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HIGH SKY – LOW TENSION: CAN INDIA AND CHINA FIND COMMON INTEREST IN OUTER SPACE?

Abstract

Cold War rivalry spilled into space when the Soviets launched Sputnik in 1957, leading to space being recognised as the fourth domain of warfare. As the monopoly of the US and former Soviet Union eroded, it created space for new actors to emerge from Asia, where China and India due to their investemnts in space technology as early as 1950's had a significant headstart. The paper traces the evolution of the space programs of both the Asian countries and identifies how they are tailored to meet their aspirations to become global space powers. Against the backdrop of competitve cooperation which charecterises their overall bilateral relations, the paper assesses the trends in their national space programs to predict whether Sino-Indian relations will shift towards confrontation or cooperation. In view of the similar ambitions of both these countries in space, the paper conlcudes that there is scope for cooperation as well as competiton and which path will be adopted depends largely on their national strategic interests and further development of their fututre projects.

Keywords: India, China, Space, Diplomacy, Cooperation, Competition, Technology, Geopolitcs, Asia.

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INTRODUCTION

Even during the peak of bipolar competition between USA and USSR during the Cold War era, there was a recognition that Space was a common heritage of mankind, a global common, which was reaffirmed in the Outer Space Treaty in 1967.[1] Nevertheless, despite the recognition that space was open to peaceful use by all countries, most of the Asian countries during the first two to three decades of space era were not in a position to make significant investments in space "from the point of view of catering exotic ideas like fulfilling the 'human curiosity'" (Lele, 2013: 18) due to their socio-economic backwardness. However, with the growing acknowledgement that space assets have inherent strategic value in both civil and military spheres and the significance of satellite technologies to development, Asian states have successfully started expanding investments in space technology to harness space power. Although historically for most Asian states the focus of investments in space has been for societal welfare purposes, a holistic view of their space programs reveals their strategic dimensions. By viewing space power as the "ability of a nation to exploit the space environment in pursuit of national goals and purposes and includes the entire astronautical capabilities of the nation" (Lupton, 1988:7) the borderless outer space environment automatically gets transformed into a war-fighting domain – alongside air, land, sea and cyber space. With the rising number of private commercial space industries, dual use nature of space technology the environment is ripe for multiple competitions (Freese, 2018) and the prevailing legal framework remains inadequate and has no effective system for conflict resolution.

Asia is home to three established space powers – Japan, China and India – apart from which Iran, Israel and North Korea have demonstrated their capabilities as space powers by independently launching satellites into orbit and now aspire to reach the moon thus giving way to new competition in Asia (Rajagopalan, 2016). Driven by national ambition, geostrategic tensions and burgeoning economic opportunities, Asian countries' space capabilities are developing at an astonishing rate (Quintana, 2017). Asia represents a complex geopolitical reality with the presence of South Asian countries whose relations are dominated by political mistrust and border dispute, historic tension between the two Korea's, Japan-China strained relations,

1 International law regarding outer space outlines the broad principles with regard to human activity in space. Treaties and conventions are the main source of space laws. Apart from Outer Space treaty, there is the Convention on International liability for damage caused by space objects, Convention on registration of objects launched into outer space, Agreement governing the activities of states on moon and other celestial bodies etc.

strategic competition in Indo-China relations making security situation extremely precarious. Added to this, the quest for space power with the proliferation of actors, makes the "space race" of the 20th century, which spoke of competition between two major actors, inadequate. However due to the late entry of many Asian states to this race means that their space programs are still in a nascent stage but are rapidly evolving. The launch of Bangabandhu-1, Bangladesh's first geostationary satellite, to orbit makes it the fourth country in South Asia after India, Pakistan and Sri Lanka to do so is proof of such rapid evolution even in relatively backward countries in Asia post the end of Cold War. Nevertheless, the big three having been in the space race for over four decades have much more developed capabilities and thus shape the narratives of the "Asian Space Race". On February 13 2008, the famous TIME magazine published an article titled "The New Space Race: China vs. US" which reported: "Some analysts say that China's attempts to access American space technology are less about boosting its space program than upgrading its military. China is already focusing on space as a potential battlefield" (TIME, 2008). In the same year, on October 21, following India's successful launch of Chandrayaan-I, TIME reported "India gains on China in Asia's Space Race" (TIME, 2008). This launch came only a year after China launched its first mission to orbit the moon. Both India and China have amped up their space programs, and in that process outer space is increasingly becoming a tool to conduct regional diplomacy. South Asia is increasingly becoming the theatre for contest between China and India for influence and both countries are using their advanced space programs to offer services to countries in the region with the goal of developing both influence and goodwill.

The paper assesses issues related to Indo-China space diplomacy through the theoretical lens of security dilemma. Given the inherent complexities in the relations between these two Asian giants marked by both cooperation and competitive, it cannot be categorized into neat binaries of friend and foe. The central tenet of security dilemma is that due to the archaic nature of the state system, each state is ultimately responsible for its own protection and the only way to assure this is through expansion of one's national power. Although the goal remains one of mutually desired general security, the quest of the state for supremacy ends up compelling their adversaries – especially neighboring states – to take measures which enhance their own security. In the process, in a common search for security in an anarchic world, compels both powers to make moves which ultimately result in both countries feeling less secure. Therefore, a security dilemma arises out of actions taken by a state to enhance its own security, which in turn compels the other to increase its capability to forestall any possible attack in the future.

The establishment of People's Republic of China and the birth of India as a nation took place parallelly and during the early years was characterized by bonhomie where the strong anti-imperial sentiments in both countries was seen as paving the foundation for a solid friendship. However, relations took a sharp turn downwards after the border dispute came to the fore which culminated into the Indo-China war of 1962 where India had to face a humiliating defeat. It took almost three decades for China-India relations to recover which paved the way for pragmatic cooperation between the two countries together with strategic competition. This form of "competitive cooperation" between the Asian giants is seen as symptomatic of a security dilemma, where both countries have been steadily expanding trade ties on one hand while also arming themselves in case of a possible armed attack from the other. The complicated unresolved border dispute further aggravated the security dilemma, as moves such as military build-up or infrastructure development on either side was seen through the lens of suspicion. This turbulent relationship played out again during the Doklam standoff in 2017[2] which pushed the two Asian powers to the brink of war but ended on a promising note with candid talks which ended with both sides vowing to create favorable conditions for development of ties (PTI, 2017). In less than a year since the standoff Narendra Modi and President Xi met for a two day "informal summit" in Wuhan which led to fruitful discussion on vital issues indicating the desire on both sides to take the relationship forward despite differences.

Both sides realize the inherent complexities in managing a multidirectional relationship but also understand the need for cooperation evident from Indian External Affairs Minister Jaishankar statement "differences should not become disputes" on his three day visit to China to his Chinese counterpart Wang Yi. Both sides are intent on finding areas of cooperation globally as reflected in the second informal summit at Mahabalipuram in 2019 where both sides carefully avoided bold decisions on bilateral matters but reiterated terrorism as a common threat and denoted their intent to make joint efforts on a non-discriminatory basis (Kondapalli, 2019). Yet, this bonhomie proved to be short-lived as Sino-Indian relations reached one of their lowest points following border skirmishes along their disputed border in the Himalayan region (BBC, 2021). The cross-border firing, which

2 The Doklam standoff began on 16 June 2017 after the People's Liberation Army began building a road in area claimed by Bhutan. The Indian troops intervened to stop the road as it posed a security risk to Chicken Neck, the narrow corridor connecting India with its north-eastern states.

left at least 20 Indian soldiers martyred and an unconfirmed number of fatalities on the Chinese side disrupted the uncomfortable status quo where no bullets were fired in the region since 1975 (Peri, Haidar, Krishnan, 2020). At the time of writing this paper, the border standoff continued but disengagement talks through diplomatic channels continues but hopes for an early settlement have diminished.

India sees Chinese moves in South Asia with suspicion as being directed towards reducing New Delhi's influence in its own neighborhood. Beyond South Asia, in the Indian Ocean region – India further sees Chinese maritime investments in strategically important places such as Sittwe and Coco Islands in Myanmar, Hambantota in Sri Lanka, Gwadar in Pakistan and other investments in Maldives, together with the rapid modernization of the PLA as an attempt to limit India's own power projection capabilities. This is playing out against the backdrop of growing convergence between India and United States, at a time when Sino-U.S. competition is intensifying which the Chinese see as active participation in "anti-china" activities. For Beijing, Tibet remains a core issue and India's relations with Tibet continues to remains a contentious issue in Sino-Indian relations (Chellaney, 2014). Aggravated by historical mistrust, both sides feel threatened by each other's moves which contribute to a spiraling security dilemma.

Due to geopolitical realities and border disputes, differences between China and India are bound to exist where issues such as sovereignty, trade imbalances, and regional security are significant thorns which are not easy to address. However, the existence of a security dilemma does not make cooperation impossible, but implies that cooperation takes place "under the shadow of the security dilemma" (Garver, 2002). This is best exemplified in the Sino-U.S. relations in the space sector. Both countries have made significant investments in space technologies, which drives security dilemma, but does not necessarily make impossible, much less, undesirable cooperation between the two countries.

DEVELOPMENT OF INDIA'S SPACE PROGRAMME

India broke away from the shackles of British imperial rule and emerged as an independent nation in the international arena in 1947. India's growth as a nation paralleled the intense Cold War competition between USA and USSR for influence which extended into outer space as well. The launch of the world's first artificial satellite, Sputnik 1, by USSR in 1957 took the world by storm which was subsequently followed by many other firsts such as the first solar powered satellite, first communication satellite etc. In the midst of this superpower space war, India's first Prime Minister and architect of its foreign policy, Jawaharlal Nehru, steered a non-aligned[3] path which effectively allowed Indian space scientists and engineers to obtain training from both these countries without compromising its own independence. Nehru's personal encouragement to developing an indigenous base for space technology despite having inherited an impoverished nation with high levels of poverty, illiteracy, unemployment, came from his immense faith in the transformative power of science and technology which would serve as a catalyst to development for a backward, conservative society. However, the massive socio-economic problems India faced also meant that financing the building of suitable organizational infrastructure for advancement in science and technology was a mammoth task. Dr. Homi Bhabha, the pioneer of India's nuclear energy program, and Dr Vikram Sarabhai, a nuclear physicist with wide array of interests, played a personal role in development of India's space capabilities against these odds. Both of them were under no illusions that scientific and technological self-determination was a distant goal for a developing country and immediately had to "be imposed on or grafted onto" (Bhatia, 1985:1014). As Bhatia further notes, they were inherently aware of the danger of mobilizing a bureaucratic staff for scientific administration, possibly due to their specialist academic background. Nehru complied with this and the space program developed without much bureaucratic control over scientific agencies, where Sarabhai and Bhabha had considerable autonomy, and focused on building independent research institutions. However, this should not suggest that the government gave up all its control but rather it was more focused upon oversight functions which reported directly to the Prime Minister. In 1961 the government put "Space Research" under the jurisdiction of the Department of Atomic Energy (DAE), which was created under the direct charge of Nehru through a Presidential Order. Around the same time, Dr. Sarabhai founded the Physical Research Laboratory in Ahmedabad which became the cradle of space science in India. In 1962 the Indian National Committee for Space Research (INCOSPAR) was established with Dr. Sarabhai as its Chairman which set up the Thumba Equatorial Rocket Launching Station (TERLS) with the help of Soviet Union, US and France, which launched the first sounding rocket in the following year (Lele, 2013).

Indian Space Research Organization (ISRO) was launched in

3 Non-aligned movement refers to those countries which chose not to officially align themselves with either of the two superpowers or any major power blocs where India played a pioneering role and became the first country to adopt it in 1961 when the Belgrade Conference officially established it.

1969 as the successor of INCOSPAR under the DAE, for formulating the policies and overseeing the implementation of the space program, thereby beginning the slow but steady institutionalization of the space program. In 1972 an independent Space Commission and Department of Space (DOS) were established, where the Commission was responsible for framing the policies which the DOS was responsible for execution through ISRO. Since then, through effective operation of these agencies, India has catapulted from experimentation to an operation era.

A significant feature of India's early space program was its exclusive commitment to civil development in the country unlike the space programs of superpowers which was equally, if not more, committed to military and national security needs. The direct benefits of a space program to the people may not be visible at first glance for a nation which was struggling to feed its people, however the pursuit of these benefits can be expressed in three rationales –"advancement of scientific and technical skills or capacity, inducement of economic growth, and improvement of standards of living" (Christensen et al., 2009:454). These assumptions were implied in Dr Sarabhai's proposal to the Indian government in 1961 suggesting a "small, but highly focused space program" oriented towards socio-economic development, to mitigate the real problems of the population, explicitly rejecting involving participation in a space race. To that end, an important initiative taken by him was SITE (Satellite Instructional Television Experiment) where he sought to reach the most difficult and least developed parts of the country through television relayed to these areas via geosynchronous satellites. As noted by Sankar (2007), the basic aim of India's (early) space program was to build a program capable of using space technologies in the vital areas of development such as communications, meteorology and natural resource management. Even as the space race intensified between USA and USSR, India maintained its commitment to the peaceful use of outer space and opposed its militarization which was not only due to its ideological commitment to non-alignment but also because it did not possess the relevant material capabilities for the same. Christensen et al. (2009) have identified international prestige and national security, apart from development, as major drivers of India's space program. It was Nehru's conviction that India was destined to play a major role in international politics and the space program would effectively prove this to the outside world, especially among the non-aligned group of countries. National security concerns were also an important part of Nehru's thinking which manifested itself in the form of the emphasis upon independence, which came from his experience of fighting colonial powers in the national independence struggle.

Nehru's vision of a scientifically and technologically advanced India was enhanced and sustained by his successors and India gradually expanded its wings in space experimentation. India launched its first rocket Rohini-75 in 1967, which although was a small sounding rocket with a diameter of only 29.5 inches, its successful launch demonstrated that India had mastered the fundamentals of modern rocket science. With the help of Soviets India launched on 19 April 1975 its first satellite, Aryabhata, on a Soviet rocket from a Soviet launch site. After that "The New York Times" reported: "After emerging last year as the fifth nation to be a nuclear power, India became today... the second developing country after China to orbit a satellite" (Weinraub, 1975). Five years later on 18 July 1980, India launched Rohini-1 to orbit using its own launching system, becoming the seventh nation in the world capable of launching objects into space by indigenously manufactured rockets (Mann, 2019).

Following its success with the Satellite Launch Vehicle (SLV's), ISRO began its design of the Polar Satellite Launch Vehicle (PSLV) which would take advantage of both old technology and new liquid engines and was touted to be the "workhorse" of India's space program. It made its maiden flight in 1993 which was a failure, but over the next few decades it charted an incredible trajectory for itself with 50 successful launches in the period between 1994-2019 and over the last 26 years has had five variants with its carrying capability increased to 1.9 tones from 850 kg (Simhan, 2019). In order to build a bigger, lighter and more efficient vehicle than the PSLV, ISRO explored cryogenic engines as an option. Despite some developments towards building it indigenously, ISRO cancelled the projects in anticipation of the Russian deal from Glavkosmos space agency which was signed in 1990 but the Russians backed out of the deal in 1993 and revoked the transfer of cryotechnology agreement. Under a renegotiated deal, Russia decided to provide four fully built engines and India began developing its own cryogenic engine and geostationary satellite launch vehicle (Mehta, 2014). These vehicles were required to launch the indigenously developed Indian Remote Sensing (IRS) satellite and a meteorology and telecommunications "Indian National Satellite" (INSAT). On 2 September 2007, India successfully launched its INSAT-4CR geostationary satellite with GSLV F04 vehicle. This launch proved India's capabilities to put satellites weighing around 2,500 kg into the geostationary orbit (Lele, 2013). The IRS satellite comprise the largest State-operated civilian constellation in the world and INSAT communication satellites operate in the entire Asia Pacific region, offering services including television broadcasting, weather forecast, disaster warning, search and rescue missions (Rajagopalan & Prasad, 2017). India launched EDUSAT in 2004, which was the first Indian satellite built exclusively for serving the educational sector. Over the years, India recorded significant achievements and invested heavily in satellite communication which was focused on societal application and developmental needs in line with Dr. Sarabhai's vision.

When India entered the race for acquiring space technology, exploration of the Moon or planets was a distant dream. India proved that it has come a long way since then with the successful launch of Chandrayaan 1, its first Moon mission, on 22 October 2008 which carried scientific instruments built by NASA (among others) and helped detect water in the Moon, proving that it has the capabilities for deep space scientific exploration (Rajagopalan & Prasad, 2017). Another proof of Indian ingenuity in the face of incredible odds was India's Mangalayaan mission which succeeded in first attempt to send an operational mission to Mars at 74 million USD on 5 November 2013 only two days after American Maven orbiter which cost almost 10 times more (Amos 2014).

Antrix, the marketing arm of ISRO, was established in 1992 with the objective of promoting and commercially exploiting the space products developed by ISRO which opened a previously unexplored commercial front of the space industry. The trend of globalization in space activities manifests itself in the form of an emerging space diplomacy where India is actively using space to pursue its diplomatic objectives. ISRO has undertaken various initiatives in providing expertise and services to developing countries in the applications of space technology. ISRO Telemetry, Tracking and Command Network (ISTRAC) operates three international stations in Brunei, Indonesia and Mauritius. The heads of ASEAN space agencies met with ISRO officials in 2012 seeking India's assistance in developing their own programs (Avuthu, 2014). India used space as a tool in its contemporary neighborhood diplomacy which was visible when in 2017 it launched the South Asia Satellite, a purely communication satellite costing more than 30 million USD, which India gave for use by neighbors at no cost (ET Online, 2017).

It is clear that from its rather modest origins, India's space program has come a long way from where it started with humble aspirations and is now seeking to launch its first human space mission called Gaganyaan (sky vehicle in Sanskrit) by 2022 and the government announced that it would be allocating 180.3 million USD, however the estimated budget is about 630 million USD (Howell, 2020).

DEVELOPMENT OF CHINA'S SPACE PROGRAMME

The development of the Chinese space programme can be divided into several stages and its beginning was marked by certain important events.

Initially, China started conquering the fourth dimension as early as the mid-1950s, when it began manufacturing ballistic missiles alongside the United States (US) and the Soviet Union (USSR). Although it benefited from its cooperation with the USSR to a certain extent, it developed its space programme largely on its own, as Whitman-Cobb (2019) points out. According to many (Thompson & Morris, 2001; Acuthan, 2006; Harvey, 2013), Tsien Hsue-shen was most responsible for establishing the Chinese space agenda who gained his knowledge in the field of aeronautical engineering in the United States where he studied and worked and who was deported to China in 1955, after an investigation for alleged ties to Communists (Bhola, 2009:13). A year later, Mao Tse-tung formally announced the launch of the Chinese space programme (Thompson & Morris, 2001:4) and appointed Tsien director of the newly formed China Rocket Research Institute (Harvey 2003:50), responsible for the development of missile technology, particularly for Long March Series (NASA, 2013).[4] Under Tsien's guidance, the space programme of the world's most populous nation underwent a gradual upgrade, and four years later (5 November 1960) China became the fifth nation in the world (alongside Germany, the US, the USSR and France) to launch its own rocket into cosmos (Thompson & Morris, 2001:iii). Shortly afterwards (19 July 1965), the Chinese also sent the first living creatures into space (several white mice), bringing them back successfully to Earth on a redesigned T-7 rocket (Mongia, 2013:239).

A significant success was made on 24 April 1970, when China launched its first satellite named Donfangong 1 using the Long March 1 rocket (Goswami, 2018:75; Mongia, 2013:239), marking a new phase in the development of the Chinese space programme. China thus became the fifth country in the world (along with the USSR, US, France and Japan) to have its satellite in orbit, with the success of the Long March programme encouraging Beijing to begin its plans to send the first human mission into space. However, due to the Cultural Revolution and Mao Tse-tung's death, those efforts were delayed, China's leadership adjusted its space exploration budget to slightly more modest ambitions.

That is to say, that in the ensuing period authorities in Beijing focused their attention on other priorities, primarily satellites and the

4 The Chinese Rocket Institute was established on 8 October 1956 (Mongia, 2013:239).

further development of missile systems. Most credited to this were politicians like Zhou Enlai, Lin Biao and the so-called Gang of Four, who harboured the belief that China's achievements in space would affect the growth of China's prestige in the international environment. Therefore, they sought to make the development of communications satellites a national plan, which was done in 1975, and in the same year, on 26 November, China launched its first recoverable satellite – Fanhui Shi Weixing (FSW-0 No.1) (Williams, 2019). In fact, according to the East Asian Strategic Review: "During the 1970s and 1980s China launched 31 more satellites after Dongfanghong 1 satellite, seven of which failed. The first few were tests, followed by the successful launch missions of remote sensing and communication satellites"_(EASR, 2008:20). In addition, by the late 1980s, China made a significant progress in developing the Long March programme, which, according to some authors, by 1985 allowed it to develop a commercial launch programme for foreign clients, predominantly from Europe and Asia, but also for others who were willing to pay for such a service (Mongia, 2013:245; Williams, 2019). Such developments led to the successful launch of the first communication satellite (Dongfanghong 2) into the geostationary orbit, and two years later (1986) space was accorded the highest priority status in the technological programme (Acuthan, 2006:1; EASR, 2008:20), marking a new phase in the development of the Chinese space agenda.

The decision made proved fruitful because the Challenger disaster and problems with Titan and Delta and with Europe's Ariane faced the Americans and Europeans with a lack of a secure satellite tranport system and forced them to rely on Russian and Chinese technology (Thompson & Morris, 2001:5). Mongia (2013:245) claims that after 1985 the Chinese launched more than 30 satellites for foreign clients, and encouraged by the successes in the field, they continued to develop the Long March programme, which was evidenced, among other things, by the production of a new rocket from the aforementioned series – Long March 4 – in the late 1980s (EASR, 2008:20). The encouragement they gained led to the adoption of the Astronautics Plan 863-2 by the Chinese government in March 1986, which called for the creation of a space plane (Project 863-204) to ferry astronaut crews to a space station (Project 863-205). Although the technical solutions within the proposed projects did not meet expectations, they were, in the opinion of some theorists, a basis for further research (Mongia, 2013:245; Williams, 2019).

In the following period, the authorities in China engaged in the reorganisation of the space activity management system. The result was the formation of the China National Space Administration (CNSA) in 1993, under whose leadership the launch of the first Shenzhou 1 spacecraft was completed on 2 November 1999 (EASR, 2008:21). Furthermore, after a few additional test flights, on 15 October 2003, the Chinese sent their first taikonaut (Taikonaut - Chinese astronaut), Yang Liwei, on the Shenzhou 5 spacecraft using one of the rockets from the Long March series (Mognia, 2013:246; Goswami, 2018:76), thus practically beginning the fourth phase of development of the Chinese space programme.

In the time that followed, Chinese space activities accelerated significantly. Namely, instigated by the success of the first mission with the human crew, the Chinese sent a total of seven taiconauts on the Shenzhou 6, 7 and 9 spacecrafts, with the first Chinese woman, Liu Yang taking part in the last mission undertaken (Mongia, 2013:246). Additionally, Beijing conducted its first anti-satellite missile test in 2007 (Konjikovac, 2012:34; Goswami, 2018:76), and a little later a pilot programme to install a temporary orbital station in several stages was initiated - Tiangong 1 was launched in 2011, and its successor, Tiangong 2, in 2016. As Williams (2019) explains, lessons learned from these undertakings should serve to install a third station – Tiangong 3.

It is important to emphasise that, during this phase, China also made rapid progress in deploying its own constellation of positioning, navigation, and timing (PNT) to deepen its strategic ties with countries on the Silk Road. According to Sun and Zhang, the aforementioned satellite system, named Beidou, should increase interconnectivity and interoperability among its users and serve as an impetus to open many markets such as West Asian, African and others. (Sun & Zhang, 2016:24). Some sources state that dozens of satellites already exist in the network (Harrison, 2019:3) and that, when fully operational, Beidou could be a serious rival to the US Global Positioning System (GPS) because it is expected to be more capable and accurate (Degang & Yuyou, 2016).

In addition, the development of the Chinese space agenda during this period is also characterised by initiation of lunar exploration. In 2003, the CNSA launched the so-called Chang'e programme (named after the Chinese goddess of the Moon), which envisioned sending a series of robotic missions to the Moon in preparation for an eventual crewed mission (Williams, 2019). As Williams (2019) explains, Chang'e 1 was launched in 2007, Chang'e 2 in 2010, and Chang'e 3 in 2013, with each mission tasked with gathering specific information to be used for the purpose of a planned colonisation of the Moon. According to Myers and Mo (2019), the biggest success in this regard is the Chang'e 4 mission initiated in 2018. Namely, apart from its task being to examine how lunar gravity affects living organisms, it is specific for examining the communication possibilities between Earth and the Moon on its ‘dark side’ for the first time in human history (Goswami, 2020). Following this success, which heralded the beginning of the latest phase in the development of China’s space programme and, according to some, the opening of an entire ‘new chapter in space exploration’ (Myers & Mou, 2019), Beijing outlined a number of plans for the future.

First of all, the CNSA announced new missions under the Chang’e programme (Chang’e 5, 6, 7, 8) that should serve to prepare the installation of a research base on the Moon by 2036 (Goswami, 2020), and, in addition, great attention will also be paid to the construction of a space station. According to Etherington (2019), all current stations (Tiangong 1, 2, 3) are intended as temporary orbital stations designed to test key technologies in pursuit of the “real” Chinese space station, which is set to begin its mission life in 2020 with the launch of the Tianhe-1 core module. If it succeeds in doing so, China may be the only country to have an active space station after the US government funding for the International Space Station (ISS) ends in 2024 (Bowe, 2019:2-3).[5] The news that The China Manned Space Agency (CMSA) has already selected scientists from 17 countries (out of 42 interested) who will participate in the experiments on the planned space station and the fact that representatives of the United Nations Office for Outer Space Affairs (UNOOSA) wholeheartedly supported this idea (Gibney, 2019) are convincing enough to prove how serious China is in its endeavours. As Williams (2019) points out, a large space station will consist of three modules: the Core Cabin Module (CCM), the Laboratory Cabin Module I (LCM-1) and the Laboratory Cabin Module II (LCM-2) - and will be supplied by the Shenzhou and the Tianzhou spacecrafts.

At the space symposium in Colorado Springs in April 2017, CNSA secretary General Yulong Tian stated that China has serious plans for exploring Mars, Venus, asteroids, and even Jupiter (David, 2017) and Uranus (Campbell, 2019), for which special models of missiles from the Long March programme were under preparation (McKie, 2020; Bowe, 2019:5-6). According to Jones (2020), in 2019 alone, the Chinese conducted 34 launches (with one unsuccessful), while in 2020 they plan to carry out more than 40.

In addition, China also plans to complete its Beidou navigation satellite system (Jones, 2020) and to build a space telescope with a field of view 300 times larger than the Hubble Space Telescope (Johnson-

5 According to some sources, there is still the possibility of extending the ISS life until 2030 (Foust, 2019).

Frese, 2018). But there is more to it. CASC issued a report recently claiming that China will possess fully reusable launch vehicles by 2035. Furthermore, the report also specified that China will achieve a major breakthrough by 2040 with regard to "nuclear-powered space shuttles", which will, according to some experts, enable mining of space-based resources, including from asteroids, and the establishment of solar power stations by 2050 (Goswami, 2018:76). After all, the statements issued by some Chinese officials unambiguously indicate that "China's goal is to be a major global space power by around 2030", and that "China aims to be a global leader in space equipment and technology by 2045" (Bowe, 2019:2). Successful completion of more than 100 orbital missions since the 1970s and realisation of a series of 50 consecutive launches without a single mistake in the period from 1996 to 2006 (Logan, 2007) sufficiently speak in favour of such claims.

SINO-INDIAN RELATIONS IN OUTER SPACE: TOWARDS CONFRONTATION OR COOPERATION?

Taking into account the development of India and China space programmes and their plans for the future, it seems that there is room for cooperation between the two nations as much as for competition.

On the one hand, it is clear to both countries that independent engagement, particularly when it comes to deep space exploration, has significant financial and technological limitations, and that conducting space activities is much easier if countries act jointly. In this respect, it is important to point out that in 2015 India and China formally established the so-called Sino-Indian Joint Committee on Space Cooperation, with the first meeting held in Beijing in the same year, on the occasion of which the basic guidelines and projects were outlined. As Patranobis (2019) states, referring to Chinese sources, the outline includes 19 projects in seven areas: remote sensing satellites, space-based meteorology, space science and lunar and deep space exploration, education and training, piggy-back launch services, satellite navigation, and space components. In addition, cooperation between China and India is also evident in the BRICS (Brazil, Russia, India, China, South Africa) architecture, where the two countries work together to develop satellites for different purposes (Lele, 2020). However, that is not all. After some scientific organisations in India recently expressed a desire for closer collaboration with their Chinese counterparts, Beijing responded by selecting two Indian agencies (the Indian Institute of Astrophysics and Indian Institute of Technology) to participate in experiments to be conducted at the new China Space Station (Lele, 2019). In a similar manner, immediately after India successfully launched Chandrayaan-2 in 2019, congratulations came from China along with a wish to enhance mutual cooperation, given that both sides are making significant progress in developing the space programme and have similar plans (PTI Beying, 2019). Chinese Foreign Ministry spokeswoman Hua Chunying said on the occasion: "The exploration of outer space including the Moon is the common cause of all human beings. They should contribute to the welfare of all people. China is committed to the peaceful use of outer space and we are actively engaged in international communication and cooperation on the issue. We would like to work with India for outer space exploration to deliver more benefits to mankind" (PTI Bejing, 2019).

On the other hand, while the importance of deepening cooperation and development of space as a zone of peace and prosperity is constantly emphasised in political communication, it is evident that there is still a certain degree of distrust among these countries when it comes to space activities. This is, among other things, confirmed by Hu Weija (2019), who, in principle, believes that India's approach to space exploration has had a positive impact on the expansion of collaboration so far. However, as the same author warns, if India's space ambitions go astray, it could spark an arms race between the two countries, which in his view, China will not welcome unprepared. Observing that with the progress of cosmic technologies, the ties between the two Asian countries have become extremely complex, Weija believes that India should provide some assurances that its space programme will not target anyone, noting that China should closely monitor every step of New Delhi out of precaution.

Such views may not come as a big surprise, since the two stakeholders have specific national interests that they pursue, with distinct differences in their space programmes in terms of scope and degree of development. This, after all, is very convincingly represented by the various projects of providing navigation and communication services to other countries, as well as the consequences arising from their implementation. Namely, while China is moving towards completing the installation of the global Beidou system that seeks to attract as many countries as possible into the Belt and Road Initiative (BRI) and its sphere of influence, India has launched its own regional project – South Asia Satellite – with the aim of retaining primacy, i.e., limiting China's influence in its neighborhood (Janardhan, 2018; Goswami, 2019). Moreover, as Janardhan explains: "With China helping South Asian countries launch satellites and expanding its Beidou Navigation Satellite System, India responded in kind. It ventured into China's zone of influence in East Asia by setting up a civilian and military satellite tracking and imaging centre in Vietnam in 2016 'to keep an eye' on China" (Janardhan, 2018: 6). Considering that in terms of capacity and capability, the entire Chinese space programme is much larger and more advanced than the Indian one (which has no global character and is more modest in nature, designed to meet specific national requirements), it can be said that India's behaviour is not without justification. As Ajey Lele, a senior fellow at the Institute for Defence Studies and Analyses in New Delhi, observes: "China has more capable satellite launch vehicles in comparison to India, and has a well-established human spaceflight programme in which their astronauts (taikonauts) undertake space-walks. They have also successfully tested the prototype for a proposed space station, which is expected to be operational in the near future and India is yet to make a beginning in this field. In the deep space arena, both India and China have successful Moon programmes, but India is yet to achieve a successful robotic landing (lander-rover system) on the Moon's surface" (Lele, 2020).

However, it is important to note that China does not lead in every aspect of space activities. To be more specific, in 2013 New Delhi succeeded in deploying a satellite to Mars on the first attempt – something that the Chinese did not do well and which is why they now keep a close eye on further developments in India (PTI Bejing, 2019). Additionally, over the years India has succeeded in gaining the reputation of launching smaller satellites in low earth orbit in a reliable and affordable manner.[6] It justified that image in 2017 when successfully launched as many as 104 satellites in just one mission, hinting to existing and potential customers that the launch price could be even more favourable. For Chinese officials, as Janardhan points out, this event was "a wake-up call", after which "they have stressed the need to 'reduce the cost of putting satellites in orbit' to expand Chinese market share and pushed 'to fast-track the commercialisation' of its satellite launches" (Janardhan, 2018:6).

Nonetheless, probably the biggest source of distrust between the two countries is the segment of space activities related to military capabilities in the cosmos, which is most notably reflected in the example of performing anti-satellite tests (ASAT). As Rajagopalan points out, this is a geopolitical chain reaction: "For instance, consider the US-China-India relationship. China often takes action because of its strategic competition with the United States. This has an impact on India, forcing India to respond. For example, China's first successful

6 As Janardhan (2018:4) points out, by the end of 2018, India sent a total of about 240 (mostly smaller) satellites to orbit for 30 different foreign clients.

ASAT in January 2007 was to demonstrate a catch-up effort with the United States. But once China tested its ASAT in 2007, India had little choice but to develop its own ASAT because of the need of deterrence" (Rajagopalan, 2019). This is, after all, confirmed by the statement issued by Director-General of the Indian Army's Perspective Planning, Lieutenant General PM Bali, who after the launch of Indian military space satellite the GSAT-7 in 2018 said: "There is a need for a dedicated military space programme with adequate resources at its disposal because of the changing realities in our neighbourhood" (Goswami, 2019). In other words, with the aim of demonstrating technological capabilities or providing security against potential threats caused by a variety of factors, a vicious cycle of mistrust is created, leading to the conclusion that a new space race or an arms race is under way.

CONCLUSION

Both India and China have developed significantly and stand as major economic, political powers on the global stage, driving the Asian century. Nevertheless, both continue to have unresolved, increasingly complex geostrategic issues which complicate the exisiting security dillema which governs their relationship. However, the ambitions of China and India correspond to a large extent, which opens up opportunities for cooperation that can be beneficial for both countries and at the same time provides a space for geopolitical competition if the two countries embark on a space or arms race. By all accounts, the answer to the question of whether China and India will move towards cooperation or confrontation in space will largely be determined by several important factors. It will primarily be influenced by the national strategic interests of these countries, on the basis of which some key foreign policy projects have been carried out and by further development of their space programmes in the forthcoming period as well.

In other words it is common knowledge that both countries, are developing their navigation systems and national lunar programmes and are constantly investing in space science, placing multiple satellite systems in orbit. Looking at the development of the situation from a commercial point of view, it seems that both countries also understand that there is a good market for various space technology products and they are keen to establish themselves as globally important players in the satellite launch market. Accordingly, as Lele explains, "they are utilizing space technologies to significantly drive socioeconomic development, using space as a medium not only for development and economics, but also to meet some of their own foreign policy objectives, like providing data or technology assistance to various smaller states" (Lele, 2020). In this regard, an important factor in the future of China-India relations in space will be the certainty of the success of (pan)regional projects – the BRI, on the one hand, and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation, on the other hand. In addition, the relations between the two countries will be affected by the dynamism within and between different organisations, such as the Asia-Pacific Space Cooperation Organisation (APSCO) led by China and the South Asian Association for Regional Cooperation (SAARC), led by India.[7] Of course, one of the major factors will be the behaviour of other great powers, particularly of the United States, but it will also be affected by the comprehensive geopolitical movements taking place on and around the planet.

So far, as some authors observe, there is enough potential for India-China cooperation in spheres apart from space. This means that although their relations are somewhat burdened by the issue of borders, the fact is that for over 40 years there have been no open conflicts between these countries, in addition, China is India's second largest trading partner (Lele, 2019). With this in mind, Lele (2019) believes that joint research on the fourth dimension could encourage new forms of cooperation and have the beneficial effect of reducing differences between the two nations, or at least causing cosmic activism to be excluded from the total geopolitical matrix present on Earth. The author refers to the US and Russia as an example, whose cooperation in space is constantly present despite many terrestrial challenges such as the issue of Crimea, the situation in Syria, etc.

Considering that China and India are large energy consumers, perhaps collaboration in exploration and exploitation of space resources could be a suitable platform to start more intensive cooperation between the two Asian powers. That such assessments are not baseless is evidenced by the fact that in November 2012 (during the visit of the then Indian President to Beijing), Chinese officials proposed that the two nations begin joint work to build a solar satellite that would serve the energy needs of both countries (Nair, 2014:7). As a matter of fact, according to Lele (2019), there have been repeated appeals on the part of Chinese side to intensify cooperation in this area as well as in the others. In Weija's view, if China and India seize the opportunity created by opening the fourth dimension, it could, in addition to

7 For example, when in 2014 the Indian president raised the issue of launching the so-called South Asian satellite which would serve the entire region of South Asia, Nepal, Afghanistan, Sri Lanka, Maldives, Bangladesh and Bhutan wholeheartedly accepted the offer, while Pakistan, which is typically aligned with China, refused to participate in the project (Goswami, 2019; Rajagopalan, 2019).

economic exchange and the development of cutting-edge technologies, also promote mutual trust. The author concludes that China and India currently face a "great challenge", but also a "great chance" if wisdom prevails (Weija, 2019). After all, both countries have launched their space programmes in the light of different motives that have changed over time, which does not exclude the possibility that they may be further transformed in the future to suit common interests.

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ВИСОКО НЕБО – НИСКЕ ТЕНЗИЈЕ: МОГУ ЛИ ИНДИЈА И КИНА ДА ПРОНАЂУ ЗАЈЕДНИЧКИ ИНТЕРЕС У СВЕМИРУ?

Резиме

Супарништво из Хладног рата пренето је и у свемир када су Совјети лансирали Спутњик 1957. године, што је довело до тога да свемир буде препознат као четврто подручје ратовања. Како се монопол Сједињених Држава и бившег Совјетског Савеза губио, настајао је простор за нове актере који се појављују у Азији, где су Кина и Индија, због својих улагања у свемирску технологију још педесетих година 20. века, имале значајну предност. Овај рад прати развој свемирских програма ове две азијске земље и утврђује како су ти програми прилагођени да испуне њихове тежње да постану глобалне свемирске силе. У контексту компетитивне сарадње која карактерише њихове свеукупне билатералне односе, рад процењује тенденције њихових националних свемирских програма у циљу предвиђања да ли ће се кинеско – индијски односи кретати ка сукобу или сарадњи. С обзиром на сличне амбиције обе државе у свемиру, у раду се закључује да постоји простор за сарадњу, као и за конкуренцију, а којим путем ће ове земље кренути у великој мери зависи од њихових националних интереса и даљег развоја њихових будућих пројеката.

Кључне речи: Индија, Кина, свемир, дипломатија, сарадња, конкуренција, технологија, Азија, геополитика

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