicación, (February 7, 2022), <https://portalcomunicacion.uah.es/diario-digital/actualidad/que-leyes-son-las-que-imperan-en-el-espacio/> Access date 16.11.2024

launches a satellite or from which a satellite is launched by a private actor, has the responsibility over that device. They have international responsibilities for national activity in outer space and, to exercise that control, it is necessary to have national legislation about it. National space legislation must be in accordance with International Law. The growing commercialization of this field calls for the development of national legislation to regulate and register both governmental and non-governmental action<sup>6</sup>.

### ***Who are the main actors in outer space?***

#### **States**

The balance of space power is distributed among a few states. The technological capabilities have enabled them to get ahead of the rest of the world and create, in the process, a clear hierarchy of power in the extraterrestrial territory. The US is the leading power with an unmatched investment, industrial base and technical expertise that allow them to be well ahead of the rest of the countries. Their 2023 budget was around 73 billion dollars. Those funds were directed to the military space budget including NASA and the US Space Force (a notable move by the US which created it as an independent body from the Air Force, the sixth military branch in 2019)<sup>7</sup>.

China is another state that has really accelerated their space program. Their aim is to become the global leaders in this field by 2030 and, to do so, they have invested in technology and their exploration program. Their civilian and military space activities are not separated like in the case of the US. In the year 2022, China did half of the Earth observation launches with defense ISR spacecrafts for both military and civil purposes. They have the China National Space Administration (CNSA) as well as their executive counterpart: China Aerospace Science and Technology Corporation (CASC), a state-owned company.

On the other hand, Russia's space program has been observed to be declining after starting the invasion of Ukraine. Their program is handled by its agency Roscosmos

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<sup>6</sup> MARCHISO, Sergio, "THE DRAFT CODE OF CONDUCT FOR OUTER SPACE ACTIVITIES" (UNITED NATIONS/THAILAND WORKSHOP ON SPACE LAW, 3-7, (November, 2010), <https://www.unoosa.org/pdf/pres/2010/SLW2010/02-10b.pdf> Access date 16.11.2024

<sup>7</sup> ELEFTERIU, Gabriel, "The Role of Space Power in Geopolitical Competition," Council on Geostrategy, January 30, 2024, 15-25. <https://www.geostrategy.org.uk/research/the-role-of-space-power-in-geopolitical-competition/> Access date 20.11.2024

rooted to their Soviet full-of-achievements-past. Now, their use of space is completely subordinated to their military needs. This inferiority might seem negative, but Russia has changed tactics: space is now a place for offence. They have been developing their anti-satellite weapons (ASATs) and other counterspace capabilities like RPO satellites to physically interfere with the adversary spacecrafts in orbit<sup>8</sup>.

The Indian program is quickly developing its space power. The Indian Space Research Organization (ISRO) is leading the way into a new era for the country. India became, in 2023, the first state to land on the lunar south pole with affordable and innovative technologies. This has led them to establish commercial opportunities, partnerships and collaborations with other states and private agents<sup>9</sup>. An example of this is India's ISRO partnership with a domestic private contractor, Alpha Design Technologies, to create satellites for their own navigation system<sup>10</sup>. In a similar way, some states in the Middle East have started to deepen their interest in space and have created their own space agencies. The two main examples are Saudi Arabia and the United Arab Emirates.

The last example is the European Union. In this case, space collaboration is done between its member states and, if any responsibility were to be applied to it, it would be done to the member states. They have formed the European Space Alliance (ESA) with a common budget and joint research to have scientific, defense, security and civil applications. The EU has less political and financial power when compared to the different individual states, but they have had several achievements (the creation of a launch company named Arianespace, several navigation and observation satellite fleets such as Galileo, etc.). There are several agencies destined to space: the European Union Agency for Space Programme (EUSPA), the European Geostationary Navigation Overlay Service (EGNOS) as well as the individual state's space agencies.

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<sup>8</sup> Elefteriu, *op. cit.*, 15-25

<sup>9</sup> NADARAJAH, Hema, "India: Advancing the Final Frontier with Self-Reliance and Diplomacy," Asia Pacific Foundation of Canada, (October 23, 2024), <https://www.asiapacific.ca/publication/india-space-advancing-final-frontier-self-reliance-and-diplomacy> Access date 20.11.2024

<sup>10</sup> NADARAJAH, Hema, "The Emergence of New Actors in Space," Asia Pacific Foundation of Canada, (April 10, 2024), <https://www.asiapacific.ca/publication/space-intro-emergence-new-actors> Access date 20.11.2024

Fig.1: "States with space programs"

### Space Agencies' Key Endeavors

No.	Country	Launch	Human Spaceflight	Walked on Moon	Lunar Landings	Martian Missions	Interplanetary Human Missions (planned or proposed)
1	United States (NASA)	Yes	Yes	Yes	Yes	Yes	Yes
2	Russia (Roscosmos)	Yes	Yes	No	Yes	Yes	Yes
3	China (CNSA)	Yes	Yes	No	Yes	Yes	Yes
4	European Union (ESA)	Yes	No	No	No	Yes	Yes
5	India (ISRO)	Yes	No	No	Yes	Yes	Yes

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These examples are proof that states or groups of states are the ones that have historically decided upon space matters. Their experience and expertise is vast and, as their moves suggest, they have no intention of abandoning this domain any time soon. Their interest is tactical and strategic, and they are preparing themselves, as the examples provided show, to hold their ground in space affairs. These are the most prominent states right now in outer space but, in the future, if the trend continues, there will be more. Another trend that should not be ignored is the growing importance of private actors in extraterrestrial ventures.

### ***Private actors***

Private actors are on the rise, but this trend is not new. Private investment in space

<sup>11</sup> Space Insider, "Countries with Space Programs: An Overview," Space Insider, (November 27, 2023), [https://spaceinsider.tech/2023/11/27/countries-with-space-programs-an-overview/#elementor-toc\\_heading-anchor-2](https://spaceinsider.tech/2023/11/27/countries-with-space-programs-an-overview/#elementor-toc_heading-anchor-2).  
 Fecha de la consulta 20.11.2024

created a trend towards a more business-oriented competition and leadership. The number of space companies or start-ups has increased significantly as well as the entrance of non-space consolidated companies such as Google or Facebook who have already set their attention on extraterrestrial domains. The changes have been perceived at all levels: the entrance of new actors; the innovations in the industrial approach; and the significant injection of private investment (especially noticeable in the US) among others<sup>12</sup>.

Extraterrestrial economy has been rapidly growing for the past decade. Space economy is expected to reach past the trillion dollars by 2035 with the advance of space-tech. The significant decrease in launch cost and the commercial innovations means that more activities can be done up there, more than ever. The number of launches has increased (50% more) while the prices to do so have decreased<sup>13</sup>. At the same time the price of data has decreased too. Some of the main companies that have taken advantage of the trend described here are: Blue Origin (US), SpaceX (owned by Elon Musk and based in the US), Galactic Energy (China), Skyroot (India) and MDA (Canada). Some other companies include Arianespace, a singular company created by the European Space Agency (ESA). This company, until SpaceX entered the market, was the one controlling up to 50% of the global launch market<sup>14</sup>.

After having seen this, it is interesting to see the number of satellites in orbit to become aware of the scale of this topic.

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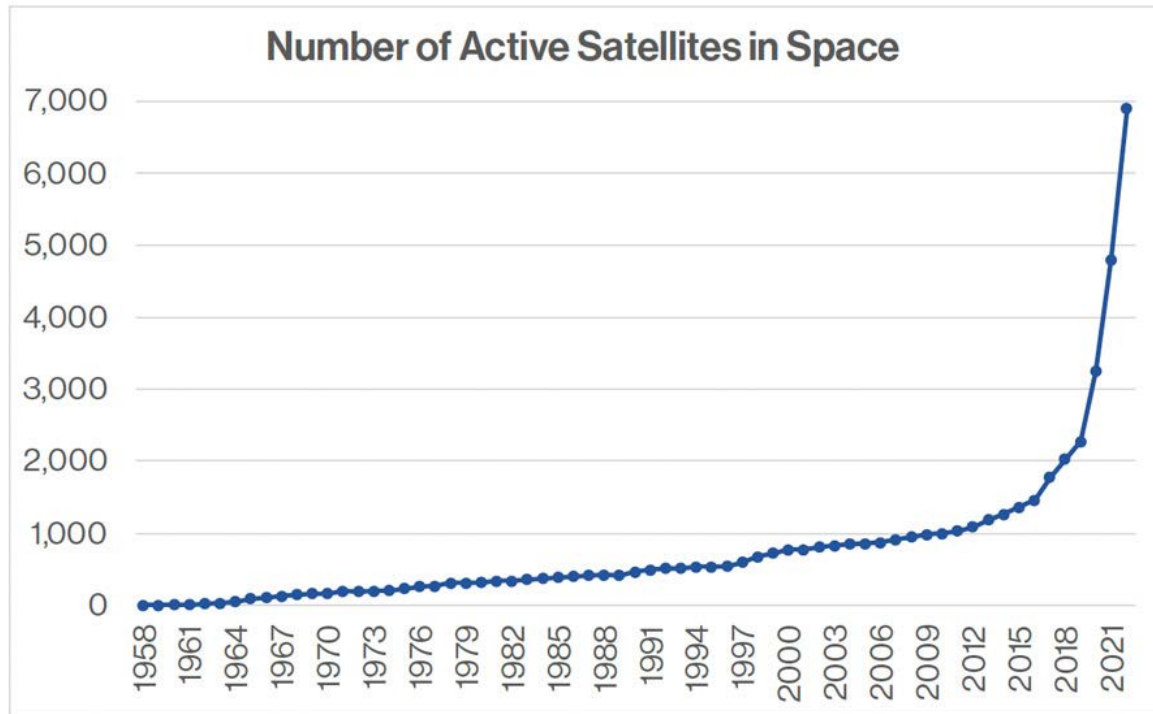
<sup>12</sup> European Space Policy Institute, "The Rise of Private Actors in the Space Sector" (European Space Policy Institute, July 2017), <https://www.espi.or.at/wp-content/uploads/2022/06/ESPI-report-The-rise-of-private-actors-Executive-Summary-1.pdf> Access date 20.11.2024

<sup>13</sup> KHLYSTOY, Nikolai, MARKOVITZ, Gayle, and World Economic Forum, "Space Is Booming. Here's How to Embrace the \$1.8 Trillion Opportunity," World Economic Forum, (April 8 2024), <https://www.weforum.org/stories/2024/04/space-economy-technology-invest-rocket-opportunity/> Access date 20.11.2024

<sup>14</sup> Space Insider, "Top 15 Space Companies in the World [2024]," Space Insider, September 15, 2023, [https://spaceinsider.tech/2023/09/15/best-space-companies/#European\\_Companies](https://spaceinsider.tech/2023/09/15/best-space-companies/#European_Companies) Access date 20.11.2024

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Fig.2: "Number of active satellites in space"



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<sup>15</sup> Avanti, "Successfully Navigating a Multi-Orbit World - Avanti Communications", Avanti Communications, 3 de noviembre de 2023, <https://www.avanti.space/white-papers/multi-orbit/> Access date 16.11.2024

Fig.3: "Active satellites in orbit"



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## Concerns for the future of outer space use

### *Legal gaps in the international legislation*

The international norms drafted for space are not flawless. As it has already been discussed, states cannot claim sovereignty over space or its elements. It has to be used

<sup>16</sup> Statista, "Infografía: Hay más de 10.000 satélites activos sobre nuestras cabezas", Statista Daily Data, (10 de octubre de 2024), <https://es.statista.com/grafico/33226/satelites-activos-en-orbita-alrededor-de-la-tierra/> Access date 19.11.2024

in a peaceful manner, as it was settled in the OST. International cooperation and mutual assistance shall prevail in space... in theory. In practice not all states have ratified all the previously mentioned accords regarding outer space. This is the case with the “Moon Agreement” in which it is stated (article 11) that no action that creates the issue of property is permitted regarding extraterrestrial resources.

The US has not ratified this agreement. In their vision, the Moon is not a shared good for humanity, it is a territory rich in raw materials ready for exploitation from the ones able to reach it. Similarly, Luxembourg, who hasn't ratified the agreement either, has a similar view. Space voyages (likely procured by private actors) are planned to be exploited, just like the raw materials of celestial bodies. This could easily become a point of friction between states and could accelerate or even ignite a war in case those assets were to be menaced. Another issue that is found is the lack of definitions that allows certain assumptions to be made. The existing accords are clear about the prohibition to place nuclear or mass destruction weapons in space. In the OST it is stated, in the preambulatory clauses, that weapons, including nuclear and massive destruction ones, are not allowed. The issue arising here is that, although it might seem like the issue is solved with this clause, there's a gap.

There's no clear definition of “spacecraft” in international law and that's where the gap can be found. A spacecraft that could potentially turn into a weapon constitutes a possibility. It's a matter of policy and legal interpretation. The OST remains unclear how conventional weapons adjust to this principle. This is another legal gap that states could potentially take advantage of to weaponize space<sup>17</sup>. Satellites, even if they are not strictly weapons, can be used for war and give vital information for the military to prepare a strike. This has already happened in the First Gulf War in 1991, when the coalition forces used ISTAR to carry out precision strikes. The issue of weaponization of space becomes a concern for overall state security.

### ***Security dilemma***

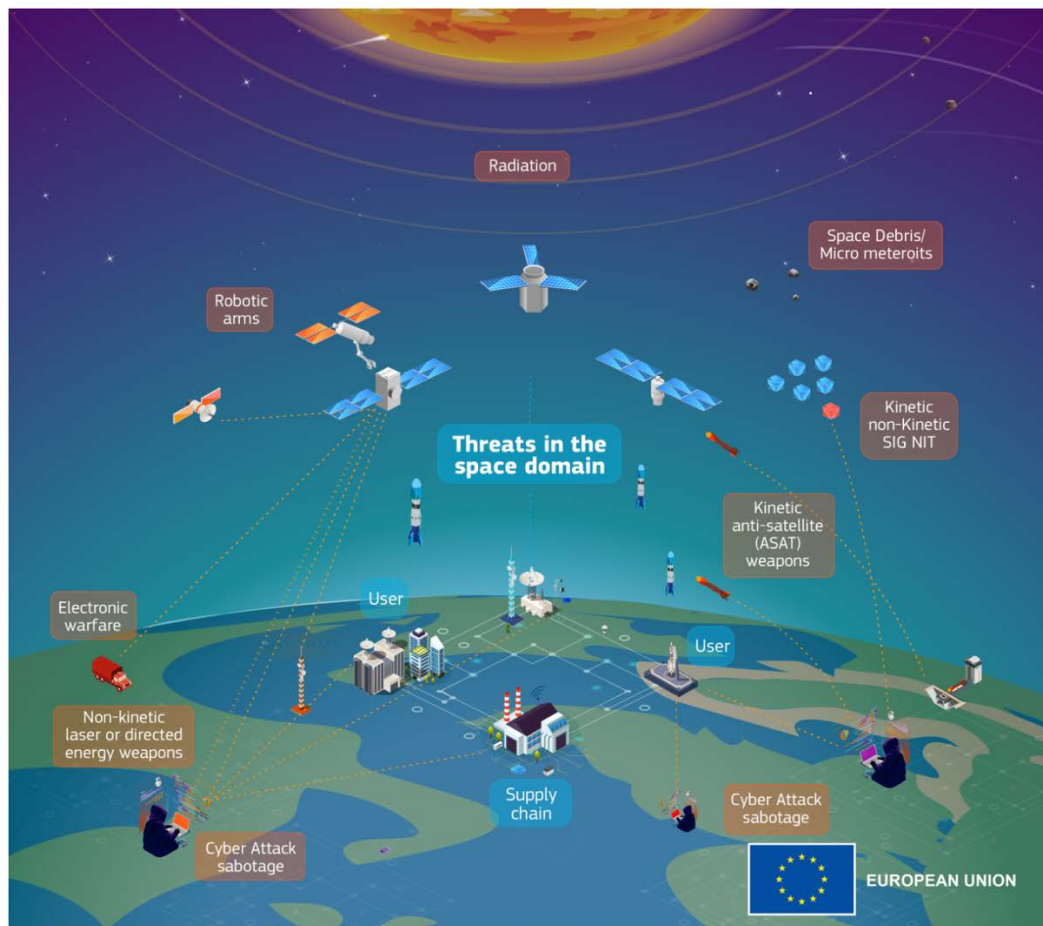
The possibility of weaponizing outer space brings into question the International Relations

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<sup>17</sup> Elvevold, War in Space, 5-6

concept of security dilemma. This means that states, unsure of the intentions of the rest of the international actors, arm themselves for the sake of security. By doing this, they set an escalating cycle in motion. The threats are multiple and not exclusively related to physical weapons. Cyberattacks; robotic arms that can damage satellites; and satellites that can interrupt the functioning of other devices among other threats are being considered by states. Without international legal frameworks to prevent weaponization with precision, destabilization will continue and the placing of weapons in space is likely to occur in the not so far future. Most actors see the potentiality of using space for security and this is the case of the European Union which aims to include in their strategy the use of space “for security and defense purposes”<sup>18</sup>.

Fig.4: “EU’s spatial strategy”

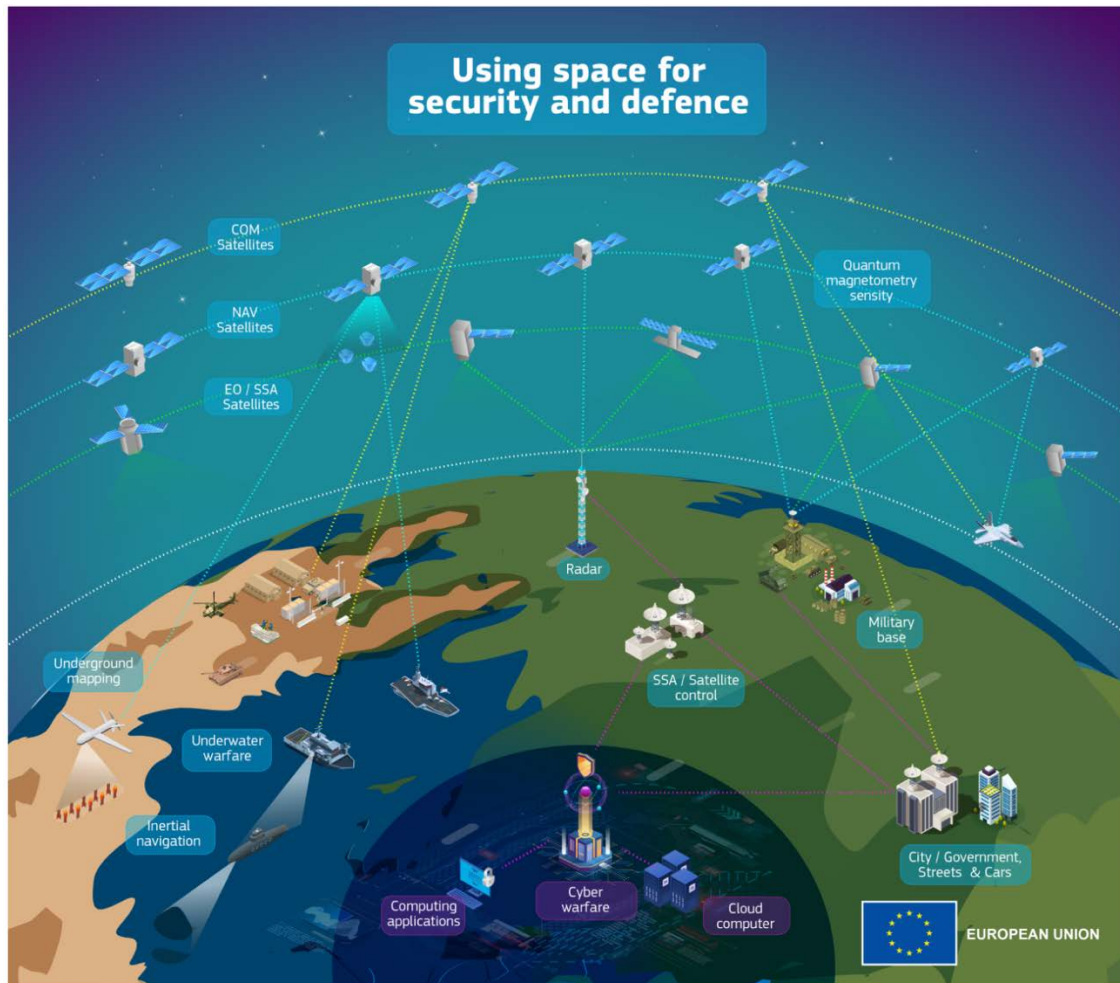


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<sup>18</sup> European Commission, “EU Space Strategy for Security and Defence - European Commission,” European Commission, (2022), [https://defence-industry-space.ec.europa.eu/eu-space/eu-space-strategy-security-and-defence\\_en](https://defence-industry-space.ec.europa.eu/eu-space/eu-space-strategy-security-and-defence_en) Access date 30.11.2024

<sup>19</sup> European Commission, EU Space Strategy

Fig.5: "EU's spatial strategy"



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It is undeniable that space will play an essential role soon, it already has a serious impact in state's policies. As stakes rise and the functions that space provides become increasingly vital, the need to protect the state's interest will rise as well. The key ambitions and elements to protect by states are military operations, economic transactions (bank transactions), communications and monitoring (agriculture, climate, etc.) which could possibly include more aspects in the future. States consider their satellites and those launched by private actors from their territory as their domain and as such, they are ready to protect it. Any damage to those satellites could constitute aggression and trigger a conflict. Damage to satellites creates another security concern: debris.

<sup>20</sup> Ibidem

## ***Space debris***

The number of rockets and satellites that have been launched into space are starting to pose a threat. The risk of collision as the numbers of the devices increase grows. Any piece of machinery left to float free together with satellites that have either been abandoned or that have simply stopped working and bits of paint or any other material fallen off rockets, can be considered debris. There are 3,000 dead satellites orbiting the planet; about 34,000 pieces of space junk that are bigger than 10 cm; and millions of smaller pieces that can create problems if they were to impact on something else. They pose a threat to other satellites in orbit that could cross paths and impact, damaging or even destroying them and creating more debris in the process; this would create a chain reaction that could potentially leave the Earth's orbit impossible to use. This process is known as the Kessler syndrome<sup>21</sup>.

This issue must be tackled by states and the private actors that launch devices. The United Nations Committee on the Peaceful Uses of Outer Space focuses on this. States and international organizations have been exchanging information on debris research at the Committee's Scientific and Technical Subcommittee. The EU has implemented their own complementary approach to the one by the UN. The European Space Agency (ESA) has their own procedure going beyond the guidelines of the UN: the ESA's Zero Debris approach<sup>22</sup>. Additionally, there's also an instance of four civilian space agencies joining forces to face this challenge: NASA (US), Roscosmos (Russia), ESA (EU) and Jaxa (Japan). They came together to create the Inter-Agency Space Debris Coordination Committee (IADC) to mitigate and prevent space debris<sup>23</sup>.

## ***The international community's approach***

The future of space is still being designed today and, because of this, it is precisely now that space can be configured to be used peacefully by all actors. An international

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<sup>21</sup> O'CALLAGHAN, Jonathan, "What Is Space Junk and Why Is It a Problem?," Natural History Museum, (2019), <https://www.nhm.ac.uk/discover/what-is-space-junk-and-why-is-it-a-problem.html>. Access date 30.11.2024

<sup>22</sup> European Space Agency, "New Space Debris Mitigation Policy and Requirements in Effect | OPS Portal," ESA, 2023, <https://esoc.esa.int/new-space-debris-mitigation-policy-and-requirements-effect> Access date 30.11.2024

<sup>23</sup> WEST, Jessica and AZCÁRATE ORTEGA, Almudena, "Norms for Outer Space: A Small Step or a Giant Leap for Policymaking?" (United Nations Institute for Disarmament Research, 2022), [https://unidir.org/wp-content/uploads/2023/05/UNIDIR-Space\\_Dossier\\_7.pdf](https://unidir.org/wp-content/uploads/2023/05/UNIDIR-Space_Dossier_7.pdf) Access date 30.11.2024

framework is essential to discuss all the worries that states and other actors have regarding space. The security challenge remains one of the most urgent ones and the UN is aware. Some states have declared space a war-fighting domain which highly concerns the UN as this could trigger an arms race. This is why the organization reiterates the importance of keeping outer space as a neutral place. As launches of satellites increase and cyberattacks do so as well, the UN is concerned for the rapidly growing stakes of international security.

There is a need to avoid misunderstandings between states. Transparency between actors implies sharing data. This has been done before in other domains: the bilateral agreement, in 1972, between the US and the Soviet Union creating the Incident at Sea Agreement to avoid collisions at sea. This same principle could be applied to outer space which is precisely the initiative that proposes the EU: a common framework for security and sustainability, the EU Space Law which will be discussed in 2025. The European External Action Service (EEAS) suggested creating an International Code of Conduct for Outer Space Activities. It was drafted in 2014, but it never became a reality<sup>24</sup>. The topic has not been left for oblivion, the UN periodically, through the General Assembly, insists on the need for transparency.

## **The international reaction to the issue of space: Spain**

### ***Spain***

Outer space in Spain had not, until relatively recently, been a particularly pressing issue. As spatial concerns became apparent for the European Union, so did for Spain. In Europe, the actor with the most understanding of space power is France, but this does not mean that the rest of the states remain static before the challenge. Spain is no stranger to spatial measures: in the last years there have been numerous initiatives involving decisions in those matters. Some examples include the Strategy of Aerospace Spanish Security; the National Strategy on Cybersecurity; and the creation of the COVE (Centro de Operaciones de Vigilancia Espacial<sup>25</sup>) aimed at surveilling spatial activities.

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<sup>24</sup> European Union External Action, "EU Proposal for an International Space Code of Conduct, Draft | EEAS Website," European Union External Action, March 31, 2014, [https://www.eeas.europa.eu/node/14715\\_en](https://www.eeas.europa.eu/node/14715_en) Access date 30.11.2024

<sup>25</sup> Boletín Oficial del Estado, "Real Decreto 524/2022, de 27 de Junio, Por El Que Se Dispone El Cambio de

Spain has made a series of adjustments and changes to be able to respond and participate in the development of the future policies for the extraterrestrial domains. In 2023 the Spanish spatial agency was created, the AEE (Agencia Espacial Española)<sup>26</sup>.

Before this new body, Spain administered the issues and challenges related to space through two main bodies: the CDTI (Centro para el Desarrollo Tecnológico Industrial) and the INTA (Instituto Nacional de Técnica Aeroespacial). Both organisms have worked together to consolidate a firm cooperative base to coordinate space initiatives and satellite navigation among other actions. The CDTI depends on the Ministry of Science, Innovation and Universities. It was the Spanish delegation before the ESA from 1986 to 2023. Its main function was to manage, through accords with third parties, the Spanish industry's participation in high-tech projects. On the other hand, the INTA is an organism that depends on the Ministry of Defense. It is dedicated to aerospace research, spatial science and technological development. Their main mission is to innovate and develop new technologies as well as support technically and scientifically other Spanish and international industries.

The creation of the AEE (Agencia Espacial Española) was aimed at contributing to the national security strategy of Spain, to elaborate the action plan in the matter of spatial strategy. They support the activities related to spatial traffic and surveilling the activities related to Space Surveillance Tracking (SST) and Space Situational Awareness (SSA); and they take care of cybersecurity and information protection among other activities<sup>27</sup>. Spain has increased, throughout time, its level of participation in the European Space Agency. Through the Ministry of Science, Innovation and Universities, Spain augmented, in 2022, its contribution to the ESA<sup>28</sup>. The country, as seen in 2023, will extend its contribution to a maximum annually to the ESA until 2027. This trend matched the state's measures taken to better prepare itself for the global trends concerning this issue. In the

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Denominación Del Ejército Del Aire Por La de Ejército Del Aire Y Del Espacio." (2022), [https://www.boe.es/diario\\_boe/txt.php?id=BOE-A-2022-10787](https://www.boe.es/diario_boe/txt.php?id=BOE-A-2022-10787). Access date 30.11.2024

<sup>26</sup> Boletín Oficial del Estado, "Real Decreto 158/2023, de 7 de Marzo, Por El Que Se Aprueba El Estatuto de La Agencia Estatal 'Agencia Espacial Española'." (2023), <https://www.boe.es/buscar/doc.php?id=BOE-A-2023-6082> Access date 30.11.2024

<sup>27</sup> Agencia Espacial Española, "Defensa Y Seguridad," Aee.gob.es (Agencia Espacial Española, 2025), <https://www.aee.gob.es/Seguridad.html> Access date 30.11.2024

<sup>28</sup> Ministerio de Ciencia, Innovación y Universidades, "El Ministerio de Ciencia E Innovación Aumenta En Un 20% La Aportación de España a La Agencia Espacial Europea," Ministerio de Ciencias, Innovación y Universidades, 2022, <https://www.ciencia.gob.es/Noticias/2022/Noviembre/El-Ministerio-de-Ciencia-e-Innovacion-aumenta-en-un-20-por-ciento-la-aportacion-de-Espana-a-la-Agencia-Espacial-Europea.html> Access date 30.11.2024

same vein, Spain currently has 39 functioning satellites in orbit (either for military, civil use or both at the same time). The table with further information can be found in the annex.

More evidence that Spain's view of space has evolved, is the change of name that they did of the Air Force in 2022. The name was changed to include outer space: instead of Ejército del Aire it became Ejército del Aire y del Espacio<sup>29</sup>. The new existing threats demand resilient states that can adapt to the changes. Outer space contains numerous menaces (as observed in this essay) that can pose a real threat for the continuation of states. Extending the title of the Air Forces to include outer space shows that Spain is ready to set its attention and power to newer domains. This geostrategic area has to be addressed, and this is a way to do it.

## Conclusion

All through this essay one thing is apparent: space is where the future is headed. It has revolutionized everything: communications, private initiatives, commerce, geolocation, etc. It has shaped a new world in which truly unthinkable technologies are available for everyone to use. Space, as a tool, can be used for good or not so good purposes. We have seen satellites being used to track climate change and keep in check environmental phenomenon. But we have also seen satellites being used to better locate objectives to bomb during wars.

Whether space will be a peaceful venture or not is still a matter to decide. The evidence that has been analyzed suggests that the tendency is towards a new arms race involving space which can have unprecedented consequences in case of a war. The existing treaties are the base from which to build upon. The challenge remains in the fact that states can choose to take advantage of the existing gaps in treaty, like the OST, or refuse to sign treaties that establish peace and a common objective involving raw materials of outer space like it is suggested in the Moon Treaty. It is time for all actors to decide if they want to come together to create clear guidelines that encourage transparency and collaboration or if they want to set the rules of a future space war. In all of this, private

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<sup>29</sup> Boletín Oficial del Estado, Real Decreto 524/2022

actors have a say. They will also have to choose between profit at all cost or sustainability. Space debris has been shown to be a potential game over if actors are not careful. The worst-case scenario would take humanity down a pathway in which all modern, satellite-based telecommunications, would be over. Private actors will also have a say on security matters. As technologies advance and private costs decrease with innovation, they will likely become the providers for states.

The security dilemma has been a pressing matter everywhere on Earth and transferring it to space would have devastating consequences. It is only a matter of time before a state will make the decision, the fear induced decision, to put nuclear weapons in orbit. This would create a new Cold War with unprecedented destruction potential that would be able to end humanity in a matter of seconds. It seems like this is the inevitable ending, the fate bound pathway that humanity is destined to cross. However not all hope has been lost. Organizations like the UN but also the EU have made timid but powerful steps towards the elaboration of an International Code of Conduct for Outer Space, a Space Law. Initiatives like this could make the difference and break the security dilemma vicious cycle. Only through collaboration and open cooperation can there be a future that does not end in catastrophe.

**Annex**

Table 1: "Spanish satellites in orbit"

<b>Name of the satellite in orbit</b>	<b>Year of launch</b>	<b>Type of satellite</b>
<b>1. INTASAT</b>	1974	Microsatellite designed to watch the irregularities in the atmospheric layer.
<b>2. HISPASAT 1A</b>	1992	The Spanish enterprise Hispasat created this satellite for telecommunications that also serves defense purposes for Spain.
<b>3. HISPASAT 1B</b>	1993	Telecommunications and broadcasting satellite
<b>4. UPM/LBSAT</b>	1995	Universidad Politécnica de Madrid's satellite created for science, education and technological developments.
<b>5. HISPASAT 1C</b>	2000	Telecommunications satellite.
<b>6. HISPASAT 1D</b>	2002	Telecommunications satellite.
<b>7. DEIMOS 1</b>	2009	Communications satellite for developing areas of the world. The initiative was promoted by the University of Vigo for its engineering and science students with support from UNOOSA and ESA.
<b>8. HISPASAT 1E</b>	2010	Telecommunications satellite between Spanish and Portuguese-speaking markets.
<b>9. OPTOS</b>	2013	Satellite designed by the Instituto Nacional de Técnica Aeroespacial. This satellite is used for scientific experiments in optics, radiation, and magnetics.

<b>10. HUMSAT D</b>	2013	Telecommunications satellite.
<b>11. DEIMOS 2</b>	2014	Satellite for obtaining high-resolution images of the Earth.
<b>12. HISPASAT 36W-1</b>	2017	Telecommunications satellite.
<b>13. PAZ</b>	2018	Earth observation satellite. Radar satellite.
<b>14. HISPASAT 30W-6</b>	2018	Telecommunications satellite to improve internet access in rural areas. It was the result of a public-private partnership.
<b>15. AISTECH SAT-2</b>	2018	Communications satellite for controlling and tracking air traffic by satellite.

<b>16. UPMSAT-2</b>	2020	Experimental microsatellite for scientific and educational use.
<b>17. 3CAT-5/A (TVAK-0161)</b>	2020	Telecommunications satellite.
<b>18. 3CAT-5/B (TVAK-0161)</b>	2020	Telecommunications satellite.
<b>19. GUARDIAN 1</b>	2022	Satellite for monitoring forest fires.
<b>20. MENUT</b>	2023	Satellite for observing the Earth to manage land and combat climate change.
<b>21. GEISAT PRECURSOR</b>	2023	Satellite to detect methane in the atmosphere.
<b>22. ANSER FLW1</b>	2023	Satélite de observación de ríos, embalses y lagunas de la Península Ibérica.
<b>23. ANSER FLW2</b>	2023	Satélite de observación de ríos, embalses y lagunas de la Península Ibérica.
<b>24. HORACIO</b>	2024	Satellite for observing greenhouse gas emissions.
<b>25. HAMMER</b>	2024	Mapping satellite.

<b>26. 3CAT-4</b>	2024	Weather and climate satellite.
<b>27. LUR-1</b>	2024	Earth surface observation satellite.
<b>28. SATELIOT 1</b>	2024	Satellite to automatically connect IoT (Internet of Things) devices when there is no coverage.
<b>29. SATELIOT 2</b>	2024	Connectivity satellite.
<b>30. SATELIOT 3</b>	2024	Connectivity satellite.
<b>31. SATELIOT 4</b>	2024	Connectivity satellite.
<b>32. GARAI-A</b>	2025	Earth observation satellite.
<b>33. FOSSASAT 2E19 (TAT-E)</b>	2025	Communications satellite.
<b>34. FOSSASAT 2E18 (TAT-A)</b>	2025	Communications satellite.
<b>35. HADES-R</b>	2025	FM repeater satellite. It is a radio telecommunications satellite.
<b>36. HYDRA-T</b>	2025	6G research satellite.
<b>37. SPAINSAT NG1</b>	2025	Telecommunications satellite for the Spanish Armed Forces and NATO.
<b>38. FOSSASAT 2E20 (TAT-O)</b>	2025	Communications satellite.

(Own elaboration)

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<sup>30</sup> N2YO.com, "SATELLITES BY COUNTRIES AND ORGANIZATIONS", N2YO.com, 2025, <https://www.n2yo.com/satellites/?c=SPN&t=country> Access date 10.01.2025