SPACE ALLIANCES AND THREATS IN EXPLORATION

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Abstract

In this paper, I have sought to answer the question of under what conditions the current alliance systems will change, and in what direction the major rivals will have to rethink their strategies. The role of space activities is now a condition of being a great power, but China and Russia are lagging far behind in this respect. At the same time, we need to work together to tackle natural disasters and threats from space. The threats are becoming more and more imminent with the use of space and the advent of space mining and counterspace weapons is not making the situation any easier. Yet everything comes together to form a strategy for planetary defence.

Keywords: counterspace capabilities, Artemis Accord, Planetary defense, new alliances, sustainability, threats and hazards
Disciplines: military sciences, social sciences, engineering sciences

Absztrakt
ŰRSZÖVETSÉGEK ÉS FENYEGETÉSEK A FELFEDEZÉSBEN
A jelen tanulmány megirása során arra a kérdésre kerestem a választ, hogy milyen feltételek mellett módosulnak a jelenleg fennálló szövetségi rendszerek, a nagy riválisok milyen irányban kell, hogy átgondolják stratégiájukat. Az űrtevékenységek szerepe ma már nagyhatalmi feltétel, azonban erre vonatkozóan Kina és Oroszország jelentős lemaradásban van. A Földünket veszélyeztető természeti katasztrófák és a világűrből érkező fenyegetések leküzdéséhez ugyanakkor összefogásra van szükség. A veszélyek a világűr használatával egyre fenyegetőbbé válnak és az előttünk álló űrbányászat és counterspace fegyverek megjelenése sem könnyiti meg a helyzetet. Ugyanakkor a bolygóvédelem stratégiájának kialakitásában mégis minden együttesen kap szerepet.
Kulcsszavak: counterspace capabilities, Artemis Accord, Bolygóvédelem, új szövetségek,-fenntarthatóság, veszélyek és fenyegetések
Diszciplinák: hadtudomány, társadalomtudomány, műszaki tudomány

I have based the contents of the present publication on my thesis entitled The Influence of Outer Space in 21st Century Geopolitics, defended in 2024. I have evaluated the materials revealed in the course of my research independently and in context together. My research methodology is unique, with the specificity of a systematic geopolitical analysis developed by Ioannis Mazis, in addition to qualitative and quantitative methods (NET1). I combined the systematic geopolitical analysis with quantitative, qualitative and comparative methodologies, and used a sub-chapter by sub-chapter induction method to arrive at the conclusions. The central element is a comparison of the US, Europe, Russian Federation (thereafter Russia) and China. I have used the systematic geopolitical analysis method to delineate the systems and subsystems through which I have examined space as a supra-system. The systems are remarked by countries or, as in the case of Europe, by regions based on territorial size or fragmentation. I have used the designation Europe or EU (including EFTA) or European Space Agency (hereinafter referred to as ESA) throughout the study, but for space activities they overlap and I mean the same region. The systems are linked by the subsystems where the specific space activity is carried out, such as launch stations, professional organisations or orbiting space stations.

The specificity of the systemic geopolitical analysis is given by the final element of the methodology, the "Suprasystem". The difference of the "Suprasystem" can be found in its name, which is separated from the "Super-system" by a faint line. The designation "super" means something on top of something and also gives a physical expression to the word association with it. The term "supra", however, refers more of a phenomenal term. This suggests a method of analysis that is more pervasive and more penetrating to the point. Thus, the main element of systemic geopolitical analysis is space activity, which permeates and embraces the specific activities of the countries of the world at a given place and time, which are related to the domain nature of space. I have also identified geopolitical factors (military, economic, political, social), which I have analysed in terms of space activities through a number of indicators such as the size of the military, the political establishment, Gross Domestic Product (hereinafter referred to as GDP), legal regulation, economic line, mineral resources, technology, social preparedness, etc.

New allied systems

The start of space exploration coincided with the beginning of the Cold War, after which weakened European countries and others suffering the trauma of world war had accepted the leadership of the US and the Soviet Union. It was as much an ideological struggle as an economic or military one, but it was also, by virtue of these, rife with geopolitical conflict. After the collapse of the Soviet Union, countries became more economically and politically stable, and thus more independent to participate in the various alliance systems in their own right. In this publication, I will focus on the political and social geopolitical factors and within them, as geopolitical indicators, I will examine the allied system and international cooperation of countries with regard to space activities.

I will list some alliances in order to situate the countries of the world according to their interests. I will not give examples of alliance systems on the basis of their military or economic nature, but as a form of cooperation between countries. During the Cold War, the Warsaw Pact, which brought together the countries of Central and Eastern Europe under the leadership of the Soviet Union, was established in 1955, alongside NATO, which was founded in 1949. During the Cold War, the UN was the highest level international meeting place for the leaders of countries, particularly US and Soviet diplomats, but its internal organisation and policing have long been subject to increasing criticism, earning it the title of 'the sick man of international organisations' (Mruwat; United Nations: Critiques and Reforms, 1998, p. 235). However, this comment seems to be more a criticism of the UN's overall activity in addressing a particular problem than an appropriate assessment of an organisation with such a wide and multifaceted remit. The European Economic Community, known as the predecessor of the EU (1994), was founded in 1957 and was soon followed by the Union of South American Nations (2008), which was formed from the Andean Community (1968) and MERCOSUR (1986).

The Eurasian Economic Union was founded in 2014 and the Pacific Forum in 1971. The African Union was established in 2002 as the successor to the Organisation of African Unity, which was created in 1963. A similar organisation was the Council for Mutual Economic Assistance (Сове́т Экономи́ческой Взаимопо́мощи, СЭВ), which operated from 1949 to 1991, but which itself ceased to exist with the break-up of the Soviet Union. The oldest surviving form of cooperation, apart from the EU, is the OECD, which was founded in 1961. Like these institutions, but mainly to preserve cultural and geographical unity, the League of Arab States was created in Egypt in 1945. The list is not exhaustive, but it does illustrate the alliance systems of the various countries and regions and shows that nations are not only willing to cooperate with the countries of their choice, or to seek alliances that are favourable to them, but also to participate in organisations that bring together all the countries of the world, showing that they do not want to be left out of the overarching affairs of the planet.

Next, let's look more specifically at the main international alliances, which I have analysed in Table 1 according to where the spacefaring countries or regions under study (US, Europe, Russia, China) belong – again without separating military and economic alliances - as a form of social cooperation (NET2). I considered EU countries and ESA member states as a common alliance system and labelled them as "EU and ESA".

As Table 1 shows, Russia's influence continues to be concentrated in the successor states of the former Soviet Union. China is a member of the G20 and G33 group of developing countries, but South Africa and India are now also members of these groups, as ’more or less’ Western allies in other areas. Russia and China can act separately without the US, EU and ESA in these areas and in the BRICS group. At the same time, all four space powers are members of international organisations in which they must necessarily cooperate and jointly shape the world geopolitical map. It should be noted that the mosaic of BRICS countries was created by the US financial advisory firm Goldman Sachs, based on an investment strategy – not for governments but for companies and other organisations (NET3). In 2003, a specific academic study was carried out, followed in 2005 by a study on the 11 developing countries that follow the BRICS, designated as the N-11, which were then designated as future allies, and then, in 2009, the BRICS was formed (NET4, NET5). On 23 August 2023, membership expansion was announced,

Table 1: Main international alliances. Source: NET2

n	Alliances	Country (db)	Involved
1.	Asian Development Bank, ADB	68	China, US, EU & ESA
2.	African Union	55	
3.	Arab League	22	
4.	BRICS countries	5	China, Russia
5.	Community of Latin American and Caribbean States, CELAC	33	
6.	Commonwealth of Independent States, CIS	10	Russia
7.	Commonwealth of Nations	52	US, EU & ESA
8.	European Union	27	EU & ESA
9.	G20 – Developing Nations	23	Kína
10.	G20 – Group of Twenty	19	China, US, EU & ESA, Russia
11.	G33 – Forum for developing countries	44	China
12.	G7 plus – Group of Fragile States	20	
13.	G8 –Group of Eight	8	US, EU & ESA, Russia
14.	GCC – Gulf Cooperation Council	6	
15.	Latin Union	38	EU & ESA
16.	Magreb	6	
17.	Mashrek	7	
18.	NATO – North Atlantic Treaty Organization	311	US, EU & ESA
19.	Non–Aligned Movement	120	
20.	Organization of American States, OAS	34	EU & ESA
21.	OECD	36	US, EU & ESA
22.	Organization of Islamic Cooperation, OIC	56	
23.	OSCE	57	US, EU & ESA, Russia
24.	Central American Integration System, SICA	8	
25.	Schengen Countries	27	EU & ESA
26.	Turkic Council	5	
27.	United Nations, UN	193	China, US, EU & ESA, Russia
28.	UNESCO	195	China, US, EU & ESA, Russia
29.	Union of South American Nations, USAN	12	
30.	Visegrad countries, V4	4	EU & ESA
31.	World Trade Organization, WTO	159	China, US, EU & ESA, Russia

following the example of the 2005 study. (NET6) What makes it difficult to understand how the organisation works is that of the 6 new members, Saudi Arabia, Argentina and the United Arab Emirates have signed the Artemis Agreement, the basic document of the US-led moon landing programme, and Saudi Arabia is planning to send its first female astronaut into space soon, in partnership with the US company Axiom Space. (NET7) In 2025, the BRICS+ countries became only by 5 countries as follows: Iran, UAE, Egypt, Ethiopia and Indonesia.

International cooperation can be greatly helped by a common, vibrant space programme for all countries. The three countries mentioned above want to develop their space capabilities within the framework of the US and its alliance system, despite the fact that China and Russia are both space-faring nations and capable of putting a manned program into space. Similarly, India, as a US space ally or as a beneficiary of the new US economic expansion. At the same time, at the BRICS meeting of 23 August 2023 mentioned above, Indian Prime Minister Modi put forward a five-point proposal for BRICS countries to cooperate. These included space exploration, spares for traditional medicines, education development, digital infrastructure sharing and protection of big cats in all five countries. (NET8)

ARTEMIS, new alliance

The moon voyage seems to be repeating itself today. However, countries are no longer undertaking them independently, but have agreed to cooperate in international agreements. At the same time, the world is once again divided into two parts. One part is attempting to travel to the moon under the US-led Artemis agreement (2020), while the other part is attempting to travel to the moon under the Chinese Lunar Exploration Program (2021), a coalition led by the chineese International Lunar Research Station (ILRS).

The first moon landing was 55 years ago, so there is no particular reason to believe that the stakes of this race are high enough to change the status quo. Almost 60 years ago, the US went it alone with the Apollo programme, using much simpler IT tools than today, and sent twelve astronauts to the surface of the Moon by 1972. The dates and the order of the (sub)missions of the Artemis agreement and the ILRS are constantly changing, so I have used the names and dates that emerged in my first analysis, together with presenting the unsucceful dates shown up in the plans of parties.

NASA's original declared goal was to prepare the first woman and the first astronaut in colour for the lunar landing, as part of the Artemis-2 programme, in 2024. (NET9) They will also pave the way for the exploration of Mars. (NET10) Under Article 1 of the Agreement, the lunar missions will be carried out in the framework of civil space activities, for exclusively peaceful purposes as set out in Article 2, in accordance with international law and the provisions of the Outer Space Treaty. The Artemis Agreement reiterates the basic principle of the Outer Space Treaty for the protection of celestial bodies and, in accordance with Article 2 of the Outer Space Treaty, Article 10 (2) prohibits the expropriation of raw materials found in space by any nation. Article 11 of the agreement provides for the establishment of safety zones on the celestial bodies, in which the participating countries have an obligation to inform each other and to cooperate. They must behave in a special way around the safety zones to prevent possible damage. Article 12 of the agreement regulates the issue of space debris, in line with the previously established legal framework, and emphasises the removal of space debris left over after space activities. Article 4 of the Agreement contains the main general element of international treaties, the obligation to share scientific results between participating countries. Resembling, China similarly refers back to the peaceful uses of outer space and the sharing of results in its White Paper on space activities to be published in 2022 (NET11). The agreement was introduced in 2020 with the signature of 8 countries –

Australia, Canada, Italy, Japan, Italy, Luxembourg, Saudi Arabia, US, UK. As of June 2023, 27 countries – Colombia, Bahrain, Brazil, the Czech Republic, Ecuador, France, Israel, Mexico, New Zealand, Nigeria, Poland, Romania, Rwanda, Singapore, South Korea, Spain, Ukraine, the Man Islands, the United Arab Emirates, the United Kingdom, the United States, the United Kingdom of Great Britain and Northern Ireland, the United States of America, the United States of America, Rwanda, Singapore, Spain, Ukraine and the Isle of Man – have signed. Germany and a number of European countries are not on the list, but ESA has signed a separate contract, as it did when it built the ISS, stipulating that ESA will contribute to NASA's 53 agreement with the Gateway programme, among many other space activities. This includes the construction of a lunar orbiting station with service, communication and living quarters for astronauts. In addition, a number of ESA astronauts will of course participate in the programme. (NET12) As of 23 June 2023, one of the consequences of US President Joe Biden's visit to India is that India has joined the Artemis agreement. Argentina signed it on 27 July 2023 as the 28th country in line, followed by Germany on 25 September 2023 (NET13, NET14). It is important to note that the acceding countries do not necessarily have to take a role in the Moon landing, but they can benefit from the results and, by signing, they are expressing political will. As of april 2025, 54 countries have signed the Agreement.

The basic tool of the Artemis agreement is the Orion space instrument, developed by NASA and ESA with the involvement of private companies. The project was launched in 2012 and this spacecraft will play the main role in transporting astronauts to the Moon and also in creating the astronaut habitat (NET15). As part of the Artemis-1 programme, a test flight of the Orion spacecraft was carried out on 16 November 2022 by NASA's SLS super-heavy rocket (NET16). Prior to the launch, NASA's Jim Bridenstine proposed the use of commercial rockets instead of the SLS, such as SpaceX's Falcon Heavy or United Launch Alliance's Delta IV Heavy, to provide more options for the future lunar landing planned for 2024-2025 (NET17). However, it is already certain that SpaceX's Starship will carry astronauts to the southern hemisphere in 2025 as part of the Artemis-3 programme (NET18). The dates are likely to keep changing. During the writing of this publication, there have been various changes from both the US and China on the progress of lunar programmes.

After nearly a year of negotiations, in 2021, Russia's Roscosmos and China's National Space Agency agreed to establish a lunar base. A few years earlier, China had already carried out exploratory research and carried out a non-manned landing on the far side of the Moon as part of the Chang'e 4 programme. Further plans for the construction of a lunar base are still in the planning stages, but the Chang'e mission series will continue in 2021-2025, and Roscosmos will continue its Luna programme (50 years after the completion of Luna-24, continuing with Luna-25, due in 2023). These exploration programmes will be used as a basis for lunar rock collection, cargo shipments and other joint exploration programmes until 2035. Only then will the first astronauts be able to land on the surface of the Moon and scientific research and the expansion of the research station can take place (NET19). In addition to Russia and China, the United Arab Emirates and the Asia-Pacific Space Cooperation Organization (APSCO, its members are: Turkey, Pakistan, China, Thailand, Mongolia, Peru, Iran, and Bangladesh) have joined the initiative, but negotiations are ongoing with a number of countries. The UAE was now facing the problem that the US has found it in breach of the International Traffic in Arms Regulations (ITAR) and has banned the supply of accessories for the Emirati lunar module Rashid 2 (NET20). The Rashid lunar module was developed by the United Arab Emirates in cooperation with ESA and landed on the Moon in the Hakuto-R spacecraft of the private Japanese company Ispace. Unfortunately, the spacecraft and the rover on board crashed into the lunar surface on 25 April 2023 (NET21). As of 2025 the members are China, Russia, Venezuela, South Africa, Azerbaijan, Pakistan, Belarus, Egypt, Thailand, Nicaragua, Serbia, Kazakhstan and Senegal.

From the above agreements, we can infer that China still intends to develop a counter-pole to the US and its allies, but looking at the timeframe, it is almost a decade behind the Artemis agreement. Unfortunately, it is hampered in this by Russia's war against Ukraine.

International cooperation on sattelites

Cooperation in space exploration can be illustrated in a similar way today through satellites. Artificial moons are the basis of all countries' space activities, i.e. each country is striving to launch its own satellite and thus introduce technological innovations and ensure a certain degree of independence for its country. However, not all countries have the technological capabilities to develop and manufacture their own satellite and then launch it into orbit. This of course also includes the ongoing operation of the satellite, which also requires specific expertise. In the following table I have collected the world's top ten companies exporting the most artificial satellites, in order from largest to largest (NET22).

Table 2: Satellite export by country in 2021. Source: NET22

Company	Head-quarter
Airbus	Netherlands
Boeing	US
Lockheed Martin Corporation	US
Northrop Grumman	US
Thales Group	France
SpaceX	US
Maxar	US
Mitsubishi	Japan
Ball Aerospace and Technologies	US
India Space Research Organizations	India

Of course, Table 2 does not mean that only these companies are capable of producing satellites. Many countries can produce satellites themselves, as can Hungary. However, the report by the French-based analytical firm ASD Eurospace on satellite exports over the last two decades is noteworthy, with the main figures summarised below (NET23):

1. Since the 1990s, the export market for satellites has been developing, with many countries being the first to have access to space technology. Telecommunications satellites account for 95% of the value of satellite exports ($28 billion). With the US being the largest exporter, followed by Europe, which accounts for 90% of the world's exports.

2. Between 2009 and 2019, the US exported $14 billion worth of telecommunications satellites to the rest of the world, Europe $10 billion, China $2 billion and Japan $1 billion.

- Europe and the US on a bilateral basis: Europe exported $3.83 billion worth of telecommunications satellites to the US and the US exported $5.92 billion worth of telecommunications satellites to Europe.
- The US exported $2 billion worth of telecommunications satellites to China, one-way exports only.

3. In the field of remote sensing satellites, prior to 2008, Europe and the US exported 98% of remote sensing satellites and Russia the remaining 2% (total: $7-800 million), of which 50% was accounted for by US exports to Japan and 8-9% each by Europe and equal parts of US exports to South Korea and Taiwan. European exports to Canada accounted for 15%, Singapore and Thailand for 5-6% each and Turkey, China, US, Nigeria, Malaysia for 1-3% each. Russia exported in equal shares of its remote sensing satellites to Egypt and Iran.

4. However, between 2009 and 2019 (total: USD 1.3-1.4 billion), Russia and China took a larger share of exports, alongside Europe and the US. China exported 30% of its remote sensing satellites, mainly to Brazil, Venezuela and Pakistan. Russia exported 9-10% of its remote sensing satellites, mainly to Egypt and South Africa. The US exported a negligible amount of satellites, less than 1% of the total, and only Kazakhstan. The remaining 55-60% was exported from Europe, mainly to Algeria, Kazakhstan, Morocco, Nigeria, Peru, Singapore, South Korea, Turkey, the US and Vietnam.

The impact of the changes in the world and the COVID-19 situation, as well as the economic problems that have affected the space industry since then, cannot yet be analysed in a trend analysis, but the last two decades provide a more reliable picture for analysing the phenomena that will influence the formation of future alliances.

International cooperation in launching activity

As few countries have the capability to launch beyond the atmosphere, it is of the utmost importance for all countries to launch their space assets into space with the help of a capable country. However, not all countries that do have missile capabilities are able to make their missiles continuously and safely available to others. Many countries, as well as private companies and universities, want to carry out research and experiments in space, so finding the right service provider is essential to achieve their results. In my dissertation, I have analysed the spacecraft deployments for the years 2022- 2023, with a monthly breakdown by launching and commissioning country(ies), by spacecraft and by purpose of the space-craft (Rezsneki, A világűr jelentősége a 21. századi geopolitikában, 2024, 147-150).

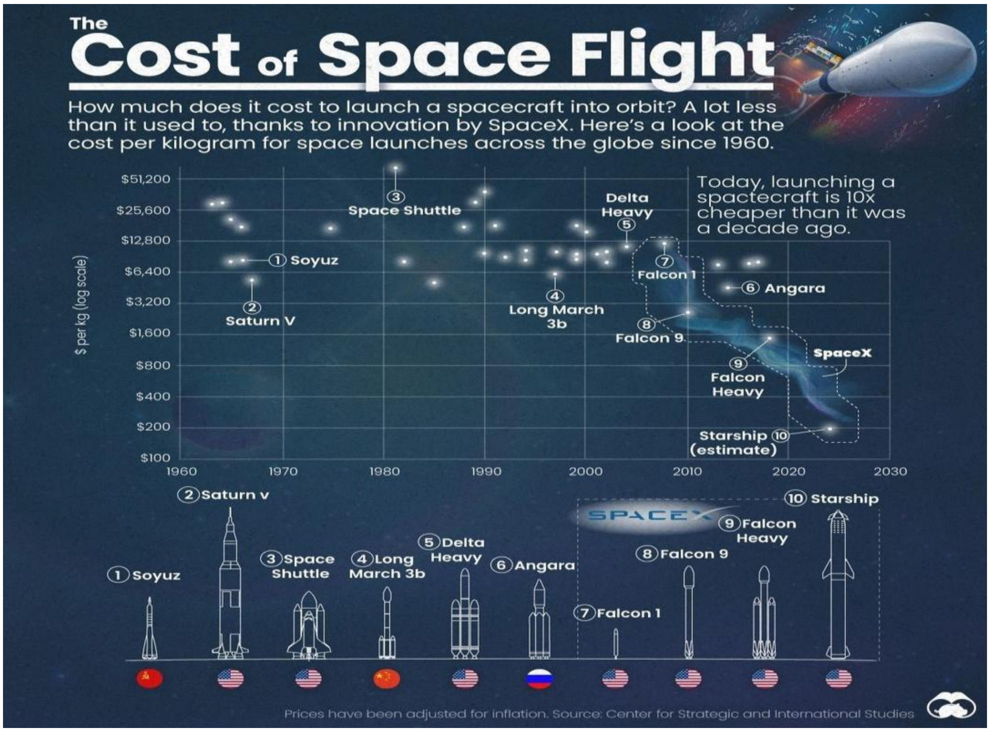
I found that the US holds the lead in both number of launches and number of space assets. While the US helps dozens of countries launch their space assets, this is negligible for China, with Egypt and Singapore (August 2022) having a few launches. Russia has assisted Iran (August 2022) and Angola (October 2022), also on a few occasions. India, on the other hand, receives orders from Switzerland (November 2022) and Singapore and the United Kingdom.

It is not possible to calculate the exact quantities of storage involved, but it is possible to conclude relatively that the US alone is putting several times as many space assets into space as the other countries combined. Nowadays, more and more countries are developing their capabilities in the field of rocket systems and more and more European countries are producing smaller rockets that can be used to launch payloads. So we can conclude that not only China and Russia, but also the US will face strong competition in the near future.

It is important to note that the launches indicated in this sub-chapter do not imply that China or Russia do not provide similar services or assistance to individual countries. China has launched the first spacecraft of Ecuador (NET24), Bolivia (NET25), Sudan (NET26), Etiopia (NET27), Laos (NET28), Venezuela (NET29), Pakistan (NET30), Hong Kong (NET31), and Russia, together with the Soviet Union, has launched spacecraft of India (NET32), Bulgaria (NET33), Nigeria (NET34), Iran (NET35), Algeria (NET36), Uruguay (NET37), Tunisia (NET38) not exhaustively listed. At the same time, Egypt's first satellite was sent beyond the atmosphere by France (NET39).

In fact, in order for all countries to offer similar starting conditions or for other countries to buy the service from them, they have to offer either cheaper and better or other discounts to the customer. Russia has lost many of its orders due to the current Russian-Ukrainian war, which have been in decline since 2010 due to the US independence. The expansion of the 'missile market' is more likely to bring economic competition in the near future, while political choices – e.g. communist, dictatorship sympathies – may also be involved in the selection process. The emergence of US commercial missiles has helped to make the world a much more affordable place to buy missiles today than even ten years ago. Costs are ten times less than they were a decade ago (NET40).

Figure 1: Changes in the Cost of Space Travel. Source: NET40



In addition to the above, Figure 1 shows that the reduction in costs not only brings economic benefits to the customer or service provider, but also gives countries the chance to launch their own space exploration, which they would not have been able to do on their own due to the high costs. Many countries can now devote their resources to space assets or other scientific research and can buy launch services, possibly from several providers, which require a higher level of capability. As shown in Figure 1, launch costs have fallen to the one hundredth part of a century between the 2000s and today.

Planetary defence

The most important, yet least analysed area is the protection of our planet Earth. The only event that can actually destroy humans is if the Earth or its eternal companion, the Moon, becomes a victim of a space disaster. The likelihood of this destructive event occurring is a given, since the lapse and birth of individual planets is a natural consequence of the processes that take place in space. The significance of the occurrence of a catastrophe is not the force of the catastrophe itself, but its relatively rapid occurrence. The impact of an asteroid or the physical activity of the Sun can happen relatively quickly, so the reaction time of humanity is necessarily delayed. The only solution is to prepare for the coming of a catastrophe, however small or remote. In this chapter of the publication I will discuss alliances, but there can be no doubt that a new approach to comprehensive alliance would be born if a destructive celestial body were heading towards Earth. The same can be said even in the case of a threat to the Moon, since the Earth's natural phenomena and the living conditions of mankind are completely exposed to the Moon's movements. Meanwhile, the threat is low, but the knowledge of the asteroid field between Mars and Jupiter could lead to a number of research results in the preparation for the event, which could be used in other areas of space activities.

In the Vienna Declaration (1999), the United Nations drew attention to the need for international cooperation in the field of near-Earth object detection and the need for concrete international cooperation in Part I./1.c/i-iii. (NET41) In year 2001, UN Action Team 14 made a proposal to address the threat of near-Earth object impacts, but a real response had to wait until 2013 (NET42), when the UN General Assembly, in its resolution 68/75, made provision for the obligation to observe space objects, exchange information, cooperate and reduce the threat (NET43). The real forerunner of planetary defense was the US. For the first time, Congress, under Article 321 of its 2005 Authorities Act, authorised NASA to carry out mandatory identification and tracking of Near Earth Objects (NEOs – NET44). The aim was clearly to avoid meteorite disasters and to eliminate safety concerns. In fact, this is a security risk for all countries, as a space disaster can leave any country vulnerable and defenceless against other countries.

The primary goal was to catalogue at least 90% of objects 140 metres or more by 2020. This was not achieved and the new target is 2028. The Planetary Defense Coordination Office (PDCO), established by NASA in 2016, expanded the range of celestial objects to be studied and now aims to track space objects (asteroids, comets) of 30 metres or more (NET45). In 2014, the UN Space Agency created two separate bodies, the International Asteroid Warning Network (IAWN – NET46) and the Space Mission Planning Advisory Group (SMPAG – NET47) which, according to their database, had detected a total of 31 414 asteroids in March 2023, of which 10 401 were above 140 metres and 853 were above 1 km. These include Potentially Hazardous Asteroids (PHAs) and a further 120 near-Earth comets (NET48). Despite numerous conflicts, these organisations bring together the major space-faring nations and other space-related organisations. This includes the US, Russia, China and ESA, which ensures that all major powers are equally involved and act together in planetary defence.

Russia and China are not yet directly involved in planetary defense, but both countries have plans for a possible emergency. Russia is considering its RS-28

Sarmat intercontinental ballistic missile, which can carry a nuclear warhead, as a solution (NET49). China's plan has long been similar, but they want to protect the planet without nuclear power, using around 20 missiles (NET50).

To date, mankind's only mission that involves action has been launched under the Double Asteroid Redirection Test (DART) programme, a collaboration between NASA, ESA, the Italian Space Agency (ASI) and the Japan Space Agency (JAXA). The aim of the experiment was to use kinetic energy to deflect the moon of the asteroid Dimorphos, named Didymos. The programme started on 24 November 2021 and was broadcast live on several news channels. I watched the impact on 26 September 2022 live as humanity's first deliberate intervention to change the orbit of a celestial body. megváltoztatására (NET51). Prior to that, in 2005, NASA's Deep Impact programme had collided a nearly 400 kg space object with the comet Tempel-1. At the time, the programme was only designed to study the structure of the celestial body. The possibility of deflection was first investigated in 2013 by NASA and ESA's Asteroid Impact and Deflection Assessment (AIDA) programme. The current DART programme is a 600 kg spacecraft that ended up crashing into the Dimorphos celestial body, interfering with the motion of the celestial body. It is planned that the consequences of the impact will be studied and observed at close range by the ESA-developed Hera spacecraft, to be launched in 2024 (NET52).

China has already announced in the first half of 2022 that it will launch a planetary defence experiment similar to the DART programme in 2025. The Chinese mission will differ from the DART programme in that the space assets to monitor the impact and its consequences will be delivered simultaneously (NET53). However, this experiment is not yet fully developed and the target itself has changed from the original plans. China – or any spacefaring country – has an interest in developing planetary defense capabilities so that it can protect its space station from possible orbital interference from celestial bodies.

Mining in Space

The acquisition and availability of mineral resources in a country is based on the mineral resources of many other countries. However, the discovery of space allows any country that is capable of space travel on its own to have access to a mineral surplus that gives it independence. Space is rich in metals, water and all known chemical elements, including rare earth elements. Helium-3, the future source of energy, is a rare element on Earth and is estimated to be found in quantities of 1 million tonnes on the Moon. Unlike nuclear fusion, helium-3 does not emit radioactive contamination despite the enormous energy released (Sipos, 2017, p. 75). Metals are needed to build spacecraft and other devices, and water is an essential additive to fuel our rockets (Wooten, 2018, p. 16).

Some minerals occur on the Moon's surface in greater quantities than on Earth. The Moon has significant metal reserves, and Helium-3 is also much more abundant than on Earth. Although rare earths are easier to extract on the Moon, the amount that would make it worthwhile to mine them has not yet been fully explored (NET54). As long as there is enough available and mineable material on Earth, mining on the Moon is not worth-while (McLeod & Krekeler, 2017, p. 19). However, asteroid mining is already promising. Among the mapped asteroids, there are 15,000 celestial bodies that are worth exploring and mining. NASA is currently monitoring 6,000 asteroids, and the 10 most economically mineable asteroids contain mineral resources worth a total of $1.5 trillion (NET55). Depending on the type, the asteroid contains a lot of rare earth metals and other metals, the amount of which on Earth is decreasing due to continuous extraction. However, asteroid mining will have to wait, as experts do not expect serious results until after 2045 (NET56). At the same time, the asteroid Psyche-16, located in the asteroid belt between Mars and Jupiter – NASA mission at the end of 2023 – alone contains so much gold, platinum and other mineral resources that it far exceeds the value of today's global economy (GDP 100,000 billion dollars – NET57). The asteroid Davida-511 – larger than 99% of asteroids (270 km in diameter) – is even several times this much, also located in the asteroid belt between Mars and Jupiter (NET58).

It is also noteworthy that private companies in the US and UK are currently conducting experiments to produce semiconductors in space. The basis of this is that microgravity and high-pressure vacuum allow for the production of much higher-level semiconductors. For now, the technical planning for transporting the materials there is still underway (NET59).

Space mining has not yet been implemented, but some countries have already responded to potential needs. The US, Luxembourg, Japan and the United Arab Emirates have already created the legal environment in which private companies can start (NET60). However, it is still a state option for now, since even the first steps would require too large a financial investment from a private company. The US, Russia, India, China and the ESA have so far declared their intention to achieve specific goals, but for now, NASA and the signatories of the Artemis Accord are closest to the implementation of real space mining. According to the agreement, they will adhere to previously established space agreements and principles, but the main goal is to ensure a human presence on the Moon, and to maintain a space station in orbit around the Moon and to establish a lunar base.(Deplano; The Artemis Accord: Evolution or Revolution in International Space Law, 2021, p. 799) Russia and China have also decided to establish a lunar base, similar to the Artemis agreement mentioned earlier, called the International Lunar Research Station (ILRS), and are currently trying to convince other countries to join (NET61). These programs aim to survey and extract the Moon's mineral reserves, among other goals, and involve both private and public actors. The implementation of lunar bases will allow for more detailed studies of celestial bodies in outer space and could serve as a new starting point for space exploration.

Space mining is not subject to separate uniform legal regulations in international practice. The above-mentioned countries regulate space mining within their national competence and the Artemis agreement and the ILRS are "only" intergovernmental agreements of the participating countries. At the same time, all parties are signatories to the 1967 Outer Space Treaty, which concerns the rules of activities in outer space. The 1979 Moon Treaty regulates the exploration of celestial bodies more specifically. While the former includes all space-capable countries (the launch of own vehicles into space), the latter is only attended by France and India among the space-capable countries. Article 1 of the Outer Space Treaty states that the exploration and use of outer space, including the Moon and other celestial bodies, shall be pursued for the benefit and interest of all countries, regardless of their level of economic or scientific development, and shall be considered a common undertaking of all mankind (NET62). Article 4 of the Moon Treaty uses the same wording with respect to the Moon (NET63). The two treaties also have similarities in that Article 2 of the Outer Space Treaty stipulates that no nation shall appropriate outer space, including the Moon and other celestial bodies, either by claim to sovereignty, by use or occupation, or by any other means. Article 11, paragraph 2, of the Moon Treaty uses the same wording with respect to the Moon. The Outer Space Treaty does not provide any further guidance on space mining, but the Moon Treaty does. The decision of countries not to be bound by the Moon Treaty was motivated by the fact that Article 11 of the Moon Treaty specifically states that the natural resources of the Moon are the common heritage of mankind and requires the establishment of an international system for the equitable distribution of mineral resources.

Safety in Outer Space and counterspace weapons

The world is dangerous and the behaviour of the countries in it is sometimes threatening. For nearly a century, humanity has been putting this danger and constant threat into space through space exploration. I have examined the military and social geopolitical factor and used as indicators the weapons that can be used in space and the environmental impact on space activities.

The formula "peaceful uses of outer space" used in Article 4 of the Outer Space Treaty, was put to the test before its entry into force in 1967. Following the launch and orbiting of Sputnik-1 (USSR) in 1957 and Explorer-1 (US) in 1958, only a few months of peace in space were granted. In May 1958, at the same time as the first results of space exploration, the US had already launched the Anti-Satellite Weapon (ASAT) tests, aimed at destroying threatening space assets of hostile countries (NET64).

ASAT weapons can be divided into two groups. On the one hand, kinetic energy weapons, which specifically destroy the target physically and for which any space-based device – whether a missile, drone or satellite – can be used as a weapon. On the other hand, non-kinetic energy weapons, such as cyber-attack, jamming or laser blinding devices (NET65). Such attacks can be launched from space, from the air or from ground-based devices.

US ASAT tests ended in success on 13 October 1959 when the Explorer-6 satellite was destroyed. Other countries have been working to develop a similar capability. Soviet Union succeeding in 1968, China in 2007 and India in 2019 (NET66). These countries have successfully destroyed their own satellites in low Earth orbit. Of course, many similar attempts have been made over the years and a treaty banning ASAT tests has still not been adopted. A resolution drafted by an UN working group and published on 1 November 2022 called on countries to ban all ASAT tests, but it is not legally binding (NET67).

Before proceeding with the analysis of space activity, we need to distinguish between danger and threat. By danger, I mean the severity of a given circumstance, while by threat, I mean the possibility of a given hazard occurring. The application of the Space Security Index (SSI) was developed by the Simons Foundation Canada and several universities – McGill University, George Wahsington University and the University of Adelaide – contributed to its compilation (West; Space Security, 2019, p. X-XVIII). On this basis, I have summarised the sources of risk in Table 3. The application and analysis of the index is thus a guide to making space safer, which can be achieved through continuous monitoring, thus reducing the risk of hazards.

In Table 3, the SSI index provides an answer to how to avoid in the future a threatening situation that could inevitably arise between countries based on the sharing of space. On this basis, continuous communication and transparency in the deployment of space assets, as well as clear rules from all countries, are essential to reduce the threats. Today the US clearly leads in this area as well, but its lead is in jeopardy (NET68).

In Table 4, I have analysed (with reference to the asset) the countries that are able to apply space technology in a more sophisticated way. These capabilities are called counter-space weapons, weapons capable of disrupting, weakening or destroying another's space technology in space or posing a high risk of another country freely using its own space technology in space. Such weapons include kinetic physical, non-kinetic physical, electronic and cyber technology weapons (Bingen et al., 2023, p. 3-32). The data in Table 4 show that the development of the countries' counter-space capabilities is ongoing. All the countries in Table 4 have set themselves the goal of having an anti-space weapon in the short term, but no progress has been made in the last two

Table 3: Danger in Outer Space. Source: NET82

Source of danger	Areas to be tracked
Knowledge and study of the space environment	Space junk. Allocation of radio frequencies and satellite orbits between countries. Natural disasters from space. Space situational awareness.
The use of space by global actors	Space assets deployed in space. Supporting the private space sector and assessing its needs. International cooperation and capacity coordination. Linking private and public space activities. Developing private and public cooperation. Monitoring of military space systems (dual used satellites).
Security of space systems	Electromagnetic and cyber security vulnerabilities. Increasing the resilience of space assets. Preference for developing ground capabilities rather than deploying in space. Oppose the deployment of ASAT systems in space.
Regulation and governance of space exploration	Establish national rules and strategies. UN to regulate space security.

Table 4: Counterspace weapons by country. Source: Space Threat Assessment 2023 – CSIS (Center for Strategic and International Studies; Bingen et al., 2023). Where there is no reliable data on the development of the capability or the weapon is under development, "not known or under development" is used, i.e. "n.k. or u.d."

Country	**Kinetic energy**	**Non–kinetic energy**	**Electronic technology**	**Cyber technology**	**Orbital altiude (NET69)**
US	NOTSNIK	CCS	CCS	Blue Skies	GEO
China	SC–19 ASAT	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	GEO
Russia	PL–19/Nudol	Sokol–Echelon	Tirada–2	SolarWinds	GEO
Iran	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	Pay2Key	Ground
North–Korea	n.k. or u.d.	n.k. or u.d.	Known	Bureau 121	Ground
India	Known	n.k. or u.d.	Samyukta	n.k. or u.d.	LEO
France	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	Known	Ground
Israel	n.k. or u.d.	Iron Beam	n.k. or u.d.	n.k. or u.d.	Ground
Japan	SM–3 rendszer	n.k. or u.d.	n.k. or u.d.	Known	Ground
South–Korea	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	Known	Ground
UK	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	X
Australia	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	Known	Ground
Germany	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	X
New Zealand	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	X
Canada	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	n.k. or u.d.	X

years. Most of all, the US and its allies must confront the threats from Iran, Russia, China and North Korea. Only Russia currently poses a real threat and danger to the US. (Harrison, Jophnson, Young, Wood, Goesler, 2022, pg. IV) However, the existence of these four types of anti-space weapons does not necessarily mean their military application, but they can be used to disturb the economic systems of other countries. This has been the case with North Korea and Iran, which have successfully launched electronic and cyber attacks against the state and civilian systems of other countries (Harrison, Jophnson, Young, Wood, Goesler, 2022, pg. 17 - 19).

Recognition of the threats in space is also demonstrated by the signing of the Combined Space Operations Vision 2031 by the US and its allies (UK, Germany, France, Canada, New Zealand and Australia) in 2022 (NET70). The document contains the main principles of previous international treaties, such as freedom of use of space, cooperation and the adoption of international rules. It mentions conflict prevention, sustainability and joint action as its objectives, while stressing the obligation to respect international treaties in the event of armed conflict. The document clearly foresees the development of capabilities that participating countries should have in order to counter a potential threat (NET71). The countries identified in Table 4 will necessarily have to take serious steps to develop the four anti-space weapons. At the same time, in UN Resolution A/RES/77/41, adopted in 2022, the UN called for an end to direct-to-target anti-satellite missile tests that would destroy the target and urged the adoption of preventive measures in the space environment and the extension of such measures in the future to prevent space weaponisation (NET72).

Global risks and the role of space activities in their reduction

In addition to analysing the threats and dangers in space, it is also necessary to analyse global risks. The World Economic Forum's survey takes stock of all the threats facing the world and just indirectly mentions the role of space. Let's look at the world's threats, in order of threat intensity, as collected by the World Economic Forum and looking ahead 10 years (NET73).

Table 5 shows that natural hazards are the most feared in the world. The space-related area is directly related to point 8 under "Cross-border cybercrime and cyber insecurity". As noted by Philippe Rosius (EUSPA, EU Agency for the Space Programme, Head of Galileo Security Monitoring Centre, EU Space Programme Agency, Galileo Security Monitoring System) at the 15th EU Space Forum Conference, 23-25 January 2023, in its Working Group 17, 95% of space security is cyber-security. Of course, we encounter space indirectly through the other threats.

If we look at the indirect side of the last sentence, the role of space activity for hu-

Table 5: Dangers of our world in 2023. Source NET73

n	Short term (1–3 years)	Long term (10 years)
1.	The cost of living	Failure to mitigate the impacts of climate change
2.	Natural disasters and extreme weather	Adapting to climate change
3.	Global economic conflicts	Natural disasters and extreme weather
4.	Failure to mitigate the impacts of climate change	Collapse of the environment and biodiversity
5.	Social decline and fragmentation	High migration pressures
6.	Large-scale environmental disasters	Lack of natural resources
7.	Adapting to climate change	Social decline and fragmentation
8.	Cross-border cybercrime and cyber insecurity	Cross-border cybercrime and cyber insecurity
9.	Lack of natural resources	World economic conflicts
10.	Large-scale migratory pressures	Large-scale environmental disasters
11.	Debt crisis	Misinformation and lack of information
12.	Lack of stable exchange rate levels	Ineffectiveness of international institutions and international cooperation
13.	Continued economic decline	International conflicts
14.	International conflicts	Debt crisis
15.	Ineffectiveness of international institutions and international cooperation	Cost of living
16.	False information or lack of information	Destruction of critical infrastructure
17.	Systemic industrial Collapse of key industrial centers and supply chains	Concentration of digital power
18:	Collapse of the environment and biodiversity	Adverse outcome of frontier technologies
19.	Unemployment crisis	Lack of stable exchange rate levels
20.	Infectious diseases	Chronic diseases and health problems
21.	Use of weapons of mass destruction	Continued economic decline
22.	Bursting of economic bubbles	State collapse or severe instability
23.	Severe mental disorders	Unemployment crisis
24.	Shutdown of critical infrastructure	Collapse of systemic industrial and supply chains
25.	State collapse or severe instability	Severe mental health crisis
26.	Chronic diseases and health problems	Lack or collapse of community infrastructures and services
27.	Lack or collapse of community infrastructures and services	Communicable diseases
28.	Rise of illicit economic activities	Use of weapons of mass destruction
29.	Concentration of digital power	Rise in illicit economic activities
30.	Terrorist attacks	Digital inequality and lack of access to digital services
31.	Digital inequality and lack of access to digital services	Bursting of economic bubbles
32.	Adverse outcomes of frontier technologies	Terrorist attack

manity changes and the focus is on protecting the environment of nature on Earth. By analysing global risks, we identify natural and social problems that require the coordinated international application of space technology to solve them.

120 years have passed since Nils Gustaf Ekholm coined the term "greenhouse effect"(NET74 – Vitruvius, in his ancient writings, analysed climatic data to select the land needed to build civil houses) but it was only in the first half of the 20th century that mankind reached the technological level of studying the atmosphere and it was only thanks to the rocket technology developed during World War II that it was possible to take photographs

of the atmosphere around the Earth. In the course of decades, (space) technology has reached the stage where it is capable of causing major damage to the environment and breaking the integrity of nature.

The tools developed in space activities can protect or even harm nature – and through it society – directly or indirectly. Rocket systems and satellite systems can help in the exploration of space, but they can also pose a threat to space objects and the Earth. Their regulation and international coordination are essential.

The rocket systems created and deployed in space activities are needed to place space assets in orbit around the Earth, where we can observe our planet more closely. Only in this way will humanity be able to study ecological processes, the atmosphere, oceans and continents in greater scientific detail. Preventing or mitigating the main threats listed above, and in particular taking climate protection measures, is inconceivable without the effective use of space assets. At the same time, these space assets are themselves a source of environmental hazards. The Outer Space Treaty recognises the principle that space is 'in the common interest of mankind' and prohibits in its Article 4 the deployment or testing of nuclear or similar weapons in outer space. At the same time, also in Article 4 and in the Preamble to the Moon Agreement, the prohibition of the militarisation of the Moon and other celestial bodies is also laid down, i.e. the establishment of military bases or other military installations on the Moon or on spacecraft in orbit around the Earth (NET75).

Articles 1 and 21 of the Liability Convention take into account the link between the space asset and the damage it causes, should also be highlighted. Since the entry into force of the Convention in 1972, a number of space objects have returned to Earth and posed a threat to the environment or human health. However, the application of the provisions of the Convention has so far only arisen in one case. Cosmos 954 entered Earth's atmosphere on 24 January 1978 and crashed into Canadian territory, contaminating the area and causing hundreds of kilometres of damage over a distance of several hundred kilometres. The Soviet and Canadian governments agreed to pay for the damage, and the case was closed (NET76).

The solution lies in the sustainability and continuous development of space activities. Sustainability as sustainable development rests on three pillars: environmental, economic and social. (F. Ekardt, 2020, pg. 27–28) The concept of sustainability was first used by Hans Carl von Carlowitz in the field of forestry.(F. Ekardt, 2020, pp. 27-28 – Sustainable development implies development where the needs of the present meet the needs of future generations without compromising). Although the most threatening of the dangers listed in Table 5 are climate change and other natural disasters, there is a lack of international regulation. Nowadays developed and emerging countries do not want to lose the benefits of space capabilities, necessarily even at the cost of environmental damage. Countries are clearly struggling to come to terms with the issue of space exploration, which is a transnational issue that is unlikely to be resolved bilaterally. There is therefore a need to find an organisation that brings together the interests of individual countries while representing environmental values. At present, this can only be done within the UN framework, but the lack of binding compliance with its resolutions does not make it a complete intergovernmental organisation to play a supranational role.

In 1997, the UN General Assembly, in its resolution A/RES/51/122, established the Declaration on International Cooperation in the Exploration and Exploitation of Outer Space in the Interest of All Countries, Particularly Developing Countries' Needs. (NET77) The Declaration underlines that outer space is a peaceful area of common interest and value, and that access should be freely granted to all and national and international governmental and non-governmental bodies should be established, in accordance, of course, with the international law in force at the time.

The next milestone was also adopted by the UN General Assembly in 2013. Resolution A/RES/68/74 set out the recommendations to the National Legislatures for the Peaceful Exploration and Exploitation of Outer Space. (NET78) On this basis, the instrument gives a prominent role to States in the exploration of outer space and encourages countries to enact legislation within national competence in accordance with domestic interests. The resolution mentions the responsibility of countries in legislation, which imposes rights and obligations on all members, whether they participate in space activities individually or jointly with other countries, in whole or in part.

This was followed in 2015 by the Paris Agreement on Climate Change. (NET79) The Convention sets out a number of commitments in the text to reduce greenhouse gases. In Article 9, it highlights the obligation for countries to cooperate and to share the information they obtain. Article 2 expects the strengthening of communication between developed and emerging countries, and Article 10 and Article 20 state that technological and economic development should be used to improve cooperation between countries. Reducing greenhouse gases requires an adequate and comprehensive response and a high level of cooperation.

Prior to the adoption of the Paris Agreement, but also in 2015, the UN General Assembly adopted the 2030 Agenda for Sustainable Development, which is based on a set of 17 Sustainable Development Goals (SDGs). (NET80) Subsequently, in 2021, the UN General Assembly adopted the 'Space2030 Agenda', entitled 'Space as a driver of sustainable developement', by resolution A/RES/76/3. The basic idea behind the wording is that space assets are essential to achieve the commitments made in the Paris Agreement. The Assembly has clearly set out a path where sustainability and climate protection will be inseparable in the future. Throughout, the resolution consistently refers to 'long-term' sustainability, a term used to further enhance the emphasis on sustainability. The international cooperation and the development of bilateral and multilateral relations, which have been recognised in previous legislation, are essential foundations for this. Of course, cooperation requires mutual recognition of institutions by each country and the collection and sharing of information on space activities.

The previously defined definition of sustainability is now complemented and defines the definition of long-term sustainability in space. The concept was presented at the World Space Forum, organised by the United Nations Office for Outer Space Affairs on 13-15 December 2022.

"…the long term sustainability of space activities (on ground an in orbit) is defined as the ability to maintain and improve the conduct of space activities indefinitely into the future in a manner that ensures continued access to the benefits of the exploration and use of space for peaceful purposes, in order to meet the needs of the present generations while preserving both the Earth and the outer space environment for future generations. Space sustainability also req uires the promotion of the use and environmental benefits of space data and recognizing the need for launch and in orbit activities to be carried out in responsible and sustainable manner."

It would perhaps be simpler – and shorter – to use the concept established centuries ago in general terms, from Immanuel Kant, who said 'Let us create institutions that can serve our successors ', or Friedrich Nietsche, who said 'We do not only desire things themselves, but also their recurrence'.

The long-term sustainability formula, like the Paris Agreement, is also at the heart of the definition of space sustainability, based on a study published by the UN Committee on the Peaceful Uses of Outer Space (thereafter COPUOS) in 2021. However, the Guidelines for long-term sustainability of outer space activities of the committee on the peaceful uses of outer space (hereinafter 'the Guidelines' – NET81) issued by the COPUOS, are not legally binding and countries can decide voluntarily to apply them. The intention of the body is clearly to facilitate legal harmonisation between countries, once all Member States have completed the process of creating their own domestic legislation. The Guidelines are the latest and most comprehensive UN document in the field of space. At the same time, the compilation of the areas covered by the Guidelines started in the 2010s and continued until 2018. 21 Guidelines have been identified, divided into four areas: (1) defining a space framework of rules and regulations, (2) ensuring safety and security in space activities, (3) international cooperation, resource building and awareness, (4) scientific and technological research and development. An analysis of the areas covered by the Guidelines shows that the aim of the legislation is to promote the long-term sustainability of the environment and society, as is clearly stated in its name.

Findings

As discussed in this paper, it can also be concluded that alliance systems have a strong influence on the development of future alliances in the field of space activities, while many countries may reconsider their alliance strategy depending on the desired outcomes in space. If individual countries wish to make progress in space, they can choose from only a few countries to help them, which can strengthen the main alliances and reduce their absolute number. This choice must be accompanied by competition and political choices.

Given that the technology involved is advanced, the maintenance and operation of the equipment requires a complex approach on the part of both the customer and the country providing it. This leads me to the conclusion that cooperation in bilateral relations between countries can depend to a large extent on the quality of space activities. If a country is capable of development, it is worth establishing relations with the country that can deliver the best quality, regardless of the influence of the state system. At the same time, only the US and its federal system have the autonomous capacity to offer the highest quality to other countries. China and Russia have weaker alliance systems in space activities, which could result in a lagging space policy or potentially in serious geopolitical conflicts. Many countries are covertly seeking to use space achievements to maintain the threat of other countries. Thus, steps taken in space exploration cannot be so peaceful as to be seen solely as scientific progress. The role of the anti-space weapons under analysis is creating competition between countries in a similar way to that seen between the Soviet Union and the USA in the development of the atomic bomb in the 20th century.

Russia and China are trying to act as a counter-pole, but the major space-capable countries have already pledged their allegiance to the Artemis Accord and are trying to build their own alliance through a new treaty. The implementation of the two agreements will probably bring the most exciting competition in the coming decades

In analysing the main threats and risks, I have concluded that without space activities, these areas cannot be properly developed and applied today. The overall functioning of the United Nations suggests that it has been possible to bring countries together and to move a slice of space activity towards climate protection and, through this, to maintain the international community's respect for each other, in cooperation.

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