

# WHEN THE EARTH IS NOT ENOUGH: CHINA'S RACE FOR THE SPACE

QUANDO A TERRA NÃO BASTA: A CHINA NA CORRIDA AO ESPAÇO

CUANDO LA TIERRA NO BASTA: CHINA EN LA CARRERA HACIA EL ESPACIO

PAULO DUARTE<sup>1</sup>

## ABSTRACT

This article aims to emphasise the importance of the race for Space to China. The main argument is that the intense competition for the access to reserves of fresh water, energy resources and rare minerals on planet Earth, along with the ambition of affirmation on the international scene, and an effort to preserve the continuity of the Chinese Communist Party in power, motivate China to embark on a space adventure. In fact, we will try to demonstrate that in a not too distant future, and due to the constant improvement in technology, it will not be inappropriate to speculate that Space can offer several resources that will become increasingly scarce on planet Earth. And, while the most populous country in the world, it makes sense that China dares to explore boundaries until then regarded as unlikely – the asteroids or the Moon – in search of the resources that its population and economy will need, when the Earth will no longer suffice. Besides the political and economic motivations, we will conclude that Space is still important to China in a war context, to the extent that it houses military and civilian satellites, which can easily be neutralised by depriving a rival State to have access to its own sources of information, crucial in a context of military hostility. The qualitative method (hermeneutics) is the methodology that will guide this investigation.

Keywords: China. Race for the Space. Energy and mineral resources. Militarisation of Space.

## RESUMO

Este artigo visa destacar a importância da corrida ao Espaço para a China. O principal argumento reside no facto de a intensa competição pelo acesso a reservas de água fresca, recursos energéticos e minérios raros no Planeta Terra, juntamente com a ambição de afirmação na cena internacional e um esforço de preservar a continuidade do Partido Comunista chinês no poder, motivarem a China a lançar-se na aventura espacial. De facto, procuraremos demonstrar que num futuro não muito distante, e fruto do constante aperfeiçoamento tecnológico, não será descabido especular que o Espaço pode oferecer vários dos recursos que tenderão a escassear no Planeta Terra. E, enquanto país mais populoso do mundo, faz sentido que a China ouse desbravar fronteiras até então tidas como improváveis – os asteróides ou a lua – em busca dos recursos que a sua população e economia necessitarão, quando a Terra já não bastar. Além das motivações económico-políticas, concluiremos que o Espaço é ainda importante para a China num contexto bélico, na medida em que alberga satélites civis e militares, que podem facilmente ser neutralizados, privando um Estado rival de aceder às suas próprias fontes de informações, cruciais num contexto de hostilidade militar. O método qualitativo (análise hermenêutica) é a metodologia que guiará a presente investigação.

Palavras-chave: China. Corrida ao Espaço. Recursos energéticos e minerais. Militarização do Espaço.

## RESUMEN

Este artículo busca destacar la importancia de la carrera hacia el Espacio de la China. El principal argumento reside en que la intensa competencia por el acceso a las reservas de agua pura, recursos energéticos y minerales raros en el Planeta Tierra, conjuntamente con la ambición de reafirmación en el escenario internacional y un esfuerzo por preservar la continuidad del Partido Comunista chino en el poder, motivan a China a embarcarse en la aventura espacial. De hecho, procuraremos demostrar que, en un futuro no muy distante, y fruto del constante perfeccionamiento tecnológico, no será inapropiado especular que el espacio puede ofrecer varios de los recursos que escasearán en el Planeta Tierra. Y, mientras el país más poblado del mundo, tiene sentido que China se arriesgue a explorar fronteras hasta las que se consideren improbables – los asteroides o la luna – en busca de los recursos que a su población y economía necesiten, cuando la Tierra ya no le sea suficiente. A más de las motivaciones políticas y económicas, se concluye que el Espacio es muy importante para a China en el contexto bélico, en la medida en que alberga satélites civiles y militares, que pueden fácilmente ser neutralizados, privando a un Estado rival de acceder a sus propias fuentes de informaciones, cruciales en un contexto de hostilidad militar. El método cualitativo (análisis hermenéutico) es la metodología que guiará la presente investigación.

Palabras clave: China. Carrera hacia el Espacio. Recursos energéticos y minerales. Militarización del Espacio.

<sup>1</sup> Université Catholique de Louvain (UCL) - Louvain-la-Neuve, Bélgica.

Universidade de Lisboa (ULisboa) - Lisboa, Portugal.

E-mail: <duartebrardo@gmail.com>

Doutorando em Relações Internacionais (UCL)

Pesquisador do Instituto do Oriente (ULisboa).

## I INTRODUCTION

This article aims to highlight the importance of China's race for the Space. That said, what is the possible added value of this article, that is, its potential contribution to the development of science? Much has been discussed about the dispute between China and its neighbours in South and Eastern China seas, or more recently, some are starting to write about the Chinese Great Project for the 21st century, called *New Silk Road*. However, the disputes are not always visible and immediate, which gives them a certain mystique and suspense. Space is one of those relatively insurmountable and unknown borders, although the rapid advances of technology (along with Man's unwavering curiosity), have been gradually reversing the equation. Now, in this respect, literature presents some failures, because the topic is too recent with regard to the exploration of mineral and energy resources contained in various kinds of asteroids or the Moon. Therefore, one of the goals of this article is to contribute to and familiarise the reader with a promising subject, to the extent that the future – in the long term of Humanity – depends on the ability of scientific and technological knowledge to challenge and overcome the unknown and distances, in expectation of improving the life conditions on a planet which begins to be too small for a continuous population growth.

That said, the main argument is that the intense competition for the access to reserves of fresh water, energy resources and rare minerals on planet Earth, along with the ambition of affirmation on the international scene, and an effort to preserve the continuity of the Chinese Communist Party in power, motivate China to embark on a space adventure. In fact, we will try to demonstrate that in a not too distant future, and due to the constant improvement in technology, it will not be inappropriate to speculate that Space can offer several resources that will become increasingly scarce on planet Earth. And, while the most populous country in the world, it makes sense that China dares to explore boundaries until then regarded as unlikely – the asteroids or the Moon – in search of the resources that its population and economy will need, when the Earth will no longer suffice. Besides the political and economic motivations, we will conclude that Space is still important to China in a war context, to the extent that it houses military and civilian satellites, which can easily be neutralised by depriving a rival State to have access to its own sources of information, crucial in a context of military hostility.

China is a latecomer in the race for space. As it is well known, the precursors in the matter of space had been the Soviet Union and the United States. In the context of the developments in recent years, we have witnessed the emergence of new space actors, among which the European Space Agency, India, Japan,

Brazil, China or Iran. In the medium and short term, the tendency will be of a space *humanisation*, not only because the technological developments will allow it, but also because the scientific knowledge and the proliferation of actors – where the ambitions and budgets of private actors compete simultaneously with interests and State budgets, often limited<sup>2</sup> by force of circumstances or of other priorities – will facilitate and accelerate the process.

In this mere compass, concomitant to the technical overcoming of distances – where spending holidays in space will no longer be unusual – what are China's ambitions? In a country that thirsts for the future and for prestige, but at the same time nostalgia for a glorious past, imbued with ardent nationalism and pride, it is difficult to conceive that such a large state, in terms of its territory and demography, does not play a more important role in the race for space. As several authors suggest, the future of Humanity is in space. Therefore, it involves an adventure, a business and a necessity. Speaking of necessity, the Earth is becoming too small and the space, in particular through the exploration and drilling of asteroids, will be able to provide various resources and water, so vital they are for a planet which is becoming too small regarding the immeasurable search for minerals, some of them rare.

In this sense, beyond necessity, space is also an opportunity where science meets business, and where the competition between the various private and State actors reduces the costs of space incursions. However, it would be misunderstanding and reckless to predict a radical erasure of the State actor to the detriment of the private actor, since to all purposes it is not in the interest of no great space power that the crucial know-how in terms of military strategy or intelligentsia stays in the hands of any private. Militarisation or nuclearisation of space, for example, or the construction of spy satellites by private actors is a sensitive topic that no prominent State can ignore. Who says the fear in the face of private, also says the fear and distrust between States.

Scientific and technological cooperation will certainly be possible and desirable, but to a certain extent, because as the old maxim of Lord Palmerston teaches us, "states have no permanent allies or friends, just permanent interests" (LEIGH, 2012, p. 68). Thus, China has all the conditions to assert itself in this new century as a Space power, cooperating with the other actors, but, of course, pursuing its own path and ambitions. China has already launched three lunar missions, two lunar orbiters and a lunar rover, and its ambition is to have a manned space station operational by 2020, as well as being in the race for Mars. In this sense, this article aims to contribute to show the hidden side or less obvious Chinese space ambitions.

We will start by making a brief contextualisation

<sup>2</sup> For example, "in the case of the U.S., space related government expenditure has reportedly declined from a high of 4.5% during the Apollo era to below 0.5% today" (BRENNAN, 2015, para. 7).

of China as a space actor, addressing, among other aspects, the contours of its space ambitions, and the exploitation of Space while the factor of legitimacy and preservation of the credibility and maintaining of the Communist Party in power. In a dynamics in which China is just one player in the middle of many others, we will try to understand the economic potential (we include here the minerals and energy resources contained in the Moon and in several types of asteroids) underlying space incursions. We will after address the military importance of space, and we will draw up, at last, possible scenarios in what concerns China's behaviour in a game where, after all, it is not alone. When the Earth is not Enough, as suggested by the title of this article, is therefore the key issue that will guide our analysis. Convinced that the behaviour of the states, the power or influence are not likely to translate into tangible realities or mathematical formulas, we assume that the use of the qualitative method, through the hermeneutic analysis, is the methodology supporting the present investigation, in order to try to understand what drives China to act in this or that way.

## 2 CHINA AS A SPACE ACTOR

China is a relatively new actor in terms of space exploration. In fact, it was only in 1970 that the Chinese released their first satellite and it was only in 2003 that they sent their first astronaut to space. This is a reality that has been changing, i.e., despite being a latecomer, China seems to have embraced the space challenge. Unlike what happened in the past, where the Chinese mainly used the technology that they bought from Russia, China has recently been showing an extraordinary capacity for innovation and adaptation, having at its service highly competent and ambitious young engineers. Proof of this desire to mitigate the technological and scientific backwardness – that pulls it away from, for example, the American or the Russian space enterprises – and to join in full space discovery, 2013 was a historic year for China, which has become the third country, after the United States and the former Soviet Union, to soft-land on the moon. On December 2, 2013, Aljazeera reported that “China launched its first ever extraterrestrial landing craft into orbit en route for the moon in the small hours of Monday, in a major milestone for its space programme” (CHINA..., 2013, para. 2). China landed its Jade Rabbit rover on the moon, which was “the first time anything human-built had touched the moon's surface in nearly 40 years” (DICKERSON, 2015, para. 9).

Having Xi Jinping already declared his ambition to make China a space superpower, “China's military-backed space program is a source of massive national pride, especially its series of successful manned missions that have placed up to three astronauts at a time in an experimental orbiting space station” (ASSOCIATED PRESS, 2014, para. 9). Among China's space plans, the Moon and Mars are two goals of undeniable importance. But while the

challenge of Mars requires greater preparation, China foresees with greater safety the implementation of its next lunar mission, named Chang'e-5, for 2017 or 2018. Chang'e-5, which will be an unmanned mission, aims to take a sample of lunar rock and soil, bringing them to the planet Earth for further scientific analysis.

However, Chinese space ambitions are not restricted to the Moon or Mars, as evidenced by, for example, the Magnetosphere-Ionosphere-Thermosphere Coupling Exploration Mission or, yet, a Solar Probe Orbit Telescope. With its launch date scheduled for 2019, “[the first mission] would place several spacecraft in Earth orbit to study the interaction of the upper atmosphere with magnetic storms”, while “[the second] would place a 1.2-ton spacecraft into an inclined, elliptical orbit around the sun [...] although it is unlikely to fly until after 2020” (FOUST, 2015, para. 14-15). However, the last word will be from the Chinese Government, which may or may not decide to include these two missions in the next Five-year Plan.

James Lewis (2014) believes that the primary motivation of the Chinese space program is political, insofar as it aims to strengthen the legitimacy of the Chinese Communist Party. In fact, according to Lewis, the successes achieved in Space are instrumentalised by the Party to show to the Chinese the progress that their leaders have achieved in order to restore China's global position. Therefore, Lewis (2014, p. 7) argues that “President Xi's attention to and support of the Chinese manned program is unlikely to diminish because it forms a useful counternarrative for the image of the party, which has been injured by widespread corruption and public failures in environment, urban planning, and transportation”.

Having lost, in large part, its mobilizing function, the Party merely assumes, today, a role, essentially, of regulation and distribution, and, on the other hand, its nature became more State-centered than just partisan (DUARTE, 2014). Another factor detrimental to the Party's credibility is concerned with the sociological change, which emerged in its interior. In fact, if once the party presented itself as the vanguard of the peasants and the proletariat, currently it has become a heterogeneous and strangely ambiguous set to, from now on, be able to incorporate, also, the ruling classes, often seen as parasitological and outrageously corrupted groups. In order to circumvent the difficulties that undermine the future of the Party, some strategies were implemented. These are aimed at, mainly, overcoming the reasons of internal discontent, through an ‘ideological’ job, by catechizing the spirit. In other words, we must “concentrate the divergence factors”, not around the Party, but “in ‘noble’ ideals, such as the space race, Taiwan and the Olympic Games” (DUARTE, 2014, p.132)

At the same time, the race to space serves to demonstrate to neighbouring States and particularly to Taiwan, “the seriousness of China's claim to regional

leadership”, and that China “is the most advanced among Asian nations, with technology and resources that others cannot match” (LEWIS, 2014, p.7). In addition to these reasons, Richard Fisher (2015, p.2) reports that the Space is important for the Party “to eventually displace the United States from its position of global leadership”. On the other hand, it is interesting and challenging the relationship that Fisher establishes between China’s assertiveness in South China Sea and its possible behaviour in Space: “As it has gained military power in the South China Sea, China has sought to change the strategic environment and dictate new rules to increase its security at the expense of others. Once it gains commanding strength and position in space, will China do the same?”.

### 3 MINING THE ASTEROIDS AND THE MOON ?

Besides the political interest in exploiting space, there are also other reasons, namely the extraordinary potential of energy and mineral resources that might be promising for countries such as China, which faces serious challenges to its energy security. However, space contains, as well, huge reserves of minerals which are scarce on Earth. Thus, it is not surprising that China is not alone in its interest in exploiting the unknown, given that several authors believe space represents the long-term future of mankind. In a context of undeniable importance of space to the development of prosperity on Earth, let us mention, for instance, the idea of mining the asteroids, which is not new. In fact, as Marshall Eubanks (2015, p.7) explains

in the years after 1898, and especially in the period after World War II, asteroid mining became a staple of science fiction. The asteroids were generally considered a dangerous or less desirable part of the solar system, and in a lot of stories, asteroid miners were rough-hewn men, something like the gold-prospecting '49ers in Western stories.

The reviving of the interest in asteroids nowadays, besides scientific curiosity, technological developments, fascination for space, is among other aspects, related to the context of extraordinary increase of the world population, which over the past 100 years has exploded from about 1.5 billion to more than seven billion (COGSWELL, 2014). More population certainly presupposes a greater search for resources, which, in turn, leads to an exploration of borders that once were considered improbable, such as the bottom of the ocean, or the increasingly deep drilling of landmines, in a clear challenge to the limits of science and technology. In this context of fading of the ‘forbidden’ borders and of technical improvement, asteroids will tend to be new steps in the search for resources. According to Steigerwald (2013, para. 2),

asteroids are lumps of metals, rock and dust, sometimes laced with ices and tar, which are the

cosmic leftovers from the solar system’s formation about 4.5 billion years ago. There are hundreds of thousands of them, ranging in size from a few yards to hundreds of miles across. Small asteroids are much more numerous than large ones, but even a little, house-sized asteroid should contain metals possibly worth millions of dollars.

Despite the wealth of minerals that space offers, it seems to be still premature, in the near future – mainly for technical and financial reasons – to start by extracting metals. Instead, experts like Chris Lewicki (2015, para. 2), argue that “in order to operate mining machinery on asteroids, humans need to first learn how to extract water from them”. Now, Lewicki (2015, para. 2) poses a question that is at the same time curious and pertinent in this regard: “But who needs water if asteroid mining is destined to be remotely-operated? Robots don’t get thirsty, after all?”. On a first stage, the water from asteroids will tend to serve the needs intrinsically linked to space missions. Indeed, “it currently costs nearly \$2bn per year to launch enough water – six tons per person – to sustain the six astronauts aboard the International Space Station” (SIEGELBAUM, 2014, para. 7). On the other hand, water allows multiple uses: it can be drunk, converted into oxygen and even into fuel for spacecraft. In this sense, Lewicki’s observation may not be inappropriate when this expert suggests that the fact that asteroids have low gravity can make them ideal platforms for the taking-off and landing (which does not require too much energy) of spacecraft.

Another positive aspect is the fact that “[asteroids] prevalence and proximity to Earth make them valuable potential way stations for refuelling on longer missions into space” (SIEGELBAUM, 2014, para. 11). These are actually good news for the success of bold and long-lasting space ventures, such as the race to Mars. To be able in the near future to refuel in space, or convert water into breathable air besides, of course, being drinkable by astronauts is a revolutionary landmark in space travel. The weight issue will no longer be a problem that limits the autonomy of space missions, of fuel or of the time spent away from Earth, since, if what the experts predict becomes true, the asteroids will provide the necessary tools to ensure that space exploration will go even further, maximising all human and technical potential.

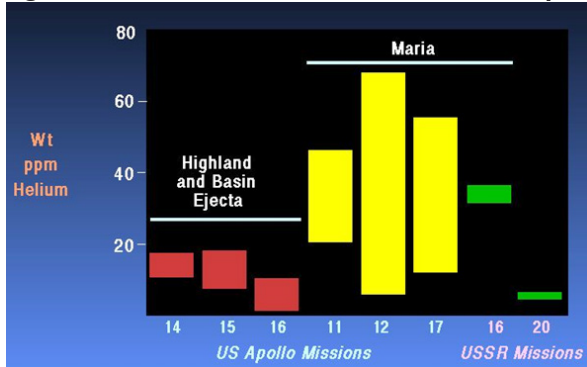
Despite the wealth in various kinds of asteroids, China seems to be particularly interested in what allegedly exists on the Moon, from gold, iron, to platinum and tungsten. But the resource that captivates more Chinese experts, given its extraordinary energy potential, is a gas called helium-3 (He-3)<sup>3</sup>. In fact, China being faced with

<sup>3</sup> According to Midgeley (2014, para. 5-7), “the helium-3 (He-3) is a lighter version of helium-4, the gas that makes balloons float because it is lighter than air. But while the latter is ubiquitous on Earth, He-3 is comparatively rare. This is because, while He-3 is continually being emitted by the sun, very little reaches Earth’s surface thanks to our planet’s magnetic field and thick layer of atmosphere. The moon, on the other hand, has no such impediments and has been accumulating



a context of huge energy needs – and the use of coal is not desirable due to the extraordinary pollution that batters the country – it is not surprising that “the leader of Beijing’s space programme has said generating power via nuclear fusion using He-3 could solve energy demand for 10,000 years at least” (MIDGLEY, 2014, para. 9). Dominic Midgley (2014, para. 11) even defends that “by mining He-3 from the moon and using it to create electricity Beijing would not only solve its own looming energy crisis but would also attain the sort of status worldwide Russia’s domination of gas supply gives it in Europe today”.

**Figure I - Measured Helium Content in Lunar Samples**



Source: Schmitt (1996).

For now, the issue of mining, processing and transport of helium-3, is in itself complex not only at the logistical and technical level, but also in financial terms, since all these factors together would be extraordinarily costly (around billions of dollars). However – it should be clarified – there is a legal emptiness in terms of exploration of existing resources on the Moon, something that probably will draw the attention of the International Community in the next years, taking into account the growing interest in space, and, more specifically, in its humanisation. Such a legal emptiness – despite a United Nations Treaty<sup>4</sup>, signed by 102 states in 1967 to establish that no country can take ownership of the Moon – could in fact allow China to explore lunar resources. Nonetheless, in the short and medium term – for the reasons listed above – the issue of lunar resources exploration will tend to remain a project, nothing more than that.

According to Meyers (2015, p.193),

Currently, there are two outdated international treaties that attempt to adjudicate the use and exploration of space. The first treaty, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including

*the stuff in its lunar soil for billions of years. It is now estimated to have 1.1 million tonnes of reserves compared with Earth’s stock of just a few hundred kilograms”.*

<sup>4</sup> As this treaty established in its Article I, “Outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind [...]”. Furthermore, one can read in its Article II that “Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means” (UNITED NATIONS, 2002, p.4).

the Moon and Other Celestial Bodies (1968), is an archaic but influential agreement ratified by nearly all of the world nations that have successfully launched a shuttle into space. The second treaty, The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1979), was an attempt to reform some of the principles from the Outer Space Treaty that failed to garner popular acceptance because it was not signed by any nations with national space programs. While both treaties attempt to deal with many issues, including the ownership of celestial bodies, both fail to allow for the ownership and development of asteroids by government or private entities. Because they were written during the space race in a period of international distrust, it makes sense that these treaties would be concerned with tempering the race to establish sovereign control over celestial bodies. However, as space exploration shifts from being financed and controlled by national governments to being financed by private industry, these concerns may be less important.

## 4 THE MILITARY IMPORTANCE OF SPACE

The fascination with the unknown, the intriguing search for the *Are we alone in Space?*, or the permanent challenge of the laws of gravity and how far from Earth the human being can go, explains and motivates, among many other aspects, space incursions. But there are other factors, perhaps less evident, which can justify the high expectations and investments that various great powers dedicate to space research. In fact, the Space is itself a very large puzzle, but which may be useful, in a context of surveillance, spying, in short, of power, if by power we mean here, in particular, the domain of crucial information to the supremacy of one State over another. It is no coincidence that the Chinese space sector is subject to *People’s Liberation Army*<sup>5</sup>. Also, it is not by chance that the United States are suspicious of the true Chinese space intentions, as well as, it is not a minor coincidence the fact that the Chinese military strategists recognise that “the key to fighting and winning modern wars lies in the ability to establish information dominance” (CHENG , 2015, p. 2). And, to this end, China seems to have understood that the Space plays a fundamental role, since through the strategic use of satellites allows, in fact, the achievement of the various aspects underlying the information domain, which comprise “the ability to gather, transmit, manage, analyze, and exploit information, and preventing an opponent from doing the same” (CHENG , 2015, p. 2).

This issue of the use of Space for military purposes is very important to the United States, to the extent that they rely on the satellites for surveillance,

<sup>5</sup> In contrast to the Chinese program, the U.S. space program has been primarily civilian in nature. The United States’ Apollo mission ranks as the most successful noncombatant space program. It was carried out by the National Aeronautics and Space Administration (NASA). Conceived as a civilian project, the aim was to contribute to science and space exploration.

communication, navigation, among other aspects. And, in a broad sense, the air, sea and land navigation, as well as global communications, depend on satellites, in such a way that any nefarious use of Space would have drastic consequences for the world economy, in a context of technological interdependence. Let us recall, in this respect, what happened in 2007 when China held a successful direct-ascent ASAT<sup>6</sup> test against one of their own defunct polar-orbiting weather satellites. According to Kelso (2007, p. 321), “the test produced at least 2,087 pieces of debris large enough to be routinely tracked by the US Space Surveillance Network and the NASA Orbital Debris Program Office estimated it generated over 35,000 pieces of debris down to 1 centimeter in size”. These debris, which could have led to serious consequences, will dangerously linger in and travel through highly-populated low earth orbits for decades. As Joan Johnson-Freese (2013, para. 2) remarks, “the debris created by their ASAT test put everyone’s space assets at risk, including Chinese assets”.

But does the United States have reasons to fear the Chinese space advances? It is a complex issue, since the experts themselves are divided on the subject. For some, like Saunders, “over time, more symmetrical U.S. and Chinese military and civil dependence on space assets may produce more common interests in making space a sanctuary in the event of a conflict” (FEUBERG, 2015, para. 23). Underlying this vision there is the principle of mutual deterrence, which assumes a greater interest of Washington and Beijing in cooperating, instead of interfering in the operation of their satellites, both civilian and military. Others, however, like Fisher, are skeptical regarding the sanctuarisation of satellites. In fact

satellites is an attractive combat zone primarily because it offers very high political and psychological impact compared to the cost you pay for in terms of men and materiel.... Today, especially the temptation to attack the American superiority is far too great. I expect it will be used in any near-term conflict, especially should something occur in the South China Sea or Taiwan or the [Senkaku Islands, also known as the Diaoyu Islands] (FEUBERG, 2015, para. 23).

Judging by this last concept and in response to the question raised above, then the answer is yes, the United States should fear, or more than that, guard against the Chinese space advances. As justification of his argument, Fisher reports that in a Xi Jinping’s speech to a military audience in December 2012, “[he] has personally ordered services of the PLA<sup>7</sup> to prepare for space combat” (FEUBERG, 2015, para. 23). Other experts such as James Clapper, Director of National Intelligence, warned in 2014 the Senate Armed Services Committee, that “threats to U.S. space services will increase [...] as

potential adversaries pursue disruptive and destructive counter-space capabilities” (TADJDEH, 2014, para. 7). According to Clapper, “Chinese and Russian military leaders understand the unique information advantages afforded by space systems and are developing capabilities to disrupt the United States’ use of space in a conflict” (TADJDEH, 2014, para. 7).

In light of this reasoning, we easily understand the concern of the United States vis-à-vis the ‘space episode’ of 2013, the year in which China held a sounding rocket test at high altitudes. Although Beijing has officially declared that the achievement was only a scientific experimentation in order to “collect atmospheric data for the China’s National Space Science Center”, in practice, “U.S. defense agencies reportedly assess the launch was the first test of a new anti-satellite (ASAT) capability” (MURRAY, 2013, p. 2). For experts such as Kevin Pollpeter, such a space achievement reveals that “China’s Anti-Satellite capabilities had expanded, and could help enable China to threaten satellites such as GPS and communication satellites in medium and high earth orbits” (FEUBERG, 2015, para. 15). In turn, Zachary Keck (2014, para. 9) reinforces the idea by stressing that “China would seek to use the ASAT missiles to knock out U.S. satellites in order to degrade its C5ISR<sup>8</sup> capabilities, rendering distributed U.S. military and allied assets unable to communicate or share information”. Regarding the Chinese space doctrine, Gompert and Saunders (2011) report that the *People’s Liberation Army (PLA)* demonstrates a preference for the so-called *soft-kill*<sup>9</sup> over *hard-kill*<sup>10</sup>. In practice, “soft-kill attacks are seen as potentially more deniable and having fewer diplomatic consequences than *hard-kill* attacks, which may generate debris or involve kinetic attacks on facilities in third countries”.

Although the Chinese space doctrine is inspired to a large extent on that of the United States, they are both marked by different paces, different priorities and strategies. China arrived quite late to the space chess, as said before, but this does not prevent – on the contrary – the country from (successfully) working hard to retrieve the technological delay that separates it from the American know-how and space prowess. Many of the recent space achievements undertaken by China have been achieved, it must be noted, in the last four decades by the United States (and, to a large extent by the former Soviet Union as well). Therefore, the Space is relatively new to a China that wants to discover it. Not so much for an America that somehow fell into space apathy, while the *budget* is channeled to other areas, to the detriment of space

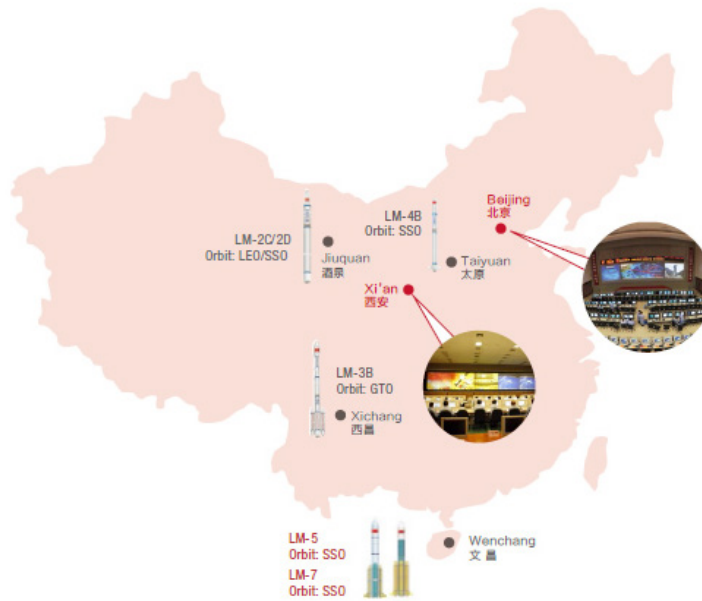
<sup>8</sup> C5ISR is defined as Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, and Reconnaissance.

<sup>9</sup> Which temporarily or permanently denies use of space assets by means such as jamming, blinding, or cyber attack.

<sup>10</sup> Kinetic attacks with the potential to generate significant amounts of space debris that might affect China’s own satellites.

<sup>6</sup> ASAT is a military abbreviation for anti-satellite weapon.

<sup>7</sup> PLA stands for People’s Liberation Army.

**Figura 3: Processos do grupo de processos de iniciação**

Fonte: Project Management Institute (2013, p. 425).

research. This fact has triggered harsh criticism and even protest letters, by American astronauts who fear that the race for the space is now given to other actors, among which we highlight China.

It is interesting to note that if the Chinese prioritise the development of manned missions, the United States, in turn, seem more supporters of a robotic exploration of Space. On the other hand, if the Moon and the *Low Earth Orbit* are important parts in the Chinese space program, the Government and the American public are more sympathetic to a deeper exploration of Space (of course, Mars is important both to China and to the United States). But the differences are visible even in terms of space stations. While China wants to build its own space station, the United States has cooperated and relegated in the Russian space program its access to space, in a perspective of monetisation of costs. Until recently, because the invasion of Crimea has raised serious questions in American Defense sectors about to what extent it wouldn't be better to abandon the dependence on the Russians, after all, unpredictable, as shown by Crimea, or more recently, by the Russian military involvement in Syria. Another curious difference is that if the United States has preferred the advance of private space exploration, also in a perspective of monetisation of costs, the Chinese space program, in turn, is largely dependent on the *People's Liberation Army (PLA)*, i.e. it is highly militarised. According to Fisher (2015, p.1), "the PLA's apparent goal is to exercise denial and then dominance in *Low Earth Orbit* and then to extend control into the Earth-Moon system". According to Fisher, "the PLA's projection into space is an integral part of China's development of military capabilities to dominate the Asia-Pacific region, and then to project power globally into the

2020s and 2030s" (FISHER, 2015, p.1).

## 5 FINAL REMARKS

It would be demagogic to state that Chinese politics is merely of a power with a collective project of peaceful rise within the International Community, among other aspects, through trade as a source of peace and prosperity. That is, maybe, Beijing's official position. But we must go further, beyond mere official and institutionalised rhetoric. No matter how discreet, subtle and peaceful the contours of the Chinese *going abroad* are, the truth is that Xi Jinping's China is both pragmatic and assertive. It would be inconceivable that such a great power from the economic, demographic and territorial point of view, among others, did not care about pressing challenges, both internal and external. Topics such as food security, alongside the energy security, or even water scarcity, are national challenges, such as the one China principle. To ignore such factors is to disguise reality. It is therefore in the light of Chinese national interest, that we should analyse certain foreign policy decisions of the country, such as China's race for space. Having said that, it will be interesting and promising, from an academic point of view, to follow the evolution of the political ambitions of China's space projects, in particular their impact in the way the regional States – with which China keeps maritime and/or terrestrial disputes – and extra regional, such as the United States or Russia, perceive and associate the Chinese space advances or the force game in the regional and global arena.

The next years will be decisive in that they will allow us to understand how far China is willing to go in defending its national interest, more specifically in its effort to ensure that there will be no shortage of mineral and

energy resources to its population, the largest in the world. In this sense, it is not unreasonable to speculate that the audacity and assertiveness of Chinese ambitions and space policy will depend not only on the development of the perception that the Chinese Communist Party will reveal regarding the urgency of the search for resources, but also of the future of events linked, in turn, to the perception that the Chinese will have in what concerns their leaders. More dissident than ever towards the permissiveness of the Party in relation to the environmental negligence that undermines the economy and reaps the lives of millions of Chinese (contaminated water and soils, highly polluted air, etc.) it is not surprising that if the Party does not find a noble ideal amply legitimiser and able to divert the Chinese attention from serious domestic problems that the country is facing, then sooner or later, it will run the risk of falling. Space can be one of those noble ideals susceptible to raise the pride of a China wounded by the history of humiliation of which it was the victim by the West and Japan, keeping the flame of the Party as a unifying entity and convergence engine for progress.

However, the coming years will also help us to understand if the sanctuarization of Space is an indisputable dogma forever, or a mere transient convergence of States, to the detriment of economic imperatives (mineral and energy). In a game in which China is not alone it will be interesting to understand if the Moon is untouchable, as the United Nations established, decades ago, or if, as a last resort, any State or private actor may take ownership of the Lunar energy wealth. And, finally, it is for the space that we must focus our attention in order to realise China's interest in improving anti-satellite weapons, capable of neutralising the enemy's advances in any war, by depriving it of access to its sources of information and of operational control over its armed forces (since these advances highly depend on strategic information and positioning given by satellites). The asymmetry of China's power vis-à-vis military hegemony of the United States or of a coalition of States requires alternative strategies, such as the intelligence to confuse the enemy, or to deny the control of its own resources. To this end, Space and cybernetics can be complementary and alternative strategies in a conflict that opposes China to any State or group of States. This is only speculation, in fact, since we share the assumption that in geopolitics and geostrategy nothing is established, to the extent that the interests of States are in permanent mutation.

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