BUILDING CAPABILITIES FOR SECURING INDIA'S INTERESTS IN, FROM, AND TO SPACE

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For most part of the recent scientific evolutions, it has popularly been believed that space is a global heritage, with applications benefiting mankind in ways both social and economic. However, for many space powers of today, as they began their endeavours for space, so did they also begin their efforts for its military utilisation. National security has, thus, remained at the core of their space programmes. In the race to control space, aggressive posturing by the USA, China and Russia is clearly evident and is only likely to intensify hereon. But what do the new and emergent players perceive of space? Are they subtle beginners? Do they look forward to only scientific explorations, seeking mere social and economic benefits or are they poised to contest in space aggressively?

This article reviews the space security perspectives of the emergent space players and argues that though India has made considerable progress in peaceful utilisation of space, its space programme may need to be more assertive in the light of the growing contest in space.

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On October 31, 2023, Israel's Arrow-3 missile successfully intercepted the Houthi-launched Qader missile over the Red Sea, thus, registering, supposedly, the first ever combat[1] in outer space. An advanced version of the Iranian Shahab missile,[2] the Qader missile was aimed on objectives in Israel's southern city of Eilat.[3] Being a Medium Range Ballistic Missile (MRBM), the Qader should have been at altitudes over 100 km at the time of interception. These altitudes, by common definition, are in the 'space' domain. Despite having the availability of the Iron Dome, with ranges up to 40 km, and the David Sling Systems, with ranges up to 300 km, Israel chose to use the last layer of its air defence, the Arrow-3 missile, with the ability to intercept incoming missiles at ranges upto 2,500 km. While no official rebuttal is known to have been presented by Israel, an assertion that this was the first ever 'in-space interception during active combat' may not be an over-statement. Two days prior to the incident, in his interview to the London based daily newspaper *Daily Star*, Avi Berger, the head of Israel's Space and Satellite Administration, said that Israel is interested in 'space weapons' and expressed much interest towards building Israel's counter-space capabilities.[4] Much earlier, in February 2023, Boaz Levy, the Chief Executive Officer (CEO) of Israel Aerospace Industries had said that Israel has been working towards building space warfare capabilities.[5] In doing so, Israel is building a system of systems that integrates radars and satellites with complex air defence systems like the Barak and Arrow missiles that can interrupt incoming missiles in deep space out of the atmosphere.

1. Harriet Barber,"How Israel Shot Down a Ballistic Missile in Space for the First Time", *Telegraph*, November 5, 2023, www.telegraph.co.uk. Accessed on September 13, 2024.
2. Samantha Arias,"Has Israel Started First Space War in History With Arrow Defense System", *Sputniknews*, November 19, 2023, www.en.sputniknews.africa. Accessed on September 10, 2024.
3. Emanuel Fabian,"Missile from Yemen Intercepted over Red Sea as Houthi Chief Vows to Keep Up Attacks", *Times of Israel*, November 14, 2023, www.timesofisrael.com. Accessed on September 21 2024.
4. Adam Cailler, "Space War Fears Grow as Israel Official Admits 'We Are Interested in Space Weapons'", *Daily Star*, October 27, 2023, www.dailystar.co.uk. Accessed on September 1, 2024.
5. Yoav Limor, "Israel on Working on Space Warfare Capabilities", *Israel Hayom*, November 22, 2023, www.israelhayom.com, Accessed on September 14, 2024.

Emergent players such as Israel view space capability development not only in terms of utilisation of space but also in terms of its denial to the adversary. Such new players are beginning to view space from the perspective of security and are orienting their strategies accordingly.

EVOLVING NATURE OF SPACE DOMAIN

The USA's National Security Space Strategy recognises the nature of the space domain as being increasingly congested, contested and competitive. Capabilities which enable access to space, its sustained usage and its denial to the adversary, therefore, are being identified as essential ingredients of a successful and comprehensive space programme.

While a large number of capabilities are being developed by nations across the world to enhance their prominence in space, the notable trends include Space Situational Awareness (SSA) and counter-space capabilities. Further, creation of a credible Space Force exclusively earmarked for space operations demonstrates the resolve of these nations towards space security. Such deterrent capabilities limit or prevent belligerent attacks on assets that enable space-based operations[6] and are expected to facilitate the security of space assets.

SPACE SITUATIONAL AWARENESS

Space Situational Awareness (SSA) can be understood as the requisite knowledge of events or activities in space. These may include human activities such as the satellite launches of other countries, their orbit parameters, suspicious in-orbit manoeuvres, robotic operations, etc. They also include natural events such as the movement of asteroids, and presence of solar winds, which may have implications on the functioning of own satellite operations. In order to build this knowledge, countries are required to build a network of telescopes and radars which may be based on the ground or in space. These telescopes and radars continuously observe all events and activities in space in order to develop a real-time picture. These telescopes and

6. Stephen Flangan, et. al., "A Framework of Deterrence in Space Operations", *RAND*, August 31, 2023, www.rand.org/t/RRA820-I. Accessed on March 16, 2024.

radars need to be positioned across the globe and further need to be connected by means of a global network.

Owing to heavy budgetary implications, only a few countries such as the USA, USSR and China have made advancements in the SSA domain.[7] The USA is the global leader in SSA, operating niche ground-based facilities like the Space Fence, Ground-Based Electro-Optical Deep Space Surveillance (GEODESS), Falcon Telescope Network (FTN) and even space-based systems to include Space-Based Infra-Red Systems (SBIRS), Space-Based Space Surveillance (SBSS) and Geosynchronous Space Situational Awareness Programme (GSSAP). China is also expected to have a network of phased array radars for tracking objects in Low Earth Orbit (LEO) upto 3,000 km altitude at Jiangxi, Hainan, Xuanhua (Heibei province), Changchun, Henan, Kunming and Kashi.

Militarily speaking, continuity of service during critical times of war is of central importance and, therefore, satellites providing essential services to the military need to be provided SSA cover. Military SSA would be focussed on the adversary's suspicious satellite launches, orbit manoeuvres, new experiments, space robotic activities, orbit ascent and descent, utilisation of suspicious dormant satellites, launch of Anti-Satellite (ASAT) weapons and Directed Energy Weapons (DEWs). Enhancements in SSA capabilities may even enable the military to employ close watch satellites for observation of the adversary's satellite designs, payload types, their structure and possible employments.

COUNTER-SPACE PROGRAMME

The ability of space assets to provide unrestricted global presence and access makes them elements of key advantage in modern warfare. However, this very advantage makes them vulnerable to a variety of attacks as their orbital trajectories are predictable, thus, presenting them as easy targets. In the contemporary times, when space is increasingly contested and congested, a counter-space programme which entails building competencies for continued access to space

7. Gene H Mcall and John H Darrah, "Space Situational Awareness Difficult, Expensive and Necessary", *Air & Space Power Journal*, 26, no 4, November–December 2014, pp. 6-16, https://apps.dtic.mil/sti/pdfs/ADA625656.pdf. Accessed on March 16, 2024.

and its denial to the adversary, remains fundamental to a successful space programme. Some of the essential components of a counter space programme are listed in the subsequent paragraphs.

Kinetic Anti-Satellite (ASAT) Weapons: Among the known threats, kinetic ASAT weapons possess the most potent destructive capability. Kinetic ASAT weapons include direct ascent ASAT missiles and orbital ASAT satellites. A direct ascent ASAT missile is launched from a terrestrial missile base, while co-orbital ASAT satellites can be manoeuvred in orbit to strike an adversary's satellites. The USA is likely to have two operational missile defence systems that also have latent ASAT capabilities; the Ground-Based Interceptor (GBI), part of the Ground-based Midcourse System (GMD) and the Ship-based Standard Missile-3 (SM-3) interceptor, part of the Aegis system.

Electronic Warfare (EW) and Cyber Attacks: A kinetic attack on satellites using ASAT weapons is direct, highly visible and difficult to deny. Further, it creates a large amount of debris that may draw global reactions. This has led to the consideration of using non-destructive and covert methods, including electronic warfare and cyber attacks which neutralise a satellite's electronics or communication to render it non-operable. On February 23, 2022, one day prior to Russia's invasion on Ukraine, in one of the most remarkable cyber attacks of modern times, Russia brought the internet services across Ukraine to a standstill by targeting the US-based firm Viasat's KASAT in cyberspace. Such was the difficulty in attribution and deniability that it took about 75 days for countries across the world to officially identify the originator of the offensive.

Dazzling/Blinding of Satellite Sensors: Directed Energy Weapon (DEW) systems project energy at the speed of light, and do not affect the space environment in their vicinity. They possess a soft kill capability to blind sensors and other electronic systems of the satellite well beyond the range of hard kill weapon systems. In 2006, China used a ground-based high-powered laser to temporarily blind the American 'Keyhole' spy satellite. DEWs include lasers, High-Powered Microwaves (HPM) and Electromagnetic Pulse (EMP) that cause damage to satellites without making physical contact.

Rendezvous Proximity Operations (RPOs): One of the common formats of counter-space operations are the RPOs. There have been

a number of instances wherein satellites operated by countries are deliberately manoeuvred in close proximity to target the satellites of adversaries. In-orbit collisions remain the primary threat to the RPOs. Such missions can also be utilised for close inspections of the targeted satellite. China has conducted multiple tests of technologies for close approach and rendezvous in both Low Earth Orbit (LEO) and Geosynchronous Earth Orbit (GEO) that have the potential to be utilised in the ASAT role.[8]

SPACE FORCE: A FLAGRANT RISE

China announced the raising of the People's Liberation Army Strategic Support Force (PLASSF) in 2015, earmarking an exclusive force for space, information and network operations. With an envisaged role in providing security to China's interests in space, the PLASSF can be said to a global trendsetter. In August 2015, the Russian Air Force was merged with the Russian Aerospace Defence Force, to be renamed as the Russian Aerospace Force. Soon enough, in 2019, the USA established its own Space Force, creating a new branch of the armed forces. With a stated mission to secure the USA's interests in, from, and to space, the Space Force aims to provide space superiority to the USA for all its space operations.[9] The "Comprehensive Strategy for the Space Force", released in August 2023 by the US Air Force, mandates the US Space Force to be ready and combat credible.[10] In 2019, France announced its own Space Command and in 2020, it renamed its air force as the French Air and Space Force.[11] There are, thus, visible security-concerns in the contemplations of space-faring nations and the same are reflected in their recent manoeuvres.

8. S.Chandrashekar, *India's National Security Annual Review*, *2016-17* (New Delhi: Routledge Taylor & Francis Group, 2018), pp. 381-392.
9. United States Space Force, "About the Space Force", www.spaceforce.mil. Accessed on December 20, 2023.
10. Department of the Air Force, "Comprehensive Strategy for the Space Force", August 15, 2023, www.spaceforce.mil. Accessed on December 20, 2023.
11. Vivienne Machi, "France Puts Space at Top of National and European Security Priorities", *Defense News*, March 14, 2022, www.defensenews.com. Accessed on December 20, 2023.

ESTABLISHED MILITARY-SPACE PLAYERS: USA, RUSSIA AND CHINA

At the global level, militarisation of space is, at the least, a reality, with leading space-faring nations undertaking demonstrative military actions in the space domain . With over 150 military satellites, the USA has emerged as the flag-bearer in the race to space. In 2019, the USA-led North Atlantic Treaty Organisation (NATO), announced space as the fifth domain of operations, in addition to the existing land, air, sea and cyberspace domains. Cooperative security, collective defence and crisis management have been identified as the core tasks by the alliance.[12]

There are, however, no clear victors, as the domain is being increasingly contested by Russia and China. A report published by the Secure World Foundation claimed that Russia may have developed significant counter-space capabilities to include LEO co-orbital ASAT, EW, direct ascent and DEWs.[13] China has also fast paced its military space capabilities in the recent years. In 2000, the Chinese Space Technology Research Academy embarked on an ASAT programme including lasers, micro–satellites, Electromagnetic (EM) weapon system and a ground-based missile system to destroy satellites in space. By 2006, China had carried out its first test of soft kill measures wherein a US spy satellite was targeted by a high-power beam. China is likely to possess the KT-2, Dong-Neng (DN)-1 and DN-3/SC-19 missiles for direct ascent ASAT purposes. China's SC-19 ASAT test of 2007 demonstrated its military resolve for space security. It performed the test in LEO and is likely to be furthering these capabilities for GEO and may also repurpose its RPO capabilities into co-orbital ASAT capability. In July 2013, China's SY-7 initially flew close to the SJ-15,after which it changed orbit and came closer to the CX-3. The SY-7 is also known to have carried a robotic arm which the Chinese claimed was for scientific experimentations. The three major players viz the USA, Russia and China have remained

12. Betty Wehtje, "Increased Militarisation of Space: A New Realm of Security", *Beyond the Horizon*, June 6, 2023, www.behorizon.org. Accessed on November 27, 2023.
13. Brian Weeden and Victoria Samson, "Global Counterspace Capabilities", Secure World Foundation, April 2020, www.swfound.org. Accessed on November 11, 2024.

steadfast in militarisation of space and, more so, in maturing their counter-space programmes.

EMERGING SPACE PLAYERS

Dominant players in space such as the USA, USSR and China have already been treading the path of militarisation of space for a considerable part of space history. While the initial endeavours were undertaken in moderation, the recent forays by these nations in space have remained rather demonstrative and blatant. On the other hand, are players such as India, France and the European Union (EU) which have continued to accord primacy to civilian utilisation of space. These players have made considerable progress in civilian space applications, but their military space endeavours are still evolving. Then there are nations which are comparatively newer players in space such as Israel, Iran, Türkiye, Australia and the United Arab Emirates (UAE). While the USA, USSR and China have strategic orientations assigning primacy to space security, a study of the newer players can help us draw conclusions on the evolving nature of global space users. Do these new players have a completely civilian perspective of space? Is the character of global space endeavours more security oriented? In terms of the number of its satellites and global space usage, India is expected to be the fourth largest user of space. Despite this, is there much to learn from the newer players in space regarding the manner in which they assign primacy to space security?

Israel

Israel's early efforts began in the 1960s with university level research. In 1963, the Israel Academy of Social Science established the National Committee for Space Research, and, in 1983, the Israel Space Agency was formed. Israel's security-related space activities were led by the Ministry of Defence (MoD) while those for civilian applications were led by the Israel Space Agency. Soon enough, in 1988, Israel launched the OFEQ-1, its first space observation satellite. In order to gain a competitive edge, key private partners, including Israel Aerospace Industries, El Op and Rafael were also contracted, to weave them closely into space ventures. Over the years, Israel has been able to launch satellites, including the Eros A, OFEQ 5, Eros

B, OFEQ 7. Its TecSAR satellite, launched in 2007 was amongst the first in the world to be able to penetrate clouds and observe by night. It has also launched an array of communication satellites to include the Amos-1 (which has outlived its life), Amos-2, Amos-3, Amos-4 and Amos-5. Today, Israel has developed key space capabilities in the field of miniaturisation, remote sensing and light weight satellite development. Its Shavit series of launchers can place satellites in GEO.

Having realised the significance of space security, Israel created a Space Task Force in 2009, with an objective to maintain its strategically leading position and increase public-private partnerships in the space domain. Based on the recommendations of the Space Task Force, the National Civil Space Policy 2012 was formulated. Israel's ballistic missile defence, being one of the most advanced and comprehensive in the world, incorporates key space capabilities, including detection, early warning and interception. Some of its niche endeavours include the Space Autonomous Mission for Swarming and Geolocation with Nanosatellites (SAMSON). Recently, Israel and the UAE came together for the signing of the Abraham Accords with an objective of collaboration in the military space domain.[14]

Australia

In January 2022, Australian Defence Minister Peter Dutton declared the raising of the Defence Space Command for Australia, thus, recognising space as a military domain. He noted that the increased possibility of utilisation of hypersonic missiles, grey zone actions and possibilities of targeting of satellites necessitated the raising of the Space Command.[15] In 2022, Australia laid down its Defence Space Strategy with five-pronged objectives for its space security. Of these, the second objective aims to integrate the whole of government efforts, and the capabilities of its allies and partners towards bringing military effects. For achieving this objective, Australia aims to build national understanding about space security, develop the

14. Todd Harrison, Kaitlyn Harrison, et. al., "Space Threat Assessment 2022", Centre for Strategic and International Studies, April 4, 2022, www.csis-website-prod.s3.amazonaws.com. Accessed on November 11, 2024.
15. Stephen Fallon, "The Ongoing Militarisation of Space", Parliament of Australia, www.aph.gov.au, June 22, 2022. Accessed on November 12, 2024.

government's inter-departmental coordination and cooperation, establish a policy guidance on space control, and establish robust cooperation arrangements with international partners.[16]

Iran

Iran uses its space programme to demonstrate its national strength and prowess. Iran has a civilian space branch, the Iranian Space Agency (ISA) and a military branch, the Islamic Revolutionary Guard Corps (IRGC) Aerospace Force. Created in 2009 from the IRGC Air Force, the IRGC Aerospace Force has the ability to build its own launchpads and satellites. Iran aims to routinely launch satellites in space by 2026 and even send an astronaut to space by 2032. The IRGC Aerospace Force was independently able to launch the Noor-1 military satellite in 2020.

Japan

Post the passing of the 2008 Basic Space Law, Japan's policy of prohibition on space militarisation is no longer applicable. Being a late starter in the domain, Japan has established its first military squadron for space as part of its Japan Air Self-Defence Force (JASDF) which is expected to launch its first monitoring satellite in space by 2026. Japan also plans to raise a second space unit which would be aimed to protect Japan's satellite from electromagnetic attacks. Its US-built SM-3 can act as a potential ASAT weapon and its Aegis weapon system has been integrated with an enhanced radar system by the US' Lockheed Martin, thus, building an ability to detect and track ballistic missiles and, subsequently, guide intercepting missiles.

UAE

The UAE established the Mohammed Bin Rashid Space Centre (MBRSC) in 2006 and soon enough it launched its first earth observation satellite in 2009. The UAE established its Space Agency in 2014 and announced its National Space Policy in 2016. Soon enough, it announced the launch of the Hope Probe mission to Mars in 2021. The UAE also plans to launch spacecraft to study the asteroid

16. George Henekke,, "The State of Australian Defence Space Strategy",*The Strategist*, January 17, 2024, https://www.aspistrategist.org.au. Accessed on September 12, 2024.

belt between Mars and Jupiter by 2028.[17] With a vision for the future, in 2019, the UAE released its National Space Strategy, 2030.[18] This strategy identifies seven global directions in the space sector of which security in space has been identified as a guiding tenet for its space programme.[19]

Türkiye

Türkiye founded its own space agency in 2018. As Türkiye launched its military communication satellite Turksat 5B in 2021, its ambitious President Recep Tayyip Erdogan said that the space programme was aimed to defend Türkiye's rights in space. Türkiye had already launched the Turksat 3A, 4A and 4B earlier. With the help of SpaceX, the Turksat 5A and 5B military communication satellites were also launched recently.[20] In September 2022, Türkiye signed an agreement with the private space player Axiom Space to send Turkish astronauts to space. Axiom Space is currently working on a commercial space station which is expected to be the first in its category.[21]

It can be said that emerging space players envision the application of space for both military and civil purposes. Further, they are formalising this vision by means of well stated policy and strategy documents. Most remarkably, these are not refraining from raising their own space cadres, branches, agencies or even space forces to concentrate all their efforts in ensuring space security themselves.

SECURING INDIA'S RIGHTS TO SPACE

India's national space objectives, as listed on the Indian Space Research Organisation's (ISRO)'s website, present a peaceful and civil-centric

17. Murdo Morrison,"How UAE is Making the Case for Space", *Flight Global*, November 13, 2023, www.Flightglobal.com. Accessed on September 13, 2024.
18. Kayan Unwalla, "Global Outer Space Guide: United Arab Emirates", *Norton Rose Fulbright*, September 2023, www.nortonrosefulbright.com. Accessed on September 12, 2024.
19. UAE Space Agency,"National Space Strategy (Summary) 2030", December 31, 2019, www.space.gov.ae. Accessed on September 13, 2024.
20. IANS, "Türkiye Plans to have 10 Satellites in Space by 2023", *Economic Times Telecom. Com*, June 15, 2022, www.telecom.economictimes.indiatimes.com. Accessed on September 24, 2024.
21. Axiom Space,"Axiom Space and Türkiye Sign Agreement to Send First Turkish Astronaut to Space", *PR Newswire*, September 19, 2022, www.prnewswire.com. Accessed on September 11, 2024.

intent. While India is amongst the major space-faring nations in the world, its space programme has majorly and consciously focussed on societal applications and economic development ever since its inception.[22] The needs of national security apparently have played a primary role during the conception and design stages of India's space programme.

The founding father of India's space programme, Dr Vikram Sarabhai had said:

> We do not have the fantasy of competing with the economically advanced nations. But we are convinced that if we are to play a meaningful role nationally, we must be second to none in the application of advanced technologies to the real problems of man and society.

The Indian space programme is, thus, fundamentally designed to meet the civilian requirements of communication, data and telecommunication network, education, remote sensing and weather forecasting. It was only recently, in 2023 that India's National Space Policy incorporated the "nation's security"[23] as one of the elements of India's vision for space.

As far as the military utilisation of space is concerned, militaries across the world utilise space chiefly for Satellite Communication (SATCOM), surveillance from space and satellite-based navigation. While India has made reasonable progress in these domains, capabilities which help secure India's continued access to space and further enable it to deny it to others may need equal impetus.

Building SSA Capabilities: The success of ASAT operations depends on the availability of knowledge of the adversary's satellite data to include its trajectory parameters. Acquiring such data entails building sound SSA capability. India, therefore, may have to work towards building a SSA sensor network at the national level. SSA also contributes towards detection of the adversary's launch of ASAT

22. V. Anand, *China's Space Capabilities,* New Delhi Paper 2, CAPS (New Delhi: Knowledge World, 2012), p. 47.
23. ISRO, Government of India,"Indian Space Policy-2023", www.isro.gov.in. Accessed on September 1, 2024.

weapons. Such capabilities also strengthen own Ballistic Missile Defence (BMD) capabilities. A cluster-based Signal Intelligence (SIGINT) for detecting missile telemetry, air traffic and the adversary's radars for Air Defence (AD) should also be incorporated within the SSA. Further, satellites with the Automatic Identification System (AIS) undertaking maritime surveillance should augment the SSA network. Strategic partnerships and military level exchanges also need to be built in towards developing own SSA.

Maturing Counter-Space Capabilities: India undertook Project Shakti on March 27, 2019. A direct ascent ASAT weapon is a kinetic method of engagement, resulting in the destruction of a satellite. It is usually detectable, attributable and not easily deniable. However, in the light of the global outcry on the increasing debris in space and given the increased number of satellites in space, kinetic kill measures alone may not be the most suited deterrence measures. Credible counter-space capabilities need to be diverse, non-detectable and, preferably, deniable. Necessary competencies, therefore, need to be built in DEW, EW and cyber offensive capabilities. In-orbit manoeuvring and robotic applications also need to be furthered towards building latent capabilities.

Building a Space Force: ISRO playing a single point exit for all space efforts may not be the best case scenario from the security perspective. Accordingly, in 2019, India announced the institution of the Defence Space Agency together with the Defence Space Research Agency (DSRA). On December 11, 2023, *The Times of India* published a report wherein it was believed that the Indian Air Force (IAF) may have moved a proposal for renaming itself as the Indian Air and Space Force. A move such as this would can help consolidate all space security aspects under a singular agency, thus, boosting our endeavours to preserve our rights to use space.

Building Satellite Defence: India needs to create redundancies in space assets in order to ensure continued operations even when targeted. This can be achieved by the creation of a networked constellations of satellites with a distributed architecture so that the system continues to function even after the destruction of one or more satellites in the constellation. Further, a reserve of satellites can also be created in space which can be activated at a time of choosing. A

multi-tiered constellation of micro-satellites would be less vulnerable to enemy attack and will provide significant redundancy. The manoeuvrability of our space assets and ground assets needs to be improved for evasive manoeuvres once a threat has been positively identified. One of the most vulnerable elements of a space system is its command and control link. India must develop and acquire military systems which are capable of withstanding or minimising the effect of adversary EW attacks for both satellites and ground segments. In addition, for satellite-based communication systems, India should develop indigenous jamming resistant systems. There is also a need to incorporate electronic counter-measures like enhanced encryption of up and down links, agile frequency hopping and signal -power boosting in communication systems.

CONCLUSION

National security has remained the central force behind the space programmes of some the dominant space players in the current day global order. Militarisation of space, thus, has remained a norm with the major space-faring nations such as the USA, Russia and China. On the other hand, are the emerging space players like Israel, Türkiye, Australia, UAE and Iran. Though their space programmes are in early stages, these countries have apparently set a strategic eye on space and are possibly poising their space programmes accordingly. On the contrary, security as a defining tenet, was apparently not an essential component in India's case for a considerable period of time. The recent incorporation of the same in India's Space Policy of 2023 is a remarkable and much awaited change, and needs to be further built upon. Key competencies such as SSA and counter-space capabilities need to be speedily developed to reserve India's rights to continued access to space. India may also consider delineating a separate force executing space operations focussed on space security.