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The geostrategic position of the Azores Archipelago and the current space race

Opportunities for Portugal

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INTRODUCTION

The Portuguese National Space Strategy was defined by the Council of Ministers Resolution no 30/2018 (March 12th), named as Portugal Space Strategy 2030 (PSS 2030). In this document it is recognized that societal safety and well-being are increasingly dependent on information and services from space in such diverse activities as agriculture, fisheries, monitoring of infrastructures and of maritime zones under national sovereignty or jurisdiction, urban development, defense and security, and even public health (Estratégia Portugal Espaço 2030, 2018).

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The international context regarding the space sector is marked by increasing competitiveness and new opportunities. It is significantly important to reflect on the importance of a new strategy to take advantage of the Portuguese Atlantic position and of the valuable opportunities that the Azores presents in that regard (Estratégia Nacional do Espaço, 2018).

Thus, this reflection is based on the argument that the current overview and the strategic environment concerning space exploration, with its services and various possibilities provided by space technology, could be an opportunity for Portugal. This is not only due to the geostrategic position of the Azores Archipelago, the country's rapid growth in technology development, resulting from the current Information Age or the 4th Industrial Revolution, but it is also a means to meet the State's needs and responsibilities within the international system.

To further develop this idea, the different space races are briefly presented from the beginning of space exploration to the present day. Afterwards, the PSS 2030 is analyzed with the purpose to identify Portugal's potential value on using this strategy.

SPACE RACES

Space exploration is a reality that dates to the end of World War II with the German V-2 rockets. This period's technological evolution allowed the Union of Soviet Socialist Republics (USSR) to launch, in October 1957, the first artificial satellite: The Sputnik-1.

The USSR, in addition of being the first to launch a satellite into space, was responsible for many pioneering achievements in this domain. These pioneering achievements fit into what would be the first space race, in the midst of the period recognized within International Relations as the "Cold War", during which the USSR and the United States of America (USA) dominated space access, which was part of the ideological and technological confrontation between them. In this first

space race, mankind landed on the moon in July 1969 within the scope of the USA's space program, there were developments on space-based technologies which have transformed many aspects of life on Earth –satellite television, mobile phones and the Internet. Therefore, space has been, since the beginning of its exploration, a determining factor for policies and for life itself in our contemporary world (Cepik, 2015, p. 23).

In this first race (until 1991), although with lesser expression, there were other actors who were able to autonomously access space with launching capacity and satellites: France (1965), Japan (1970), China (1970), United Kingdom (1971), European Space Agency – ESA (1979), India (1980) and Israel (1988). With the end of the USSR, the USA assumed a prevailing position in this field, which led to the second space race.

This second space race is marked by the operational integration of space technology in the field of security and defense, which transformed the art of war, granting strategic advantage and dissymmetric value to those who acted with this technology. This was mostly achieved by the access and diffusion of information, and by its efficiency and effectiveness in the use of precision weapons.

The first Gulf War, in 1991, was considered a pioneering event in space exploration, as the first theater of operations in which combat forces were deployed, maintained, commanded and controlled, engaging in new ways provided by space technology, in particular by satellite communications (SATCOM), as well as precision munitions employment. In just 10 years, with the intervention carried out in Afghanistan – led in 2001 by the USA with some allies, and mainly with the involvement of the North Atlantic Treaty Organization (NATO), in 2003– a dependence on space technology was identified, as well as a technological gap provided by it, within international cooperation.

Technological development and the recognition of space as a potential leverage – both for affirmation in the international system and for economic growth, but also

because it enhances a unique set of practices with dual character – were reflected in the will of other state and non-state actors to enable themselves to access and explore space technology. Such political views are comparable to the will to control other domains, signs of power from the past, such as the sea (Mahan's naval power), which placed states in a privileged position compared to the others (Space Working Group, 2003).

However, it is in the third and current space race that non-state actors are asserting themselves. This race started in 2009, when a non-state player, the private firm Space X, developed an autonomous launching capability to set a Malaysian observation satellite into orbit. This autonomous capacity has allowed to democratize access to space and has, therefore, provided greater availability of services (Johnson-Freese, J., 2017, p. 28).

A sign of these actors' total integration in this domain is the appearance of more companies with similar capabilities (such as Rocket-Lab from the USA, and i-Space from China) and even the launch of astronauts in June 2020, by Space X, which made it possible to build a bridge for US dependency on this capability . As in the international system, the tendency in the spatial domain is to increase the complexity of relations between the actors, who are increasingly more, and whose dependencies and interactions translate into progressive qualitative and quantitative multiplication of the centers of decision, dialogue, and cooperation.

Non-state actors now assume an important role in terms of enjoying the scope provided by space technology. According to the database of the Union of Concerned Scientists (UCS), as of April 2020, 1455 out of 2666 operational satellites located in different orbits with more than 600 kg will be used for commercial purposes, which is becoming the most representative purpose for this type of satellites.

For small satellites (under 600 kg), which correspond to space technology that operates at a lower height – between 100-350 km of altitude – the number of

equipment for commercial purposes is extremely relevant. In the last decade, the number of small satellites has had an upward and important growth, mainly justified by its cost, which allows a democratization in the access to space, by both state and non-state actors.

These satellites, launched into low orbits in greater number to cover the same areas as current satellites with higher orbits, may, however, constitute an alternative to the usual type of satellites (RT.com, 2014). Although they represent the latest technological evolution, exponentiated by nanotechnology, they are lighter, easier to acquire and to launch. Nonetheless, they will have a shorter life span due to their low orbit and, thus, will be more susceptible to terrestrial gravity (RT.com, 2014).

However, not only the increasing number of satellites limits the orbits available for operation in space, but it also increases the likelihood of collisions amongst them. In this field, space junk that is mainly made up of old satellites, of elements dropped during the launch path or other particles released by Man into space – namely anti-satellite tests (ASAT) – becomes relevant to address. Space junk corresponds to elements in orbit without any terrestrial control that, when they are on a collision course with operational elements, force the latter to move, which may jeopardize their integrity or reduce their life span by consuming energy to alter their orbit (NOAA, 2013).

Indubitably, space portrays itself as an increasingly congested, contested, competitive territory. Additionally, the current dependence in the civil and military domains justifies the search for freedom of action and exploitation of services or products provided by space technology. This perspective, which supports the existing property and the competition for a position in space, may lead to the use of weaponry or equipment in this environment. In other words, the active militarization or contestation for the use of space may mark the current space race and launch a new one. Examples of such developments can be identified: the creation of the sixth Branch of the American Armed Forces – the

United States Space Force –, and the establishment of national strategies – such as the US new Defense Space Strategy (June 2020) or the French Space Defense Strategy (July 2019), are events that seek to safeguard access and freedom of action in space, with the possibility of fueling an arms race at the same time.

Recent steps towards the search for freedom of action in space embody the concept of Space Power, which is not only translated by having satellites and access to space, but also by everything that a country, or a group of countries, can obtain through it (Peter, 2009, p. 2).

Space, which initially was represented as a territory reserved for states and as a global common, currently presents itself as an available market for a set of non-state actors (companies with commercial purposes), which enhances the current concept of "New Space" .

“NEW SPACE” AND PORTUGAL

In Portugal’s case, the highlight of our relationship with the space domain occurred on September 26th, 1993, with the launch of the PoSAT-1 satellite, the first and only one to this date. The satellite, built as part of a technology transfer program, was launched on board of the Ariane 4 spacecraft from the Kourou Space Center and placed Portugal amongst a restricted group of states with its own satellites. This gave Portugal some – though very limited – autonomy in SATCOM and monitoring (photographic images).

PoSAT-1 stopped functioning with operational value in 2005. However, it was covered by a program of great international prestige, which was initially more ambitious because it would include a network of 20 satellites (Porfirio, 2016). This ambitious project would become the netSAT network. Financing difficulties associated with the European cooperative vision for space capabilities led to a paradigm change in terms of the space power capabilities compared to what Portugal intended to have (Marado, 2013a, p. 21). PoSAT-1 was an experimental

and non-commercial system that assumed the perspective of a scientific and technological national project, and it allowed the Portuguese industry to build up knowledge to face international space programs and markets (Rodrigues, 1996). Portugal does not currently have any operational satellite that can support a spatial capacity to attend its needs, with its space policy being dependent on the intervention of third parties.

The “New Space” concept could change this paradigm and reverse Portugal’s significance and importance, in order to economically catapult and generate qualified employment in the space domain. This is one of the PSS 2030 strategic goals. Other aims are: to boost the development of the space sector, to transform Portugal into a stronger actor in this field through national initiatives and international cooperation, and to contribute to the development of the country and to the strengthening of diplomatic relations and international scientific cooperation.

PSS 2030 aims to take advantage of Portugal’s geostrategic position, particularly the Azores Archipelago, for the space sector, providing for the construction of a space port on Santa Maria Island for space launches into low orbits.

On the one hand, this strategy also allowed for the creation of Portugal Space, the Portuguese Space Agency, which is set up as the national entity in charge of spectrum management, technology transfer, and regulatory frameworks for responsible use of space. Besides this, it made room for collaboration with other actors to obtain a greater return on national investment in space. On the other hand, this strategy predicts in an inclusive way the close collaborative relationship with ESA, with the European Commission, and with other relevant international actors.

The industrial dimension of space, from the European perspective, is recognized as a decisive factor for increasing the competitiveness of the European industry, and the European political authorities acknowledge its economic potential. A sign

of this is the strengthening of common relations between ESA and the European Union (EU) itself (Hörber, 2016). As it is stated in the press release of the EU Commission from March 2019, “In June 6th, 2018, the European Commission presented its proposal for a regulation to create the European Union space program. This regulation will make it possible to develop the EU's space strategy (ESS)” (CsUE, 2019a.). At the same time, the EU reached a preliminary common understanding to define its own space policy for the period of 2021-2027 (CsUE, 2019a.). It is within this framework that Portugal and France will assume the Presidency of ESA, for the period of 2020 to 2023.

The choice of Portugal to preside with France the ESA Ministerial Council could be an opportunity to fulfill the strategic aims of PSS 2030, particularly regarding the launch capacity and, eventually, the establishment of a satellite network for various purposes. Azores Archipelago's geostrategic position, with freedom for space launches, combined with Portugal and France's leadership, could be a competitive advantage for Europe compared to the strategic positions of countries such as the USA, China or Russia – the current dominant players.

In the national scope, the most recent developments and the chosen strategy place Portugal in a level of prominence in the international overview because setting a space port, with capacity to launch to low orbits, allows the country to join a restricted group of actors with the same ability . In addition to the value in the economic and business sectors, this ability would also be a facilitating tool for building satellite capacity to respond to national needs and responsibilities, within the scope of exercising sovereignty, which can only be overcome by space technology taking into account the attributes associated with it, in particular persistence, perspective and penetration . Considering this, satellite capacity could be used for observation or monitoring of the extension of the Continental shelf – since it clearly is an extensive area, which can only be constantly monitored through space.

Nevertheless, it will be from a cooperative perspective that Portugal will be able to aim for value through its PSS 2030, which is even stated as a strategic goal.

Through the ESA, of which Portugal has been a part since 2000, joining the process of consolidating European values, it may be assumed what the tendency of small powers will be to move towards obtaining capacities provided by space technology, not isolated, but in a cooperative way.

In this cooperation, the value for Portugal cannot be derived exclusively from France, a relevant international space power. In addition to the Presidency of the Ministerial Council of ESA in the 2020-2023 period, Portugal and France will also assume the Presidency of the Council of the European Union, which could be a facilitator for the definition of a European Space Policy.

Still within the value provided by cooperation, it could be relevant to make a reference to the Atlantic International Research Center (AIR Center), which is dedicated to integrated research in the areas of space, oceans, climate, energy and data science. This organization has links established beyond ESA's lines, reaching actors such as the USA, Nigeria, Brazil, Uruguay, Angola, Cape Verde, S. Tomé and Príncipe, and South Africa, with the Atlantic Ocean in common. Space technology, when taken advantage of its attributes, may represent the key element in the collection of information from the Atlantic Ocean and in the fulfillment of the aims of this organization.

CONCLUSIONS

From what was previously discussed, in the core of space exploration, one can already distinguish three races. The first was dominated by the USSR and the USA during the "Cold War". Subsequently, the second race, in the post-Cold War and at the unipolar moment of the international system, was marked by the hegemony of the USA, which prepared the entry of other actors for space exploration, particularly non-state ones. Currently, we are witnessing a new space race, with non-state actors stepping forward under the concept of "New Space".

Within this concept part of the current space race, in the democratization of access to space and based on the PSS 2030's opportunities, Portugal can be identified as a state with a specific geostrategic position of relevance, found in the Azores Archipelago.

Especially through cooperation, this geostrategic position and the operationalization of PSS 2030 could be an opportunity for Portugal, not only from an economic point of view – with the creation of a technological vanguard image – but also from exercising of sovereignty.

PSS 2030 and the permanent monitoring of strategic spaces of permanent national interest in Portugal may be some of the opportunities within the scope of the exercise of sovereignty. However, others can be identified in the construction of a national total strategy, such as the values provided by the economic and social sectors, and the projection of an international innovation image.

Therefore, this reflection allows us to sustain that, considering the current developments around space exploration – particularly those integrated in the concept of “New Space” – the relevance of the geostrategic position of the Azores Archipelago may be the motto, within the Portuguese functional power, for the elevation of its overall national strategic potential.

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