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SPACE POLICY AND SECURITY: CHANGES AND CONTINUITIES IN THE SECOND AGE

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ABSTRACT

The present article investigates the space policy related to space security. The objective is to identify changes and continuities between the First (1957-1991) and the Second Space Era (1991-?). From the methodological point of view, the investigation consists of a bibliographic review and a documentary analysis. The paper has two parts: the first reconstructs the space race that occurred during the Cold War, while the second investigates the contemporary dynamics of space security. As final considerations, it was possible to observe continuity in the strategic use of outer space. There are two changes. The first concerns the growing importance of artificial satellites, both from military and economic aspects. The second refers to the plurality of new space actors, which increases the complexity of the interactions and can contribute to the conflict.

Keywords: Space. Security. Artificial Satellites. Militarization.

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INTRODUCTION

In 2019, the United States (U.S.) announced the implementation of a military structure focused on outer space, consisting of the U.S. Space Force (USSF) and the U.S. Space Command (USSPACECOM). As a result, discussions about the strategic function of space policy gained momentum in the international arena. The conception of a security dimension to outer space is not new, having its origins in the "First Space Age" (1957 to 1991), a period when the U.S. and the Soviet Union (USSR) fought a race for dominance in this area. After the end of the Cold War, a "Second Space Age" began (from 1991 to the present day), which introduces different interactions related to space exploration, mainly due to the presence of new actors, increasing its complexity. Thus, it is important to analyze how the security dynamics have occurred in this new context, comparing them with previous experiences.

This article aims to investigate the space policy related to the area of security (space security), to identify the main flows of changes and continuities between the First and Second Era. From a methodological point of view, the research consists of a literature review and a documentary analysis. Research in the areas of Space Law and Policy, Space Security and History of Space Exploration are the main bibliographic sources. The documentary sources focus on official documents of States, especially in the area of security, and international instruments.

The paper comprises into two parts. It begins with an analysis of the First Space Age, reconstituting the facts related to the beginning of space exploration and the use of these resources for strategic purposes. Then, we investigate the Second Space Age, presenting the main actors and the current security dynamics in the area, as well as discussing the repercussions of militarization and weaponization[3] processes in the international scenario.

1 THE FIRST SPACE AGE (1957-1991)

The first steps leading to the beginning of outer space exploration happened during World War II, when Nazi Germany developed and built

[3] The word weaponization is a neologism, meaning the process of transforming a given medium or object into a weapon. Here, it is as an extension of the mere military use of space, implying the placement of warlike devices, offensive and defensive.

the "V-2" ballistic missile, based on a liquid fuel rocket. It was capable of high altitude and speed, and contained a considerable load of explosives, making it a feared weapon in the last years of the conflict (1944-1945). Although not the initial objective, the technology developed in the project clearly made it possible to send objects and vehicles into outer space (CADBURY, 2007).

Impressed by the results, the USA and USSR started to covet it, with the objective of producing in their territory a similar weapon. In 1945, the U.S. launched a secret operation to find and recruit scientists and engineers working in the Nazi military-industrial complex, especially in the "V-2" project. Soon after the American action, the USSR proceeded in a similar manner, succeeding in also recruiting a German technical staff (DAWSON, 2017, p. 119).

In 1945, the United States began studies on the possibility of creating and launching an artificial satellite capable of orbiting the earth and fulfilling military objectives, such as increasing communication, weather forecasting, and defining targets on the battlefield (PEEBLES, 1997, p. 01). In the early 1950s, the international scientific community planned the establishment of a major cooperative project aimed at understanding the physical and geological phenomena of the earth, called the "International Geophysical Year" (IGY), between the years 1957-1958. Researchers from the USA and USSR participated. In 1955, the USA announced its intention to launch an artificial satellite during the IGY.

Within the United States, it was agreed that the project would be disseminated with a scientific and peaceful purpose, since it was not yet known how the Soviets would react to having a foreign object (and a rival) flying over their territory. One of the objectives was to consolidate the legal idea of freedom of movement in outer space, analogous to that which exists on the seas. This would help establish a legal basis for future launches, and divert the focus of public opinion away from the military spy satellite projects that were secretly under development (PEEBLES, 1997).

In practice, however, the program to launch the first American satellite suffered from low investment and lack of coordination between different parallel initiatives, fragmented among the three armed forces, which damaged the project. In the final stretch, the Navy initiative (called Vanguard) gained priority, especially because it contained strong civilian

participation, reinforcing the image that the US was trying to spread (SHEEHAN, 2007, p. 37-39).

Unlike the US, which was able to project its air power into enemy territory without great difficulties, the USSR lacked the means to use its atomic weaponry against its rival, since its aircraft were obsolete (BRZEZINSKI, 2007). Such a condition placed the development of long-range missiles as a top priority among the Soviets. In the following years, Soviet engineers were able to reproduce and perfect the German V-2 ingenuity, culminating in the development of the first intercontinental ballistic missile, the "R-7" (SHEEHAN, 2007).

The U.S. announcement in 1955 encouraged the USSR to develop its own satellite, which would have with the same technology used by the R-7. Suffering from internal and external political pressures, the Khrushchev government saw the space project as the ideal opportunity to deflect criticism and contribute to the consolidation of a positive agenda for the country. Its objectives were to publicize the communist model as being technological, different from the U.S. view that saw it as backward, and to demonstrate the reach of the intercontinental ballistic missile, because if it was capable of putting a satellite in orbit, it could easily reach U.S. territory (SHEEHAN, 2007).

To achieve their goal more quickly, the Soviets chose to reduce the complexity of the initial design and launch a lighter, simpler satellite. On October 4, 1957, Sputnik 1 was launched, the first artificial satellite to orbit the earth. The Soviet feat stunned the US, especially since the act posed a threat to its security (DAWSON, 2017).

Despite the attempt by Eisenhower's government to minimize the achievement, there was great criticism from public opinion and part of the legislative power, which started to promote a series of hearings to investigate a possible inoperability in the space area (CADBURY, 2007). While the U.S. still assimilated the situation, on November 3rd, 1957, a new surprise occurred: the Soviets launched Sputnik 2, this time with the first living being to ever enter the Earth orbit, the dog Laika.

In response to the Soviet action, the U.S. government undertook a major reorganization of its space policy. After the failure of the first attempt with the Navy's Vanguard, the U.S. reactivated the Army's alternative project, known as Redstone. As a result, in January 1958, the U.S. finally succeeded in launching its satellite (Explorer I). Two months later it was the turn of Vanguard I, the first solar-powered satellite.

In February 1958, the US government founded the Defense Advanced Research Projects Agency (DARPA). One of its initial objectives was to research military space technologies. In July 1958, a civilian government agency responsible for developing the space exploration program was created, the National Aeronautics and Space Administration (NASA). Project Mercury (1958-1963) then began, with the purpose of launching manned space missions.

Several reasons exist for the creation of a program of a civilian nature in the U.S. Among them, to avoid the prominence of one of the branches of the armed forces in the space area, which could generate an inter-institutional conflict; to mitigate competition between the space program and the development of missiles and other defense technologies, as occurred internally in military institutions; to emphasize its peaceful and scientific character, reducing resistance in the international arena.

It is worth stressing that, despite NASA's prominence in later years, DARPA, military institutions, and even intelligence agencies such as the CIA continued to conduct their own space research, often of a secret nature. In-depth detail on these projects is only possible from the deconfidentialization of the information, which usually occurs after decades. This is the case with the launching of "reconnaissance satellites" (or "spies"). The CIA and the US Air Force conceived the Project CORONA as a series of such satellites launched in the late 1950s, whose mission was to periodically photograph enemy territory to compose intelligence information (PEEBLES, 1997).

With the growing tension between the two countries in the space area, the United Nations (UN) began to advocate the need to discuss the problem in a multilateral environment. In December 1958, the countries gathered in the General Assembly of the United Nations Organization (UNO) prepared a resolution recognizing that outer space is a global space system should be used for peaceful purposes. In this context, the Committee on the Peaceful Uses of Outer Space (COPUOS) was created, initially on a temporary (ad hoc) basis, with the participation of 18 States, among them Brazil. In 1959, COPUOS became permanent, becoming the main international forum for discussion, negotiation, and cooperation in space matters. Its decisions are made by consensus.

The establishment of the United Nations Office for Outer Space Affairs (UNOOSA) in the following years had the objective of providing secretariat for the COPUOS activities and assisting in the implementation

of its decisions. Two subcommittees were also created: the Scientific and Technical Subcommittee and the Legal Subcommittee. Its headquarters are in Vienna, Austria.

In the following years, the USA and USSR continued the dispute, seeking, at each step, to overcome the rival. On April 12, 1961, the Soviets launched the first man into space, Yuri Gagarin, by means of a modified R-7 (called Vostok), frustrating American expectations of being pioneers in the area. Expanding its space technology, the USSR carried out a series of actions, which included launching probes to the Moon, developing its own spy satellites (known as Zenit), extending the orbit time for manned missions, increasing the crew in the modules (tests with two and three occupants), and the first extra-vehicular activity in space ("space walk").

Despite efforts to catch up with the Soviets, there was a common perception that the US was losing the contest. However, a new political scenario contributed positively. In May 1961, newly elected President John F. Kennedy in a speech to the US Congress announced the project to land a man on the Moon and bring him back safely by the end of the decade. In practice, during the Kennedy (1961-1963) and Lyndon Johnson (1963-1969) administrations, there was a significant increase in NASA's annual budget and the creation of two major projects.

The main objective of Project Gemini (1961-1966) was to test new space technologies and gain the necessary expertise that the Americans needed for the lunar trip, which included, for example, investing in systems that would allow the duration of space missions to be increased, observe the effects of weightlessness on the human body, and perfect docking and landing mechanisms.

It was a "rehearsal" for Project Apollo (1961-1972), whose purpose was to send a manned mission to the moon. The Soviets, in turn, were developing their own program, conducting tests and improving their launch vehicles, which gave rise to the Soyuz model, in 1966.

Parallel to the space race, the first results of a possible international regulation of outer space exploration emerged. In August 1963, the U.S. and USSR signed a treaty containing a series of prohibitions on the testing of nuclear weapons, which also included a ban on testing in space (the Partial Nuclear Test Ban Treaty). On December 13, 1963, the UN General Assembly adopted the "Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space. From the

discussions held at COPUOS, negotiations began for the creation of the first international treaty on the subject.

Finally, on January 27, 1967, the "Treaty on Principles Governing the Activities of States in the Exploration and Use of Cosmic Space Including the Moon and Other Celestial Bodies" was signed, which became better known as the "Space Treaty". It came into force in October 1967 and has wide adherence on the international scene. It became a true landmark in the history of space exploration, gaining strength among the international community, as a kind of "Space Magna Carta", in analogy to constitutional documents. It is possible to identify a consensus around the merit and value of the Space Treaty regime among nations, constituting it as the starting point for the study and analysis of space security dynamics (HAYS, 2015).

The document provides a series of general rules on space activity, with the objective of mitigating possible conflicts and ensuring international cooperation. Among them, the exploration and use of space must be carried out for the benefit and in the interests of all humankind (art. 1 space shall not be subject to national appropriation (art. 2, "non-appropriation clause"); mandatory provision of assistance to astronauts in case of accident, danger or forced landing (art. 5, "astronauts as envoys of humanity"); general clauses on state liability in case of damage caused by space objects (arts. 6 and 7, "principles of liability"). It also defines jurisdiction and control (art. 8); the need for cooperation and mutual assistance (art. 9, "principle of cooperation and mutual assistance").

In the field of security, we outlined the Article 4 of the Treaty, which prohibits the placement of nuclear weapons and weapons of mass destruction in Earth orbit, on celestial bodies, including the Moon, and in space in general. The same device prohibits the establishment of military bases, facilities, or fortifications, the testing of weapons of any kind, and the execution of military maneuvers on celestial bodies. In Dolman's (2005, p. 07) view, the international legal efforts would not represent genuine cooperation based on universalism, but a result of Cold War realism, which sought to contain military advances and prevent the escalation of a conflict between the two rivals of the time.

In the race for the first manned mission to the moon, there was a wide disparity between the powers, which placed the Americans as the winners of the biggest prize of all. The Apollo Program had its basis on the Saturn V, which showed a high degree of reliability in testing. The

Soviet initiative (based on the new N1 rocket) suffered successive failures, exploding after several attempts. After years of tests and trials, on July 20, 1969, the Apollo 11 crew reached their goal, and American Neil Armstrong became the first man to set foot on the moon. Five other successful moon missions followed in later years (Apollo 12, 14, 15, 16 and 17).

Away from the media spotlight of the lunar programs, a number of strategic research projects were undergoing in the area of security. Such projects included the development of a spacecraft for military missions such as reconnaissance, bombing, space rescue, satellite maintenance, and sabotage of enemy satellites (the X-20 Dyna-Soar project) and an orbital space station (called the Manned Orbit Laboratory - MOL). The expansion and technological improvement of intelligence satellites eventually supplanted these initiatives, due to the high costs, as they operated without the need for a crew, a factor that meant additional risks. The National Reconnaissance Office (NRO), a hybrid civil-military agency whose existence remained secret for more than 30 years, conducted the administration of the satellites.

During the 1970s, because of the recession and the public's lack of interest in space exploration, the US and USSR substantially modified their programs. NASA suffered budget cuts and began to seek alternatives. The USSR, in turn, proved incapable of reducing the technological gap and eventually gave up on lunar travel. The Soviets concentrated on other projects, which included

the launching of probes to Mars and Venus, and the development of the first space station (Salyut) in 1971[4]. In response, the Americans launched their space station (Skylab) in 1974. An outstanding fact of the period was the realization, in 1975, of the first international space mission, the Apollo-Soyuz project. This initiative, symbolic in nature, represented a brief moment of decreasing tensions between the US and USSR.

In the same period, the Global Positioning System (GPS), one of the most successful military space, started in the USA. Through the operation of a set of 24 satellites in orbit, the system allows an electronic receiver to receive information about its positioning. Initially conceived to increase the precision of ballistic missiles, it has become indispensable for the movement and positioning of military forces. In later decades, the service became widely used in the civilian sphere, with different applications.

[4] The USSR launched seven Salyut stations, three of which secretly developed military reconnaissance and surveillance missions (Almaz Program).

The period between 1968 and 1979 was fruitful in the elaboration of new international norms in the scope of COPUOS, to detail and extend the provisions of the Space Treaty. Thus, four international treaties were created, "Agreement on the Rescue of Astronauts and the Return of Astronauts and Objects Launched into Cosmic Space" of April 28, 1968, "Convention on International Liability for Damage Caused by Space Objects" of March 29, 1972, and "Convention Relating to the Registration of Objects Launched into Cosmic Space" of November 12, 1974. Lastly, the "Agreement Regulating the Activities of States on the Moon and on Other Celestial Bodies" of December 5, 1979, known as the "Moon Treaty." The Treaties were massively ratified, with the exception of the latter, which was not adhered to by the space powers due to disagreements about the sharing of resources and/or because they considered it was already diluted in the text of the other treaties, a position led by the USA. It is important to point out here that Brazil is also not a signatory of the Agreement for reasons not explained in COPUOS.

Against the backdrop of prolonged austerity during the 1980s, the US began to conduct research into the creation of a reusable space vehicle.

Following a period of testing, 1981 marked the launch of the first Space Shuttle. Its periodic missions included conducting scientific research, military missions, and putting satellites into orbit. Another way to reduce costs was to seek international partners, as was the case with the Freedom Space Station project, with the participation of Japan, Canada, and European countries.

In the field of space security, the US government has sought to restructure the military aspects of the use of space and to develop new projects. In 1982, the USA created the Space Command (later called the Air Force Space Command - AFSPC), a part of the United States Air Force (USAF), with the objective of developing military space resources (such as communications, surveillance, and intelligence). The Navy Space Command (NSC, 1983) and the Army Space Command (ARSPACE, 1988) were also organized.

In 1985, the United States Space Command (USSPACECOM) was created to coordinate, under a unified combatant command, the space operations carried out by the different branches of the armed forces. In practice, the AFSPC, NSC, and ARSPACE were responsible for organizing, training, and equipping military capabilities in the space area (preparation), while USSPACECOM operationalized and executed the

missions (employment), such as, for example, the launching of military satellites, the control of these artifacts, and the monitoring of the space environment.

One military space project that gained prominence at the time was the Strategic Defense Initiative (SDI), also known as "Star Wars." It consisted of establishing a space-based ballistic missile tracking and destruction system. Due to the very high cost involved, the initiative never got off the ground.

During the 1980s, despite the growing political and economic crisis it faced, the USSR maintained a series of strategic space projects. In 1986, Mir was launched, a permanent space station created with the goal of conducting experiments that would allow for long-duration space travel in the future. In the military field, the Soviets sought to develop mechanisms aimed at incapacitating the U.S. SDI. The Polyus was a stealth vehicle equipped with laser cannon capable of attacking enemy satellites, while the Buran was a replica of the American space shuttle with extended military capabilities.

The Soviet space program and space race ended with the collapse of the USSR in 1991, marking the end of an Era. Looking back on the period between 1957 and 1991, it is possible to say that it was the Cold War power struggle that encouraged the US and USSR to move forward in space exploration. Prevented from pursuing a nuclear war (which would have meant mutual annihilation), the space race became the ideal substitute to prove their superiority (SHEEHAN, 2007), seeking to expand international prestige and expand military capabilities.

Although there was room for international normalization and cooperation, capable of restricting certain behaviors (through COPUOS and international treaties), strategic and military objectives played a central role in the dispute between the two powers. Space exploration, in the period, was never an exclusively civilian endeavor. It is possible to identify the active participation of the Armed Forces in several projects and in the development of space technologies with military applications, such as, for example, the improvement of ballistic missiles, the creation of spy satellites, and the development of geopositioning systems.

2 THE SECOND SPACE AGE (1991-?)

With the end of the USSR and the bipolar world, there was a feeling that a new era of undisputed American hegemony and international cooperation was beginning (FUKUYAMA, 1993; HUNTINGTON, 1999). In the following years, there was the emergence of several power poles that started to dispute their place in space exploration. Thus, from 1991 on, there would be a "Second Space Age" (HAYS; LUTES, 2007, p. 207), with defined characteristics. First, it is possible to observe an increasing economic and strategic exploitation of space resources, mainly in the region that comprises the Earth's orbit and with the use of artificial satellites. Second, a plurality of actors carries out this exploitation, including private actors.

Since the end of the Cold War, the use of artificial satellites orbiting the Earth has gained great importance for contemporary life. Its relevance lies in the production and availability of information, with economic and strategic value, in different applications. Its benefits appear in telecommunications, monitoring environmental changes, prospecting natural resources, meteorology, and dealing with disasters.

In the security context, artificial satellites have become indispensable. They are instrumental in intelligence, surveillance, target acquisition, and reconnaissance operations; maintaining exclusively military communication and data transmission channels; geopositioning of troops, ground vehicles, vessels and military aircraft, including unmanned devices. Contemporary warfare is increasingly dependent on satellite resources.

It is common to use satellites in a dual manner, with simultaneous civil and military functions (MOLTZ, 2014). An example is the constellation of satellites that form the GPS, mentioned earlier. In addition to its use by the military, it is possible to identify its application in urban mobility mechanisms, aviation, digital services, and agribusiness. The economic and strategic importance of geopositioning satellites has compelled other countries to invest in their own systems such as the Russian GLONASS, the European Galileo, the Chinese BeiDou, and the Indian IRNSS.

In recent decades, dozens of countries have developed their own space programs and agencies. Some began their activities during the First Era, but greater autonomy and visibility only came with the beginning of the new space cycle. Others are still very rudimentary or in the early stages, representing more of a political agenda than a consolidated program.

As of March 2020, there were 2,666 satellites orbiting the Earth registered, most of them maintained by the US. Today, several countries are capable of building and operating their own satellites, either alone or in cooperation with other nations. However, the maturity of a space program has been measured not by the ability to build and operate space artifacts, but by having national technology to launch objects ("launch vehicles"), which guarantees total independence. In addition to the U.S. and Russia (heir to the USSR), China, Japan, India, Israel, Ukraine, Iran, North Korea, and the European Space Agency (ESA) have their own launch vehicles. Another milestone is the mastery of the complete space cycle, which includes the possibility of carrying out manned missions, a capability currently demonstrated only by the US, Russia, and China.

An important feature of the new space age is the increased participation of private actors. Once dependent almost exclusively on public investment, space exploration has gained new impetus with the entry of private capital and the creation of partnerships between governments and companies. By 2020, the space economy represented a $366 billion industry, which certainly attracts private capital. In addition to the satellite industry (corresponding to $271 billion in the space economy), new forms of commercial exploitation are already being considered, which include transporting cargo and astronauts into space, suborbital flight, space tourism, and mining of celestial bodies (EIS, 2020).

The US began the Second Space Age by betting on international cooperation. During the Clinton administration, the Americans resumed the project of building a permanent space station orbiting the Earth. In addition to the original partners (Canada, ESA, and Japan), the US invited Russia, which led to the signing of the agreement to create the International Space Station (ISS), launched in November 1998. It thus became the largest collaborative project between the two former rivals. The ISS remains active to this day, continuously inhabited for almost 20 years. It is expected to cease operation in 2024.

When it comes to conducting manned space missions, the US remained until 2011 using the space shuttle. The two serious accidents (with Challenger in 1986 and Columbia in 2003) and the high costs involved led the Americans to discontinue the project. This does not mean, however, that it was a failure. The large number of missions performed (135 in all), its capacity to place and maintain satellites, and its participation in the transportation and assembly of the ISS proves otherwise. Ironically, after

the period, the US began to rely on Russian launches to send its astronauts to the ISS (DAWSON, 2017).

To reduce public spending, in addition to the difficulty of approving a budget in the U.S. Congress that contemplates new projects, the U.S. preferred to delegate to private enterprise the development of new launch vehicles and cargo transportation (Commercial Crew Program). In 2020, the first manned transport to the ISS was performed using a spacecraft designed, built, and controlled by a private company (SpaceX), characterized as a milestone for space exploration (DAWSON, 2017). In the coming years, the US intends to launch a new mission to the Moon, in partnership with other states and private actors (Artemis Program).

Russia, the heir to the Soviet legacy, remains an important space power despite the economic and political structural changes that the country has undergone in recent decades. Through its space agency (Roscosmos), besides actively participating in ISS launches and administration, it has plans to create a new space station and to carry out missions to the Moon.

China began its space program with the goal of expanding the country's military capabilities in the area of ballistic missiles, inspired by American and Soviet advances. In 1970, China launched its first satellite and in 2003 was able to put its first astronaut into orbit with its own vehicle (Shenzhou 5). In 2013, China was able to land its first probe on the moon (a feat that had not been accomplished since 1976). In 2019, it explored the dark side of the Moon and managed to germinate seeds for the first time on a celestial body. It is currently developing projects for manned missions to the Moon and Mars, creation of a lunar base, and a new space station orbiting Earth[5]. The Chinese space program unites the objectives of the First and Second Space Age, since one of its motivators is the search for prestige in order to consolidate the country's image as a global power (HANDBERG; LI, 2007; HARVEY, 2019).

The Indian space program is old, having started its first efforts in the 1960s. Unlike other countries, its main objective was not the military issue, but the possibility of promoting socio-economic development and poverty reduction through technological advancement. Another characteristic concerns its willingness to cooperate with other nations. In 1969, the Indian Space Research Organization (ISRO) was created. In 1980,

[5] The Chinese space program in different national organizations that include the China National Space Administration (CNSA), the China Aerospace Science and Technology Corporation (CASC) and the China Aerospace Science and Industry Corporation (CASIC).

India launched its first satellite using a national launch vehicle. Its first lunar probe was launched in 2008 (Chandrayaan-1), having discovered evidence of the existence of frozen water on the celestial body. In 2013, it was its turn to send a probe to Mars. India has specialized in producing microsatellites, developing the technology to launch hundreds of space objects in one launch. ISRO is also studying the possibility of independently putting its first astronaut into orbit. (ALIBERTI, 2008).

In the European context, the European Space Agency (ESA) is noteworthy, an international organization created in 1975. In this context, the main European countries chose to discontinue part of their national space programs to join efforts and resources around a common and integrated policy. Today, the institution brings together 22 countries. ESA's largest funder is France. In its early days the organization established strong links with NASA, but today it develops its projects more independently, cooperating also with Russia and China. The ESA's recent plans include unmanned missions to Mars and Venus and the improvement of its rocket systems.

Japan has also been outstanding in its space activities. In 1970, it launched its first satellite. In 2003, its program went through a restructuring, with the creation of the Japanese space agency (Japan Aerospace Exploration Agency - JAXA). Its main achievements involve sending unmanned missions to asteroids (in 2005, 2010, and 2018) (PEKKANEN; KALLENDER-UMEZU, 2010).

One debate that has gained prominence in recent years is the identification of a possible "militarization" of outer space. Several countries are creating and improving military structures with space capabilities. It is necessary to establish analysis parameters for this process. This is a consequence of the increased economic and strategic importance of satellite resources, which in itself would justify their inclusion and resizing in national security and defense policies. Military participation, however, is not a novelty. Military objectives have always been present in the space programs of the USA and USSR, as commented in the first chapter. Although the public better knows the civilian face of these policies, there was a continuous development of several projects in the military area. For decades, military and dual satellites have been launched and operated. The difference lies in the plurality of actors, different from the bipolar scenario of yesteryear, a situation that can potentiate conflict.

From the point of view of strategic studies, it is necessary to precisely delimit the region in which the current security dynamics are taking place, as they occur in a specific place, the space that comprises the Earth's orbit. The current technological stage makes it difficult to establish prospective conflict scenarios involving other regions, such as interplanetary or interstellar space or celestial bodies. In this context, the current analysis is compelled to restrict itself to the reflections of the space artifacts in Earth orbit in the security context.

Today, military space technologies based on satellite resources play a supportive role, allowing armed forces on the ground, at sea and in the air to operate more efficiently (MOLTZ, 2014). One developed concept is that of "command of space". In space activity it would be possible to identify "celestial lines of communication", routes that allow objects to be sent into space, mainly in terrestrial orbits (physical) and the maintenance of communication channels (non-physical). The purpose of "space command" is to control such lines of communication and deny or limit access by enemies (KLEIN, 2006), interfering with the efficiency of their military capabilities. Destroying or disabling artificial satellites, capturing or interfering with their communications, and dominating launch or control bases seem to be natural actions to undermine the enemy's military capabilities in a conflict situation. As space exploration advances in the future, it is possible that the notion of "space command" will expand to encompass other strategic areas beyond Earth orbit.

The U.S. has recently excelled in creating an autonomous space force. This is not, however, a recent process. The country has had military structures dedicated to the space domain since the 1980s, as seen in the first chapter. In 1999, during George W. Bush's administration, the first studies on the possibility of creating a military branch specialized in space security began, in order to guarantee the consolidation of human resources, doctrine, tactics, and procedures in the area. Although the final report of the study pointed to the possibility of development in the future, the project did not prosper with the change in security priorities after September 11, 2001. USSPACECOM was eventually terminated in 2002 and its functions absorbed by the United States Strategic Command (USSTRATCOM). In 2006, a new study analyzed the military use of space, but its recommendations did not advance.

The scenario changed during Donald Trump's presidency. After an unsuccessful attempt at a bill from the legislative branch[6], the government began to support the idea of readjusting military space structures. In current U.S. security and defense documents (National Security Strategy of 2017 and the National Defense Strategy of 2018) outer space had a position of priority.

As a result, in August 2019, USSPACECOM was reactivated. In December 2019, the former USAF AFSPC became the United States Space Force (USSF), becoming the country's new military force, giving it greater autonomy. Under the civilian leadership of the Department of Defense, the USSF merges into the Department of Air Force, which means that it will continue to share some decision-making and bureaucratic structures with the USAF. The USSF's mission is preparedness, consisting of organizing, training, and equipping military forces to protect U.S. and allied interests in space. USSPACECOM, on the other hand, has the role of space force employment.

The current U.S. Defense Space Strategy (Defense Space Strategy of 2020) outlines important guidelines that deserve comment. Outer space is seen as vital to security, prosperity, and scientific development, and is characterized as an indispensable component to ensure the global superiority and projection of U.S. military power. U.S. space systems are potential targets, with China and Russia as the main threats. The outer space is seen as a possible site of conflict (warfighting domain), and it is necessary to defend American interests, allies, and commercial partners, even with military force.

In June 2020, the USSF published its first doctrine (Space Power: Doctrine for Space Forces). One of the aspects introduced by the document is the definition of "core competencies". These competences include a) space security: establishing and promoting stable conditions for access to space activities by civilian actors, commercial actors, the intelligence community, and international partners, b) "combat power projection": maintaining freedom of action to restrain foreign aggression or compel behavior change, c) "space mobility and logistics" enabling the movement and support of military equipment and personnel, d) "informational mobility": collecting and transporting data across different military operations, e) "space

[6] In 2017, members of the House of Representatives proposed the creation of a U.S. Space Corps, similar to the U.S. Marine Corps. The bill passed the House, but was unsuccessful in the Senate.

situational awareness": identifying, characterizing, and understanding any factor associated with the space domain that may interfere with space operations, affecting safety and security, economy, or environment (USSF, 2020).

It is noteworthy that the U.S. experience with the creation of the USSF is not isolated. Russia, China, India, Japan, and France have publicly demonstrated their intention to follow the US from the development of their military space components, with their own characteristics and varying degrees of autonomy.

Russia pioneered the creation of a military space force, which has held various positions in the command structure. In 1992, the Russian Space Force was created as an independent branch. In 1997, it was incorporated into the Strategic Missile Force, the military branch responsible for nuclear weapons. In 2001, it regained its autonomy, which lasted until 2011, when its merger with the Air and Missile Defense Force occurred (VENET, 2015, p. 360). In 2015, a new structural change promoted the integration with the Air Force, creating the Russian Aerospace Force. Currently, the Russian Space Force is a substructure of this military branch, its main objectives being to monitor space objects and identify threats to Russia, as well as combat them; detect ballistic missile launches; launch special artifacts into orbit and control military or dual satellites. According to official documents (Russia's National Security Strategy to 2020), control of space by foreign nations is seen as a possible threat to Russian security.

After a restructuring process, in 2015 China created the Strategic Support Force. It concentrates the cyber, electronic, psychological, and space warfare capabilities in a single structure. Within the Strategic Support Force is the Space Systems Department, which is responsible for controlling all military operations in the area, which includes the launch and control of space artifacts. It is constituted as a branch of the Chinese military (People's Liberation Army) in order to avoid redundancies and disputes for resources (COSTELLO; MCREYNOLDS, 2018). The 2019 Chinese Defense White Paper (China's National Defense in the New Era) places outer space as a critical domain for international strategic competition. According to the document, space security provides guarantees for national and social development (CHINA, 2019).

India, for its part, created in 2018 the "Defense Space Agency" (DSA), which brings together its three military forces. It also created the Defense Space Research Agency (DSA), with the aim of developing military

technology in the area. In a recent study that may serve as a basis for the development of a national security strategy, Hooda (2019) indicated that India should increase defense capabilities for conflicts involving the space scenario. This is a new experience for the country because of the civilian tradition of the Indian space program (NAGAPPA, 2015).

In 2008, Japan drafted a new national legislation regulating space activity (Basic Space Law), allowing the development of systems aimed at national security (PEKANNEN; KALLENDER-UMEZU, 2010). Japan's official defense strategy document, the 2018 National Defense Program Guidelines, establishes the need to promote military superiority in the space domain (JAPAN, 2018). In May 2020, Japan created the Space Operations Squadron within its Air Self-Defense Force. Its purpose is to promote the protection of Japanese satellites from damage, including armed attacks, as well as to monitor debris and other space artifacts.

In 2019, France published its Space Defense Strategy, stating the need to protect its capabilities and resources in the sector (FRANCE, 2019). In the same year, the country created its own space command. In 2020, the name change of the French Area Force was announced, which was renamed "Air and Space Force" (Armée de L'Air et de L'Espace).

In addition to the "militarization" process, there would be a possible weaponization of outer space. From a theoretical point of view, a conflict developed in Earth orbit, the "orbital warfare", could involve three classes of offensive operations (a) "Space-Earth", which comprises the placement of weapons in orbit to hit targets on Earth, (b) "Space-Space", which refers to the use of weapons in orbit to hit other objects also in orbit, (c) "Earth-Space", which concerns the destruction of object in orbit from the use of weapons on Earth (WAY, 2020; HOSTBECK, 2015).

Due to the strategic importance of satellite resources, the current focus is on the development of "anti-satellite weapons" (ASAT). - ASAT), which comprises "Space-Space" and "Earth-Space" operations. ASAT technology has already been tested by the US, Russia, China and India (MOLTZ, 2014, p. 29; HOSTBECK, 2015).

Four are the classifications of ASATs (WAY, 2020). First, "Kinetic and Physical Weapons", which aim to either cause physical damage or destroy satellites through direct impact. In this context, ballistic missiles launched from Earth, or equipping a satellite with armaments (co-orbital space weapon).

Kinetic weapons can generate space debris, posing serious collateral risks to other satellites in orbit and to the Earth itself, as fragments may hit them. The test conducted by China in 2007 in destroying one of its satellites was heavily criticized by other states (DAWSON, 2017), as it would have generated thousands of space debris, imposing serious risks to the space environment for decades (SADEH, 2015).

Second, "Non-Kinetic and Physical Weapons", capable of causing physical damage without direct contact. Examples are the use of electromagnetic pulse (EMP) weapons, including those generated by nuclear detonation, or high-powered microwave (HPM) weapons, both activated in space. Another possibility is the use of ground-based lasers (GBL), because of the infrastructure required to maintain them (HOSTBECK, 2015).

Third, "Electronic Weapons," which aim to target the means by which space systems transmit and receive data. The electronic attack uses radio signals to cause interference with communication (a technique known as jamming), temporarily disabling it, or frequency imitation (a strategy called spoofing), with the goal of sending false data to users or controlling the satellite.

Fourth, "Cyber Weapons", which are similar to electronic ones, but do not interfere with radio signals, attacking the data system itself instead. Any interface of the space system can be hacked, such as the base and network that control the satellite from the ground. Cyber attacks allow the interception, monitoring, and destruction of data or control of the satellite itself.

Although these military space technologies are available, at least in theory, their future employment may face a number of barriers. The high financial cost and the risks involved, which may make the use of Earth orbit by all states permanently unviable, require consideration. There is a tendency for electronic and cyber means to be favored (HARRISON, 2015, p. 128). An alternative possibly under development is the use of unmanned aircraft capable of suborbital flight and equipped with military capabilities (including non-kinetic and electronic weapons). Finally, it is noted that a conventional attack on the ground infrastructure connected to satellites, such as control bases, information reception and antennas, seems to be a much simpler and cheaper option (MOLTZ, 2014).

An important discussion that deserves reproduction concerns the legal limits of the militarization and weaponization of space. This is a debate occurring since the early years of international regulation of space, but with

the growing warmongering behavior of some states, there is a tendency to gain even more prominence in the coming years. The positions can be divided into two currents (FREELAND, 2015).

Affiliated to the first current, Schmitt (2016) and Stephens (2018) understand that the Space Treaty would not prohibit military operations in general, including Earth orbit. In this step, the only illegal activities would be operations carried out on celestial bodies (such as the Moon or Mars), which cannot involve the creation of military bases, installations and fortifications, testing of any kind of weapons, and military maneuvers. With regard to the use of weaponry, the advocates of this current understand that the Space Treaty would only prohibit the use of nuclear weapons and weapons of mass destruction, not mentioning other types of warlike devices launched into space or placed in Earth orbit (SCHMITT, 2016, p. 16; STEPHENS, 2018, p. 80). The U.S. position is in the sense that the use of space for "peaceful purposes" should be interpreted as being "non-aggressive purpose" (KLEIN, 2006, p. 12), thus allowing for defensive operations.

A second perspective is critical of the militarization and weaponization of space, considering it an affront to the Treaty. Markoff (1976), Vlasic (1981), and Cheng (1983) believe that unilateral military actions would violate the peaceful character of the document, not occurring according to the "common good and interest of all countries" ("common good clause", art. 1 of the Space Treaty). Along these lines, the very existence of military structures with force projection in outer space (such as the U.S. Space Force and the like) could be reviewed. The unilateral defense of militarization would lead to the discrediting of multilateral mechanisms to discuss the issue, with COPUOS as the place of excellence, disregarding the interests of a significant group of countries that currently develop space activity.

It is possible to identify a growing concern around the disastrous consequences of a possible "space arms race" (CHRISTOL, 1985), which may affect the socioeconomic benefits derived from satellite resources (SHEEHAN, 2015). Currently, such concern can be felt in several important international forums, such as the Conference on Disarmament, Council of the European Union, COPUOS Legal Subcommittee, and the UN General Assembly.

FINAL CONSIDERATIONS

The history of international space policy intertwines with the evolution of the security dynamics established in the post-World War II context. The figure of the rocket is emblematic and demonstrates well the duality that permeates the application of space technology (civilian and military). The same structure capable of launching an object of destruction is also responsible for discoveries that allow humanity to put itself in a new perspective vis-à-vis its planet and launch itself towards the last frontier, space.

Strategic objectives have been present since the beginning of the First Space Age. The space race that took place during the Cold War, besides being a historical milestone, also served as an instrument to expand the prestige and military capabilities of the parties in dispute, the U.S. and USSR. In parallel to the civilian research that was more widely known and publicized, several projects related to space security were developed.

Thus, in a comparison between the First and Second Space Ages, it is possible to identify a continuity in the strategic use of outer space, so that issues involving space security will continue to play a relevant role. The changes, in turn, are of two kinds. The first is the growing importance of artificial satellites, both from a military and economic point of view, which feeds back into the need to defend these valuable resources. The second concerns the multiplicity of new space actors, represented by dozens of states and private organizations, which increases the complexity of interactions and may contribute to the establishment of conflicts. It should be noted that the immediate arena of the dispute is still limited to Earth orbit, but it is possible that this situation will expand in the future.

The emergence of new military structures aimed at space security, as well as the development of theories on strategies for a possible "orbital conflict" are, in reality, symptoms of this new period under construction and full of vagueness. The North American experience is not an isolated initiative, since Russia, China, Japan, France, and India, the main space powers, have also demonstrated similar projects.

Finally, the possible expansion of the militarization and weaponization of outer space is a matter of great concern in international forums. The discussion about the legality of this process vis-à-vis the legal regime of the Space Treaty will be an issue that is likely to dominate debates about space security in the coming years.

POLÍTICA ESPACIAL E SEGURANÇA: MUDANÇAS E CONTINUIDADES NA SEGUNDA ERA

RESUMO

O presente artigo possui como problema de pesquisa investigar a política espacial relacionada à área da segurança (*space security*), de modo a identificar os principais fluxos de mudanças e continuidades entre a Primeira (1957-1991) e a Segunda Era Espacial (1991-?). Sob o ponto de vista metodológico, a investigação constitui-se de uma revisão bibliográfica e de uma análise documental. O trabalho divide-se em duas partes: a primeira reconstitui a corrida espacial ocorrida durante a Guerra Fria, enquanto a segunda investiga as dinâmicas contemporâneas da segurança espacial. Como considerações finais, foi possível observar uma continuidade no uso estratégico do espaço exterior. Foram encontradas duas mudanças. A primeira diz respeito à crescente importância dos satélites artificiais, tanto do ponto de vista militar quanto econômico. A segunda refere-se à pluralidade dos novos atores espaciais, o que aumenta a complexidade das interações e pode contribuir para o conflito.

Palavras-chave: Espaço; Segurança; Satélites Artificiais; Militarização.

REFERENCES

ALIBERTI, Marco. **India in Space**: Between Utility and Geopolitics. New York: Springer, 2018.

BRZEZINSKI, Matthew. **Red Moon Rising**: Sputinik and the Hidden Rivalries that Ignited the Space Age. New York: Time Books, 2007.

CADBURY, Deborah. **Space Race**: The Epic Battle Between America and the Soviet Union for Dominion of Space. New York: Harper Perennial, 2007.

CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES (CSIS). **History of the NASA Budget**. Available at: aerospace.csis.org/data/history- nasa-budget/. Accessed on: Sep. 5, 2020.

CHENG, Bin. The Legal Status of Outer Space and Relevant Issues: Delimitation of Outer Space and Definition of Peaceful Use. **Journal of Space Law**, v. 11, n. 2, p. 89-105, 1983.

CHINA. **China´s National Defense in the New Era**. 2020. Available at: http://eng.mod.gov.cn/news/2019-07/24/content_4846443.htm. Accessed on: Sep. 20, 2020.

CHRISTOL, Carl Q. The Common Interest in the Exploration, Use and Exploitation of Outer Space for Peaceful Purposes: The Soviet-American Dilemma. **Akron Law Review**, v. 18, n. 2, p. 193-222, 1985.

CORBETT, Julian S. **Principles of Maritime Strategy**. New York: Dover, 2004.

COSTELLO, John; MCREYNOLDS, Joe. **China's Strategic Support Force**: A Force for a New Era. Washington, D.C.: National Defense University Press, 2018.

DAWSON, Linda. **The Politics and Perils of Space Exploration**: Who Will Compete, Who Will Dominate? Suiça: Springer, 2017.

DOLMAN, Everett C. **Astropolitik**: Classical Geopolitics in the Space Age. New York: Routledge, 2001.

DOLMAN, Everett C. U.S. Space Security Priorities: War, Policy and Spacepower. In: SCHROGL, Kai-Uwe et al. (org.) **Handbook of Space Security**. New York: Springer, 2015, p. 309-324.

FIGUEIREDO, Eurico de Lima. Estudos Estratégicos como Área de Conhecimento Científico. **Revista Brasileira de Estudos de Defesa (RBED)**, v. 2, n. 2, p.107-128, jul./dez. 2015.

FRANCE. Ministry for the Armed Forces. **Space Defense Strategy**. Available at: https://www.defense.gouv.fr/content/download/574375/9839912/Space%20Defence%20Strategy%202019_France.pdf. Accessed on: Sep. 20, 2020.

FREELAND, Steven. The Laws of War in Outer Space. In: SCHROGL, Kai Uwe et al. (org.) **Handbook of Space Security**. New York: Springer, 2015. p. 81-110.

FUKUYAMA, Francis. **The End of History and The Last Man**. New York: Free Press, 1992.

HOSTBECK, Lars. Space Weapons´ Concepts and their International Security Implications. In: SCHROGL, Kai-Uwe et al. (org.) **Handbook of Space Security**. New York: Springer, 2015. p. 955-983.

HUNTINGTON, Samuel P. The Lonely Superpower. **Foreign Affairs**, n. 78, v. 35, p. 35-49, 1999.

JOHNSON-FREESE, Joan. **Space Warfare in the 21s Century**. New York: Routledge, 2017.

KENEZ, Peter. **A History of Soviet Union from the Beginning to the End**. 2. ed. Cambridge: Cambridge University Press, 2006.

KLEIN, John J. **Space Warfare**: Strategy, Principles and Policy. New York: Routledge, 2006.

HANDBERG, Roger; LI, Zhen. **Chinese Space Policy**: A Study in Domestic and International Politics. New York: Routledge, 2007.

HARRISON, Roger. The Role of Space in Deterrence. *In*: SCHROGL, Kai Uwe et al. (org.) **Handbook of Space Security**. New York: Springer, 2015. p. 113-130.

HARRISON, Todd. **International Perspectives on Space Weapons**. Washington, D.C.: Center for Strategic and International Studies, 2020.

HARVEY, Brian. **China in Space**: The Great Leap Foward. 2. ed. New York: Springer, 2019.

HAYS, Peter L. **Space and Security**: A Reference Handbook. Santa Barbara: ABC-CLIO, 2011.

HAYS, Peter L. Spacepower Theory. In: SCHROGL, Kai-Uwe et al. (org.). **Handbook of Space Security**. New York: Springer, 2015. p. 57-79.

HAYS, Peter L.; LUTES, C. D. Towards a theory of spacepower. **Space Policy**, v. 23, n. 4, p. 206–209, nov. 2007.

HOODA, D. S. **India´s National Security Strategy**. Available at: https://manifesto.inc.in/pdf/national_security_strategy_gen_hooda.pdf. Accessed on: Aug. 29, 2020.

HUNTINGTON, Samuel P. The Lonely Superpower. **Foreign Affairs**, New York, v. 78, n. 2, p. 35-49, 1999.

JAPAN. **National Defense Program Guidelines**. 2018. Available at: https://www.mod.go.jp/j/approach/agenda/guideline/2019/ pdf/20181218_e. pdf. Accessed on: Aug. 29, 2020.

MARKOFF, Marko G. Disarmament and "Peaceful Purposes" Provisions in the 1967 Outer Space Treaty. **Journal of Space Law**, v. 4, n. 1, p. 03-22, 1976.

MOLTZ, James Clay. **Crowded Orbits**: Conflict and Cooperation in Space. New York: Columbia University Press, 2014.

NAGAPPA, Rajaram. Space Security in India. *In*: SCHROGL, Kai-Uwe et al. **Handbook of Space Security**. New York: Springer, 2015. p. 453-467.

PEEBLES, Curtis. **High Frontier**: The United States Air Force and the Military Space Program. Washington, D.C.: U.S. Government Printing Office, 1997.

PEKANNEN, Saadia M.; KALLENDER-UMEZU, Paul. **In Defense of Japan**: From the Market to the Military in Space Policy. Stanford: Stanford University Press, 2010.

RUSSIAN FEDERATION. **Russia's National Security Strategy to 2020**. Available at: https://www.files.ethz.ch/isn/154915/Russia's%20National%20Security%20Strategy%20to%202020%20-%20Rustrans.pdf. Accessed on: Sep. 20, 2020.

SADEH, Eligar. Obstacles to International Space Governance. *In*: SCHROGL, Kai-Uwe et al. (org.) **Handbook of Space Security. New York**: Springer, 2015, p. 23-39.

SATELLITE INDUSTRY ASSOCIATION (SIA). **2020 State of the Satellite Industry Report**. Available at: https://sia.org/news-resources/state-of the-satellite-industry-report. Accessed on: Sep. 20, 2020.

SCHMITT, Michael N. International Law and military operations in Space. **Max Planck Yearbook of United Nations Law**, v. 10, p. 89-125, 2006.

SHEEHAN, Michael. Defining Space Security. *In*: SCHROGL, Kai-Uwe et al. (org.) **Handbook of Space Security**. New York: Springer, 2015, p. 07-22. SHEEHAN, Michael. The International Politics of Space. Nova Iorque: Routledge, 2007.

SMITHSONIAN NATIONAL AIR AND SPACE MUSEUM. **V-2 Missile**. Available at: https://airandspace.si.edu/collection-objects/v-2-missile/nasm_A19600342000. Accessed on: Sep. 20, 2020.

STEPHENS, Dale. The international legal implications of military space operations: examining the interplay between International Humanitarian Law and the outer space legal regime. **International Law Studies**, v. 94, p. 75-101, 2018.

UNION OF CONCERNED SCIENTISTS. **UCS Satellite Database**. Available at: https://www.ucsusa.org/resources/satellite-database. Accessed on: Sep. 20, 2020.

UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS (UNOOSA). **Status of International Agreements relating to Activities in Outer Space**. Available at: https://www.unoosa.org/documents/pdf/spacelaw/treatystatus/TreatiesStatus-2020E.pdf. Accessed on: Sep. 28, 2020.

UNITED STATES OF AMERICA. **Defense Space Strategy**. 2020. Available at: https://media.defense.gov/2020/Jun/17/2002317391/-1/-1/1/2020_DEFENSE_SPACE_STRATEGY_SUMMARY.PDF. Accessed on: Sep. 29, 2020.

UNITED STATES OF AMERICA. **National Defense Strategy of the United States of America**. 2018. Available at: https://www.defense. gov/Explore/Features/Story/Article/1656414/what-is-the-national-defense strategy/. Accessed on: Sep. 20, 2020.

UNITED STATES OF AMERICA. **National Security Strategy of the United States of America**. 2017. Available at: https://www.whitehouse. gov/ wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf. Accessed on: Sep. 20, 2020.

UNITED STATES SPACE FORCE (USSF). **Space Capstone Publication Spacepower**: Doctrine for Space Forces. Washington, D.C.: United States Space Force, 2020.

VENET, Christophe. Space Security in Russia. SCHROGL, Kai-Uwe et al. (org.) **Handbook of Space Security**. New York: Springer, 2015. p. 355-370.
VLASIC, Ivan A. Disarmament Decade, Outer Space and International Law. McGill Law Journal, v. 26, n. 2, p. 135-206, 1981.

WAY, Tyler. Counterspace Weapons 101. **Aero Space Security (CSIS)**, 2 jul. 2020. Available at: https://aerospace. csis.org/aerospace101/ counterspace-weapons-101. Accessed on: Jul. 18, 2020.

WILLIAMS, Paul D. **Security Studies**: An Introduction. 2. ed. New York: Routledge, 2012.

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