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Research Article

BRICS space diplomacy and response of non-Western countries: the inscription of Neo-Functionalism

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Abstract

Outer space perseveres as a domain of contestation. In fact, the era of the early 2000s was also remarked to be embroiled in a 'second space race'. In this regard, in November 2019, NATO also declared outer space as its operational domain. In contrast, BRICS formally committed in 2021 to the prevention of an arms race in outer space. Russia and China agreed to cooperate on a permanent manned lunar base and are investing heavily in their space programs. This is ringing bells in Western-led established order. Once the International Space Station (ISS) is decommissioned in 2022, China's space station, if constructed in 2025, will be the only functioning global space station for which Beijing is already seeking cooperation from partners. Interestingly, NASA's legislation prevents it from collaborating with the Chinese National Space Agency. This article endeavours to understand the scenario with a two-fold focus: will the emerging countries like BRICS follow the footsteps of the West in militarizing outer space? how countries other than China use this opportunity to attain a desirable position in the international order. The study provides an insight into how non-Western countries have secured a place in attaining a considerable position in outer space.

Keywords: BRICS, outer space, space diplomacy, international order, space militarization, second space race.

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1. Introduction

The West recurrently assesses outer space from the prism of security (Williamson, 1987). In 2019, the North Atlantic Treaty Organization (NATO), affirmed it as an operational domain, allowing it to be included in its defence posture (NATO's approach to space, 2021). In other words, it can also be ascertained that, NATO is attempting to maintain the long-standing US dominance in outer space technology. According to NATO's overarching space policy released in 2022, a Space Centre at Allied Air Command in Ramstein, Germany, and a Centre of Excellence for space in France were also established to achieve this goal (Hadley, 2022). It may not be wrong to interpret this development as an evolution towards newer realities for outer space.

Meanwhile, the BRICS countries also engaged in an agreement in 2021, ensuring cooperation for satellite data sharing amongst themselves (Economic Times, 2021). This agreement was significant in terms of multilateral cooperation amongst the countries while enabling a virtual constellation of specified remote sensing satellites and their respective ground stations (Geospatical World, 2021). They endeavour to shape cooperation in the science of space technology to ascertain a major chunk of an industry worth $300 billion (South African National Space Agency, 2021). Tian, Secretary General of China's National Space Administration, told Russian think tank Sputnik that, the constellation of BRICS countries marks just the beginning. It will be a basis of collaboration that will be expanded to telecommunication, space science mission, and also navigation system cooperation (Voice of America, 2021).

It is worth mentioning that the posture of BRICS countries towards outer space is not security centric. In the 13th BRICS summit, it was specified that, the established powers need to commit towards preventing the space arms race in order to enhance the safety of operations in space. This is possible by facilitating the UN Peaceful Uses of Outer Space (UNCOPUOS) mandate. The countries also stressed on committing to restrict arms race in the said Summit. In this summit, the countries also stressed the need for a legally binding instrument for the States, which restricts the arms race in the outer space (13th BRICS summit, 2021). They affirmed that the prevalent framework which governs the space activities is almost dormant in checking practices of the industries and evolving technologies, particularly related to militarization in space.

The question is, do the BRICS even matter in outer space activities and governance? The answer partly lies in the individual global standing of each member country. China and India both have space programs with ambitious notions. Meanwhile, Russia remains the only reliable source for the US after its space shuttles became redundant in 2011. The US also depends on the propellant module of Russia to keep and maintain International Space Station in orbit (Harwood, 2022). It is an industry worth $100 billion with a laboratory dedicated to research above the earth almost 250 miles away. The spacecraft of Russia Soyuz is used by the US to transport astronauts on a round trip from the space station. Until the year 2018, NASA along with its partners were to pay a sum of $81 million per astronaut to Russia (Business Insider Report, 2021).

In 2003, China was declared to be on the third slot of countries which had sent an astronaut to space, being behind the US and Russia (Reuters, 2017). In this regard, the Chinese President

Xi Jinping, also stressed on declaring China as an established space power (Kharpal, 2021). Following this, there was no turning back for China, as it desires to man the moon by 2036 as it only managed a 'soft landing' on the moon in late 2013. Meanwhile, India was also successful in launching 104 satellites just in one mission, which it declared as a world record (Kharpal, 2021).

For the US, the space activities of such countries, especially China, were in fact a security threat. It banned NASA from facilitating the Chinese in any space activity or providing assistance (Grieco, 2022). The International Space Station is currently approved to operate through at least December 2024. The ISS was the sole station in world orbit for the last twenty-two years. To recall, it is a project initiated with the collaboration of five countries, namely EU, Canada, Japan, Russia and US. Now that the Tiangong space station of China is undergoing construction, the ISS will face competition in the lower orbit of Earth. The first module of Tiangong was completed and launched in April, 2021, whereas the next two will be launched later in 2022.

In any case, it is not far-fetched to say that the development in outer space marks the beginning of a new era. It after all goes way beyond satellites. In fact, many military thinkers consider space a kind of final frontier. It is widely known that the military relies heavily on surveillance, communications and a diverse array of operations. In June 2018, then US President Donald Trump had also directed the Pentagon to start the procedure that oversees the establishment of a force for space as one of the branches of the US Armed forces.

Nonetheless, it merits mention that, the militarization of space is nothing new, and ought to be a major part of the US and West national security agendas. Since the administration of Eisenhower. It was propelled dramatically after the Cold War, which has now brought the world to face three main kinds of space weapons: ground weapons that can attack space targets (such as lasers capable of interfering with satellites); space weapons capable of attacking other assets in space; and also, space weapons that can attack targets on earth. In 1967, Washington and Moscow signed the Outer Space Treaty, basically aimed at preventing weapons of mass destruction from being placed outside the atmosphere. However, there still remains a legal vacuum regarding other kinds of space warfare (DeSombre, 2000).

Hence, it will use the content analysis technique of qualitative data available on the subject. Particularly, the BRICS Ministers' statements on space diplomacy will be analysed. The article's main objective is to analyse the evolution of international order, which is now being determined congruently, in outer space, having multilateral underpinnings. This will be viewed through the assumptions of Neo-Functionalism and its concept of Spill-over, which suggests that cooperation in one field will by default facilitate cooperation in other fields and sub-fields. this article will endeavour to analyse that, as the countries other than the West endeavour to increase activity in outer space, the West will consider it as a bigger security threat. There remain lacunas in the current global governance mechanisms which do not cover technological advancements and inclusion of the private sector. Hence, countries like China and Russia, from the forum of BRICS, stress the need to maintain a peaceful multilateral approach towards outer space and call for new governance mechanisms for newer realities of outer space. This can be viewed through the assumptions of Neo- functionalism and its concept of spill-over. Nonetheless, the article will provide an insight into how countries other than the West have secured a place in attaining a considerable position in outer space.

2. Literature review

The literature available on the subject can be divided into three main contours: space militarization (security centric), regulate space activity (legal) and multilateralism in space (strategic). Currently, only three countries are capable of maintaining a military presence in space: Russia, US and China. The Space Force of the US does not have a military base in outer space but has a base in Qatar. It is similar to an espionage operation targeting Iran through space technology. Hence, it is an example of having a strategic asset of achieving personal geopolitical space through space technology. According to a briefing paper published by the House of Commons, UK in 2021 that the practice of using space as a military domain is decades old. Although it was limited to deploying military arsenal which was non-offensive, this included navigation, surveillance, imaging and communication satellites. However, it is not a hidden fact that, the space has turned into a domain of contestation. It is viewed as a military domain, which facilitates countries in enhancing their capabilities which ensures security.

Hence, there is a key difference between the militarization of space and its weaponization. According to The Diplomat in a paper by Vasani (2017), weapons are placed in the outer place or on the heavenly bodies, for the purpose of attacking or destroying targets in space, amounts to its weaponization. These weapons should have a capacity of destruction. Many experts like Matthew Mowthrope (2004), Bruce Deblios (2010), and Johnson Freese (2019), suggest that, even weapons placed on the ground which are devised to attack assets in space are also space weapons, although they are not in technical terms weaponization, as they are not placed in orbit. However, another author Freese provides a counter argument that, any weapon going in space and reaching targets, like the technology of hypersonic weapons, is also weaponization of space. There are numerous US missile defence systems, which are being made within this framework, as they are to serve two goals: ballistic missile capability and destroying assets in space.

Currently, there is no evidence of any weapons in space. However, both China and US are in the process of developing technology with being anti-satellite. Meanwhile, the US while anticipating weaponization in space has developed a shield against ballistic missile. A defence analyst, Bruce defence (2008), in a Council of Foreign relations special report, suggested that the US missile defence is nothing short of a full spectrum dominance. Nevertheless, countries in the garb of self-defence are in the process of developing offensive technologies. One way the technology is to protect the interests of a state in space, while the other way around the same technology has the ability to destroy satellites. In this regard, private contractors are busy innovating technology and trying to make sustainable satellites. Nonetheless, although countries like Turkey are also accessing outer space technological advancements however, the space race may ensue between the major powers.

China has maintained it sees outer space as a kind of asset that is shared by all humanity and has consistently advocated for its peaceful use. Of course, only international cooperation and a lot of progress in international law can avoid or at least minimize the militarization of space and further tensions. In today's world regional and global powers compete geopolitically not only over the surface of the earth but also beyond our atmosphere (Goldstein, 1996). In this sense, the space technology is now key to the very sovereignty of the nations. Space geopolitical dispute involves not only a technological and military race, but also many challenges pertaining to legal and legislative creativity, not to mention geopolitical creativity.

Thinkers such as Halford Mackinder and Nicholas Spykman created geopolitical frameworks for analysis regarding the physical and political realities of sea-power and land-power (Gowa, 1995). As engineering and other technologies advance, so shall a political theory of space-power emerge?

Today's space law largely resembles sea law - as understood by the United Nations Convention on the Law of the Sea (UNCLOS), for example. Beyond 200 nautical miles off-shore, lie the international waters, described by UNCLOS Part XI as "common heritage of mankind." Just like the deep sea, space is understood by the 1967 Outer Space's Treaty as a common heritage of mankind. Militarily and geopolitically, space is in many ways similar to the sea, but it also has of course its peculiarities. Sea law has evolved, and space law too will need to change in order to fully grasp the complexity of human activities such as the exploitable of asteroids and other space resources. And beyond the realm of outer space (basically a hard vacuum), lies the realm of the celestial bodies, which can themselves become yet another arena for geopolitical dispute.

The NASA Artemis program, which followed the US Space Force in 2017, aims to take humans back to the Moon, and even to establish a base or a permanent human presence there. Beijing too, in cooperation with Moscow, seeks to create its International Lunar Research Station by 2035. In the future, one could expect geopolitical and even military competition over resources on the moon. This also marks a remarkable advancement in Russian Chinese bilateral relations. "The sky is the limit", people used to say. In terms of future human exploration, it must be just the surface. In face of such complex developments, we need new international treaties pertaining to the issue of outer space, and we will also need new geopolitical concepts.

Third, multilateralism in space (strategic): The era of 1960's was overwhelmed with space exploration competition between US and USSR. However, the space of 20th Century, ensues a space between several countries. Mainly the emerging economies of Japan, India and China. Hence, the geostrategic dynamics of todays' space race is quite different. The era of 1960's was a major competition of communism and capitalism. Today, the competition is based on gaining economic advantage, for acquiring technology for mining rare elements from asteroids and the moon. What is same, is the pride of nations (Hornsey, 2022). These days, many private manufacturers have also dominated the ISS, and satellite manufacturing industry. Particularly, for telecommunication, weather monitoring and surveillance.

Mainly, Japan, China and India are competitors in space against the Western dominated outer space. Whereas, now ISS partners, are again considering moon exploration through humans. They plan to land humans on the surface of moon in the year 2024 and have also asked for the facilitation of private contractors in the plan (Bendett *et al.*, 2021). Meanwhile, other countries like India, Japan and China are also interested in human moon landings (Baldwin, 1985).

It is worth mentioning that it is only China's space program, that is independent of the other developing countries. It has managed to send several human missions in space and have developed two small space stations in the last ten years. Its mission named 'Chang'e even travelled on the other side of moon in the year 2019. Hence, declaring China as the first country to soft land a rover on that side of the moon. Meanwhile, Japan is also one of the countries which are also partners of ISS and has managed to send numerous astronauts in space. Also,

India has been able to send two lunar missions. It is now interested in its very own Space programme dedicated to human landings and expeditions in space.

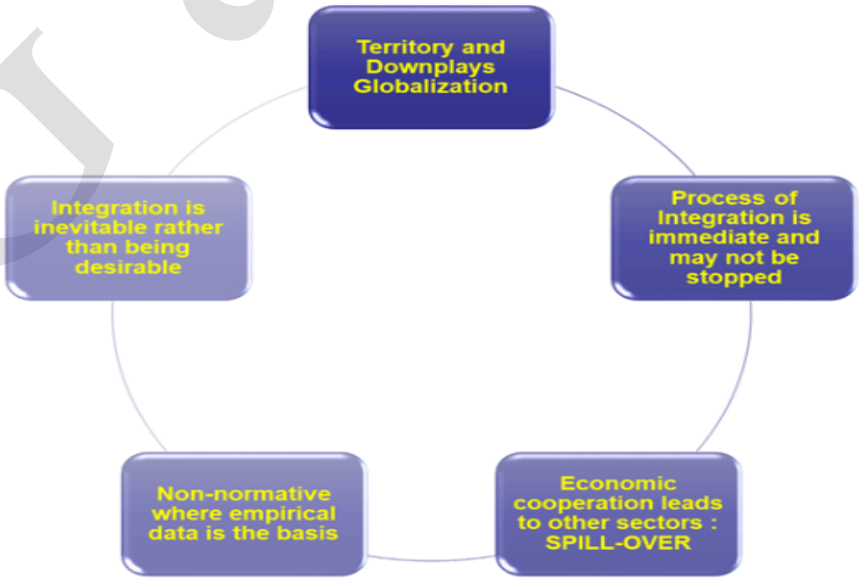
Hence, Asia is not far behind the West in reaching out in the outer space. They are part of a chunk of countries that have interests in lunar landings (Badie, 2019). However, even if a competition exists between these countries, it is of multilateral nature and nothing like the one in the 1960's. Meanwhile, it is also a fact that countries are still interested in technological advancements which allow them to evolve as a space power. These days it is more commercial than just being a strategic competition between the developing countries.

3. Theoretical and conceptual framework of study

The world has now evolved towards newer realities, in which there are numerous space powers other than the West (Bouchard *et al.*, 2014). Where China is on top of the list, many countries in Asia now have aspirations to reach the moon. This is also giving way to a new competition in Asia. The fact that regional countries: China, Russia and India, all three are part of BRICS, also brings forth the significance of this forum in outer space governance. Hence, in contrast to the era where only US and USSR had competition in space, there is an ensuing global competition for using space for various activities. This is an indication of how the global balance of power has changed over the past few decades.

Meanwhile, where countries are using their political differences to challenge each other in space, BRICS countries have opted to cooperate with each other (Chin, 2015). This cooperation may be viewed through the assumptions of Neo-Functionalism and its concept of Spill-over. As the figure indicates the main concept of Neo-Functionalism would specify that, despite the political and cultural differences of BRICS countries, once they started cooperating in the economic domain, the process led them to cooperate in other domains and areas as well, like the outer space. This is actually an integration which is inevitable and by default rather than being by design. As it is a non-normative process, the countries keep away their differences and downplay globalization keeping their own interests supreme (Cooper, 2014).

Figure 1: Main postulates of neo-functionalism



In this regard, China is persistently innovating its space programs and collaborating with Russia. They developed a space weather centre in Beijing, an important achievement for satellite operations and even ground pipe networks (Kobierski, 2021). Meanwhile, Russia has already collaborated with the European space agencies and have undergone numerous interactions in the name of space exploration (Myers, 2016). This is also a clear indication of how integration is inevitable once countries start cooperating. These three are also committed to bring back human expeditions on the moon although there is still room for further discussion on the process to be adopted. However, China has already declared to send scientists to the Moon by 2036. This will give China leverage as compared to Japan and India (Myers, 2016).

On the other hand, the fact also remains that for future development in space technology and integration, BRICS countries will have to collaborate with China (Shambaugh, 2004). This is true because, China's maiden mission in space was undertaken in the year 2003, and as already mentioned above, brought China on the third global slot, after US and USSR. Meanwhile, it was the first Asian country to have accomplished this task. It is worth mentioning that, China's intention to send manned space missions to the moon are focused on developing a space station in the lowest earth orbit possible. By the year 2022-2024, the construction is expected to be finalized. This is expected to turn it into the only space station available to world after ISS ceases to function (Shambaugh, 2004). Hence, China aims to keep an 'open to all' policy.

Despite of being a credible space power, India is not yet able to compete with China in any domain, particularly in its space exploration through robots. Hence, China is not only a country which is achieving historic milestones as compared to the 1960's but is also managing some global independent firsts (Cooper, 2014).

These achievements will help China in attaining a global standing of a country which is not only strong on the globe but is also technologically advanced enough to challenge Western hegemony in space. However, there is still lack of momentum in the trajectory. As, the West views it through the prism of security, hence China also was forced to think on these lines. In this regard, China demonstrated its destructive anti-satellite (ASAT) test in the year 2007 which also resulted in space debris (Arif, 2020).

In addition, there are other countries which are new in the space exploration domain. They have quite recently focused on streamlining resource towards space activities. For example, Iran and United Arab Emirates (UAE), are now eyeing missions to mars (Arif, 2020). These two countries, provide an example of understanding how the world has evolved from being Western centric to multilateral. However, the West views the aspirations of such countries through the political and geostrategic prism. As especially the US is still stuck in its Cold war mentality. It views Iran's aspirations as dubious and in fact supports the UAE in its activities (Hines, 2021).

The increase in the weaponization of space is undermining positivity of various nations attempting to become a space power (Arif, 2020). There are a couple of worldwide components, yet they have shown to be ineffectually attributable to the extremely changed security situation (Harris, 1994). ASAT capacities, for example, are innately undermining and hazardous, however none of the current worldwide systems successfully limit ASAT abilities (Hines, 2021). Additionally, a portion of the old discretionary instruments have become too sweeping in their understandings and subsequently they are not adequate to manage contemporary difficulties. For example, how can one characterize serene purposes of space for

sure is the cautious utilization of space? Presently, there are different continuous endeavours to fortify or even supplant these current components. Yet, given the present status of extraordinary power commitment, it is far-fetched that any action will come to fruition soon.

Nonetheless, the evolution of the global balance of power, and the rise of various space powers is bringing the world towards a newer space race (Deng, 1998). It depends on the West and particularly US to restrict activities of space weaponization and militarization both, in order to bring a positive turn in the space race (Nye, 2011). Contrarily, China will also endeavour to maintain its balance of power in space, where BRICS seems to be a viable forum with three established space powers, and in turn make the outer space a volatile ground (Rajagopalan *et al.*, 2016).

4. Methodology

The content analysis and descriptive method were used in order to understand the scripts of BRICS countries with regard to outer space. The BRICS Summit held in Russia, in the year 2015, was the one in which the leaders expressed their desire to enhance collaboration in sectors of space exploration. The declaration read that, these countries will facilitate each other in space activities and stress on peaceful means of technological advancements in this regard. They also committed to themselves for enhancing collaboration in domains i.e., navigation, and exploration in sciences of space (Ufa Summit, 2015).

With the content analysis of each BRICS country's space program, it was inferred that, these countries hold a commitment for peaceful space exploration and desire to become established space powers. In the points 26-59, the countries raised the necessity of peaceful space exploration They also expressed willingness for preventing space weaponization and an arms race and vowed for a global governance system for non-deployment of weapons and non-militarization.

BRICS countries undergo peaceful collaborative exercises related to space activity. Meanwhile, they also stress on the idea at different international forums, particularly at the UN sessions. They were able to set a mark in this regard, particularly in the mid 2005 when a Russian draft was offered which included the shunning of military equipment in space. In the year 2007, yet again a Chinese draft was presented at a UN session for demilitarization of space. Nonetheless, the US did not back these drafts and in fact provided counter arguments to them. However, today these countries have attained a much better global momentum and make highlights once they stress on peaceful usage of the space domain.

5. Results and discussion

The consortium and collaboration between the BRICS is quite a recent phenomenon, but the idea of such an integration is deep-rooted. Ever since the world economic crisis of the year 2008, emerging states have desired to combine against the Western led economic global framework. Furthermore, it didn't take some time before "the blocks" began to work out - multi-faceted collaboration occurred (Wade, 2014). In this regard, the outer space seems to be a considerate domain to further mutuality of interests. Similar to collaborating against the Western led economic framework, the monopoly of the West in the outer space was also considered to be challenged (Zakaria, 1998). Nevertheless, with the idea of attaining supremacy

in outer space, the World had very smoothly entered in to a 'second space race', particularly in the years 2003-2004 (The Conversation, 2018).

As discussed earlier, the BRICS Declaration of the year 2017 in Xiamen, stressed on the concept of having a secure and non-violent outer space, particularly in its points from 26- 59. However, it is important to assess whether these countries have the capacity to achieve this goal both individually and collectively. This would allow the World to witness a leap towards multilateralism. Unfortunately, the mutual cooperation among the BRICS countries in the outer space domain is slow (Zhang, 1995). The countries rather examine the capabilities of each other for invigorating the logic of their future relations (Adriana, 2014). However, proclamations are supplemented by something appreciable. Nevertheless, in terms of real cooperation, the list of their mutual projects is also exhaustive. Brazil hosts the Global Navigation Satellite System of Russia and is also in the process of developing a launching system with the help of Russia. Meanwhile, China and Brazil also underwent numerous agreements since the year 1998, which included remote sensing satellites in order to promote bilateral cooperation (El-Affendi, 2009).

In addition, India and Russia also collaborated for an educational satellite named: 'Youth Satin' in order to research on the flares of sun and how they influence the earth. Concurrently, the trilateral forum of IBSA (India, Brazil, and South Africa), which was instituted in the year 2003, also called for mutual exchange on outer space research (Peng & Tok, 2016). However, indeed the mutual cooperation of these countries also depend upon their individual space programs, which are discussed separately below:

5.1. Brazil

From the year 1984, The space agency of Brazil, has chipped away towards the development for a satellite which is disposable. There have been three send-off endeavours between the periods of 1997 to 2003, all came up in disappointment with the last (VLS-1 V03) killing 21 personnel when it detonated while on the platform after one of its four Solid Rocket Boosters (SRBs) was incidentally ignited. Brazil might be said to have begun situating itself as a spacefaring country in 1961 when its administration, being upheld by the US, first started the program of room investigation and planned the impressive commission at the national level, majorly evolved in to an institute for space research, popularly known as, INPE from the year 1971.

The era of the 1960s was in fact an impressive age for Brazil space exploration. It envisaged specific focus on events and related achievements owing to the country's geological significance. The country covers majority of ground in Latin America, long shoreline tropical weather, and major assets particularly the fact that the equator-line passes through it, provides better chances for being a space power. It remains a fact that, NASA also used Brazil for outer space exploration till the year 1977, which marked the launching of its own rocket in space, showing minimum reliance on the United States.

Since the space agency of Brazil was formed, it instituted self-reliant research in space cultivating integration among foundations that contain professes system for the development of activities in space. Brazil also made an association with the ISS and its agency while keeping control over its own laboratory for research. Its stations at ground also established a basic work

for supplementing and improving the national program dedicated to space research and development in this domain. Today, its agency dynamically symbolises satellites in the outer orbit of space, which is majorly for the purpose of weather surveillance and correspondences along the equator.

The main objective of the national space agency of Brazil, as outlined in the National Program of Space Activities for year 2012-2021 (PNAE 2012-2021) stresses on progressing towards achieving innovation in space in order to raise the societal life of Brazil and executing national approaches for dealing with issues like meteorology and other perceptions of earth. The activities in space invigorated development that in turn impact the society at large and also affect other industries.

5.2. Russia

Russia's current posture for managing issues in space can be termed as 'resurgence', particularly after its come back after its phase of disintegration. The actual dismemberment of USSR did have an adverse effect on its space program. From one angle it made new climate of business for Russia and consequently, an undertaking of getting sorted out an own foundation without any preparation was presented) then again, the circumstances for holding a reasonable lead in space were interlaced with monetary issues - the most solid method for keeping above water was to send off business satellites and take part in space the travel industry (productive however inadequate with regards to valuable open doors for self-advancement).

This deplorable standing may barely be achieved particularly after the first race to space between US and USSR. The previous USSR faced challenges but paved its way through them quite diligently. In the late nineteenth and mid twentieth hundreds of years a trailblazer of room investigation Konstantin Tsiolkovsky shared his idea of things to come of multistage rocketry. His suggestions in fact made considerable improvements in the rocketry research. From then onwards, the country become the pioneer of innovation, owing to some firsts like the first man in space in the year 1961, first test drive for the moon in the year 1959 and many other 'firsts'.

In the years of emergency, specifically in the years of 1990's, ceased Russia from achieving the direction of success. Meanwhile, from the years 2005-2006, it did not settle to repeat for making an extra effort, in addition to putting in effort on the family of 'Angara rocket' and the famous global route of GLONASS framework for satellites. Meanwhile, it sustained being a major partner in the ISS, in order to endeavour people and to resupply its space carriers. It claims a progression of assorted satellites for business utilize yet at the same time faces an absence of the ability to guarantee improvement of public logical cosmonautics. In any event, the political will and perseverance are probably going to conquer these difficulties and facilitate Russia for satisfying the arrangement of making a lead in increase of its moon landing program to the year 2025 and facilitating till the year 2030, a man on the moon

5.3. India

The main objective of the space program of India was to protect the space as a 'Common asset of Humankind' and also to protect the space framework for national interests. Following these objectives, India nearly figured out how to find eminent victories accomplished by the course of major race of space- between the USSR and US. Primarily, the Indian Space Research

Organization (ISRO) started to accentuate its space related program with the help of the USSR. Multipurpose satellites pointed toward giving media communications, remote detecting, ground tasks and meteorological payloads were a critical concentration for very nearly forty years. Then, at that point, not entirely settled to cause a more exact to notice devoted logical satellite missions. Following this, its orbiter in Mars named Mangalyaan in the year 2014, looked over the globe from a different focal point.

Earlier, this pattern, India successfully let go the norms of very basic investigation. In the year 1975, India launched its maiden satellite named 'Aryabhata', with the intention of attaining experience in developing and stationing a satellite in space. In the year 2008, it was able to complete a mission on the moon facilitated by extraordinary assets. However, it was with the help of US support for its Mission in mars in the year 2014, that was finally achieved. Nevertheless, despite of the shortcomings of the mission, India attained the first slot in Asia to have achieved a mission on mars and the fourth in the world after Russia, US and EU. The test, contrived on account of the collaboration between ISRO (liable for send-off vehicle, payloads and the specialty) and separate enterprises/academic local area (to chip away at discrete requirements for serving the send-off), exhibited a well-working instrument of public-private organization. It is likewise essential that the send-off was a truly "high-profile adventure": it came for an extremely minimal price. The mission was confessed to be the most affordable planetary one ever, in this manner, laying the ground for situating India as the serious supplier of minimal expense administrations. India draws in different entertainers to partake during the time spent upgrading its abilities: France will be sending economically hefty satellites, and Israel further developed boundaries on its satellites of surveillance. In the year 2016, India sent its reusable space vehicle (RLT-TD), encouraging more investigation of the route, which is independent, along with having hypersonic speed.

5.4. China

China is in fact one of the most committed and energetic among BRICS countries, with outer space exploration interests (National Bureau of Statistics of China 2012). In the meeting with CNBC James Andrew Lewis, a senior individual and head of the Strategic Technologies Program at the Centre for Strategic and International Studies, said that China portrays a kind of diligent attitude that allows the country to achieve the goals of manning the moon sooner than the United States. (Koehler, 2013). We may expect that, it will allude to many projects like orbiting the far-off side of moon and making a power station which is oriented towards the sun as repeated by Lt. General Zhang Yulin, vice president of the Armament Development Department of the Central Military Commission, in 2016.

The monstrosity and variety of endeavours mounted by the PRC additionally prompted China to turn into the third country to accomplish monitored space travel: China, also sent its first explorer in space in the year 2003, following with its first space walk in the year 2008. In the late 2013, the country also finished its first principal mission around the moon since the era of 1970's (Russian Analytical Digest, 2011).

Sequential advancements of the national program of China, allows it to attain the standing of a major space power. What's more, however, burning through multiple times less (OECD, 2013) as compared to NASA is its technical flawlessness, whether it is related to the development of a space station that rivals the ISS. This is significant because China is banned from docking at

NASA, a monitored mission to the Moon by 2030 or (un)crewed Mars investigation (2015-2060) (Russian International Affairs Council, 2012)

Specified aggressive activities can't however goal banters in the global field. While the USA faults China for becoming serene as well as counter space ventures (Stephen, 2014). China keeps on pushing the limits of advancement and, regardless, gets offers to sustain the strategic relationship between EU, China, and US, by setting the foundation of a bank for space research or even joint venture for sending off mission to mars (Vezirgiannidou, 2013)

To summarize, China has demonstrated to have an extensive positive encounter on the plan and is allowed to pick its either agreeable or autonomous way - at any rate, it can contribute globally while chasing after an unequivocal political objective of "the incredible recovery of the Chinese country"

5.5. South Africa

The era of 1960's to 1993 is significant for South Africa's space exploration program (Schmitt, 2006). Since the era of 1980's the Government as being chipping away towards a space launch and finally managed to figure out the way to put a foundation of a test range rocket. After the year 1994, South Africa managed to lay focus logically on outer space research in form of an institute, council and test flights (Doyle, 2012). In the year 1999, it managed to launch its satellite Sunsat- 1 from the Vandenberg Air Force Base, which considerably managed a lower orbit circle and popping the capability of its space organization. The satellite which followed in the year 2009, was sent off from Kazakhstan. It was the result of a program of three years pointing towards the culmination of a full-spectrum mission in space. However, its main goal was to first allude towards streamlining strategic resources and not just the essential ones.

The future goals in the national policy of space in South Africa depicts aggressive notions. As earlier: it takes a stab at having a completely settled space program with full-range space application administrations and items to be turned to by both neighbourhoods and global clients. This included the production of sensors, communication and perception satellites working towards the needs and desires of regions, for instance, food security, fiasco the board and land-cover planning (Hurrell, 2009).

What else does South Africa often think about while fostering another portion of exercises? The public space strategy sent off in the year 2009, made it clear: South Africa is committed to utilize outer space for peaceful purposes and national cause for help of all humanity. It desires to benefit from getting into global supply chain of aviation and taking interest in the info economy and converting outer space related results of the usual space (Edward, 2009). The existing framework of the nation and experience acquired alongside a significant labour force permit South Africa to assign itself as the local centre of room science and innovation which might be utilized with regards to reinforcing attaches with space-faring countries (Stephan, 2011).

6. Conclusion

Nonetheless, it can be accepted that, there is a major difference between the direction and history of space programs of BRICS countries (Li & Wang, 2010). However, it should not be

considered as a limitation to overcome. The positives of their individual capabilities can corroborate their mutual strength (Li, 2016). This includes their infrastructure, geographical characteristics, research in science, and partnership in the public and private domain. It is important to collaborate strategies for overcoming replication of their technologies and flow resources for fundamental problems in outer space technology. They should express their readiness for multilateral cooperation.

However, it is quite significant to analyse the relations between China and Russia (Niu, 2015). As mentioned earlier, China was majorly backed by Russia in its space aspirations. Newer deals were reached by the year 1992 (Roulette, 2020). After Russia was faced by Western led sanctions in the year 2014, China and Russia revived their space cooperation. Russia needed the replacements of US made electronic components and China needed a stronger partner in emerging as a space power. Once their interests collided, they started nurturing each other's programs.

Hence, it may be ascertained that all the countries of BRICS, are currently engaged in space exploration, regardless of what they want to achieve (Butchard & Mills, 2021). This is important for the five countries to sustain not only as global leaders but also as dominant regional ones. They are committed to the concept of multilateralism and tend to pursue space exploration as a means of achieving newer standing for this phenomenon. However, it is high time that these countries stress on mutuality of interests and focus on collective good and let go of individualism.

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