LEVERAGING OUTER SPACE FOR NATIONAL SECURITY

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The world of diplomacy was much like the world of business, in which respect for sanctity of contract does not prevent the most startling reverses of fortune. Many diplomats were ambitious, some vain or stupid, but they had something like a common aim - to preserve the peace of Europe without endangering the interest or security of their country....

– A.J.P Taylor's magisterial survey of "The Struggle for Mastery in Europe."

The theme of the national seminar "Leveraging Outer Space for National Security" is an acknowledgement that in order to ensure national security to its fullest measure, it is critical to understand, harness, secure and control the fourth dimension: outer space. India has a well developed and mature space programme and the proposal to leverage outer space for national security has not come a day too soon. In order to achieve such a national security policy, it is imperative to understand *outer space* in the context of the rights and obligations of state parties under the international space law conventions and in the context of the current index of *global space security*. Such a background will be of assistance in identifying those aspects of outer space that can, and should, be leveraged to enhance national security. It will assist also to prioritise that into *long* and *immediate terms*, the identified goals. It needs no reiteration that India

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will necessarily achieve its goal of leveraging outer space for national security without seeming to deviate from the UN Charter, the space law conventions and steadfast adherence to the principle of the use of outer space for peaceful purposes.

It is given, of course, that only realistic goals and timelines will ensure success. The *long-term goals*, among others, would be: (i) to ensure uninterrupted and continued access to outer space; (ii) to control our space assets; (iii) to defend India's terrestrial and space assets from attack by terrestrial or space enabled weapons; and (iv) to be capable of managing effectively the fallout of such an attack. The *immediate goals* must be: (i) to revisit all current policies and guidelines pertaining to space-related activities that are the cause of ongoing security concern; (ii) to deconstruct identified policies/ guidelines to allow for an analysis of their effect on security; (iii) to establish how these should be amended to address India's present and future national security infrastructure needs; (iv) to identify such other collateral policies and systems(administrative, legal, technical, among other) which may need to be amended; and (v) to carry out the identified changes within the established timeline to achieve the imperative national security infrastructure needs.

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GLOBAL TRENDS IN SPACE SECURITY

The technology driven space age led inevitably to a race between the two super-powers to gain military superiority in outer space. However, although all space-faring states emphasise the importance of cooperation and the peaceful uses of space, including the promotion of national commercial, scientific, and technological progress, the fact is that trends in the recent years indicate that a growing number of states, led by the US, China, Russia, Japan, Israel, India and the European Union (EU) are placing greater emphasis on national security space applications. Furthermore, a large number of states are increasingly focussing on the security uses of outer space within national military doctrines.

The 2006 US National Space Policy[1] declares freedom of action in space as being equally important to the US as air power and sea power and includes the policy to deny access to space to perceived adversaries. Furthermore, the exercise by the US of the doctrine of *preemption*[2] has impacted the way in which countries are viewing their own security needs[3]. Consequent to their dependence on space

1. The 2006 US National Space Policy: www.ostp/gov
   The conduct of US space programmes and activities shall be a top priority, guided by the following principles:
   - The United States is committed to the exploration and use of outer space by all nations for peaceful purposes, and for the benefit of all humanity. Consistent with this principle, "peaceful purposes" allow U S defense and intelligence-related activities in pursuit of national interests;
   - The United States rejects any claims to sovereignty by any nation over outer space or celestial bodies, or any portion thereof, and rejects any limitations on the fundamental right of the United States to operate in and acquire data from space;
   - The United States will seek to cooperate with other nations in the peaceful use of outer space to extend the benefits of space, enhance space exploration, and to protect and promote freedom around the world;
   - The United States considers space systems to have the rights of passage through and operations in space without interference. Consistent with this principle, the United States will view purposeful interference with its space systems as an infringement on its rights;
   - The United States considers space capabilities — including the ground and space segments and supporting links — vital to its national interests. Consistent with this policy, the United States will: preserve its rights, capabilities, and freedom of action in space; dissuade or deter others from either impeding those rights or developing capabilities intended to do so; take those actions necessary to protect its space capabilities; respond to interference; and deny, if necessary, adversaries the use of space capabilities hostile to US national interests;
   - The United States will oppose the development of new legal regimes or other restrictions that seek to prohibit or limit US access to or use of space. Proposed arms control agreements or restrictions must not impair the rights of the United States to conduct research, development, testing, and operations or other activities in space for US national interests; and
   - The United States is committed to encouraging and facilitating a growing and entrepreneurial US commercial space sector. Toward that end, the United States Government will use US commercial space capabilities to the maximum practical extent, consistent with national security.

   United States Space Policy Goals
   The fundamental goals of this policy are to:
   - Strengthen the nation's space leadership and ensure that space capabilities are available in time to further US national security, homeland security, and foreign policy objectives;
   - Enable unhindered US operations in and through space to defend our interests there;
   - Implement and sustain an innovative human and robotic exploration program with the objective of extending human presence across the solar system;
   - Increase the benefits of civil exploration, scientific discovery, and environmental activities;
   - Enable a dynamic, globally competitive domestic commercial space sector in order to promote innovation, strengthen US leadership, and protect national, homeland, and economic security;
   - Enable a robust science and technology base supporting national security, homeland security, and civil space activities; and
   - Encourage international cooperation with foreign nations and/or consortia on space activities that are of mutual benefit and that further the peaceful exploration and use of space, as well as to advance national security, homeland security, and foreign policy objectives.
2. The doctrine of preemption is the foundation of the ongoing US war against Iraq.
3. David Lange "Beijing Mystery: Who Runs Military?" *International Herald Tribune*, article dated June 25, 2007. He writes in reference to China's foreign policy goal in respect to Taiwan: "But China's current thinking about when force is justified or what perceived threats are driving its accumulation of firepower remains unclear for most foreign governments and analysts. Some military analysts believe that there is now considerable debate underway in the Chinese military about the role of pre-emptive forces in some circumstances including the use of nuclear weapons."

assets, every country views an *uninterrupted access to space* and the *control of its space assets* as cardinal goalposts of its national security policy[4].

In 2006, there was a continuation of the increased focus on the security uses of space by a growing number of actors. These developments could have both positive and negative effects on space security. Whereas the security benefits of sustainable access to, and use of, outer space can have a positive benefit on space security, doctrines intended to serve national interests by developing negation capabilities may eventually threaten that security.

Equally, the increased emphasis on national security aspects of space has combined criticism of the 2006 US National Space Policy and, to a lesser extent, of the 2006 Chinese White Paper on Space Activities[5], underlining growing international tension concerning national uses of space. However, in general, states continued to promote international cooperation on the peaceful uses of outer space in new policies released in 2006. In so far as cooperation promotes transparency and confidence-building among space-faring states, this trend continues to exert a positive influence on space security[6].

That being said, the norms and practices of international society mandate enlightened, rather than narrow, self-interest. They call upon states to abstain from forcible intervention in the affairs of other states, to obey international law, particularly the principle of *pacta sunt servanda*, and to cooperate with others whereever possible, which in the post-1945 world involves commitment to global institutions like the United Nations. This is of particular relevance in the context of outer space, its exploration and its use. That is because the concept of 'sovereignty' over 'territorial acquisition' which lies at the heart of traditional international law, in both its customary and conventional applications, has been categorically and consciously eschewed in the context of outer space.

International space law had its genesis in the overriding desire of the two space powers to prevent the other from laying 'claim' or 'appropriating' or 'putting to

4. www.spacesecurity.org/BNLawsPoliciesandDoctrines.pdf, accessed on June 25, 2007
5. "China's Space Activities in 2006," *People's Daily Online*, October 12, 2006, online: *People's Daily* <http://english.people.com.cn/200610/12/eng20061012_311157.html> (date accessed: 25th June 25, 2007)).
6. Space Security Index www.spacesecurity.org accessed June 24, 2007.

military use' any part of outer space. The process for preventing the application of the principle of *'sovereignty'* to outer space, and the emphasis on its exploration and use only for *'peaceful purposes'* was spearheaded by the USA immediately after the launch of the Sputnik in 1957. The USSR had scored a resounding first over the US[7]. That single event changed the geo-political dimensions of the world inexorably. Consequently, space law is based entirely on international treaties and conventions, founded on general principles of international law, framed under the aegis of the UN.

International space law had its genesis in the overriding desire of the two space powers to prevent the other from laying 'claim' or 'appropriating' or 'putting to military use' any part of outer space.

There are two reasons why the challenge of outer space became critical to both the USSR and USA. First, the deployment on earth of intercontinental ballistic missiles (ICBMs) carrying deadly nuclear warheads which could reach their terrestrial target within 24 minutes, by following a trajectory through outer space, over the North Pole. Second, because the presence of that nuclear threat necessitated placing satellites in space to give surveillance coverage as well as strategic and tactical warning. The 1967 Outer Space Treaty (OST 1967), thus, reflects the imperatives of the superpowers. It was the outcome of diplomatic wrangling, negotiations and compromises. In other words, it was the product of 'consensus' achieved by international diplomacy at the UN, "to preserve peace without endangering the interest and security of their country."

Given that at the time the two spacepowers were not expecting any competition in space in the foreseeable future, it is not surprising that the US and USSR readily accepted the principles enshrined in the OST. The focus was firmly on the orbit seen in its 'military' dimension. From the US point of view, the OST put an effective

7. The US had itself decided to build a rocket for launching during the International Geophysical Year. The attempt to launch the Vanguard test satellite ended in failure, although this three-stage launcher provided experience in the use of solid-propellant engines as stages for later space vehicles. However, stung by Russian success in 1957, the USA put its mind to rapid development of space technology and scored its first on July 27, 1969, by putting a man on the moon. Meanwhile, the USSR seemed to have lost its advantage in the race though it did first launch military space platforms, the SALYUT 1-7 series, of which many details are available.

Although the signatories to the OST had agreed in terms of Article XI to inform the secretary general of the UN, there is no information in the public domain that any country has to date, informed the secretary-general of the UN of their numerous military satellites that are in orbit.

international brake on the perceived dangerous ambition of its rival. A sentiment wholeheartedly reciprocated by the USSR. Both countries had supported inclusion of the principle of "peaceful use" and "scientific research for peaceful purposes" in the OST, because it was the perfect camouflage for the frenzied pace at which each proceeded to develop space technology capable for military applications, in the race to attain military supremacy over the other.

Not surprising, then, that although the signatories to the OST had agreed in terms of Article XI to inform the secretary general of the UN to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities in outer space, so that such information could be disseminated *immediately and effectively*, there is no information in the public domain that any country has, to date, informed the secretary-general of the UN of its numerous military satellites that are in orbit.

The devil lies in the self-defeating wording of the Article, a clear victory for the diplomats on either side of the table. Article XI requires the secretary-general to be informed, if the country in question considers such information to be "practicable" and "feasible" to furnish, a determination left entirely to that country in the absence of a test for such determination outlined in the treaty. Yet, on the flip side, it is the Outer Space Treaty 1967 and the principles enshrined therein, that proved to be a fortuitous tool for countries aspiring for their share of the pie in the sky. It was in the 1970s, with the development of satellite telecommunication and broadcasting technology, that the potential attributed to outer space changed dramatically. Outer space became a resource which would earn countries lucrative returns, while, at the same time, enable development. Almost overnight, the focus shifted from development of technology for military applications in space to the development of technology for civilian applications compatible with commercialisation of space. In

fact, we could quite easily draw a parallel between the late 20th century global debate on the direction and control of satellite orbits, with the 17th-18th century contest to control terrestrial trade routes[8]. Today, we have come a full circle. In our century, the weaponisation of space seems imminent and countries are concerned about the security of their access to, and assets in, space.

This paper is guided by the belief that a nation formulates a national security policy in response to developments beyond its boundaries that are perceived as threatening to its external and internal security, whether carried out by an individual nation or at a multilateral level. In the present context, the time is appropriate for India to articulate a space policy in the context of national defence. Therefore, it may be useful to analyse the parameters set out by the international space law regime to identify the dos and the don'ts, as it were. At the end of the day, leveraging outer space for national security must be synonymous with a policy that builds the architecture of sustainable space security for the country.

Against that background, this paper will briefly focus in Part I on: (i) an overview of relevant provisions of the UN Charter; (ii) international space law conventions; (iii) UN space principles; (iv) international institutional framework mandated to address space security issues. Part II of the paper will focus on India in the context of (i) the current legal regime for outer space in India; (ii) security concerns for India from space-related activities; (iii) leveraging outer space for India's national security.

PART I

(I) THE CHARTER OF THE UNITED NATIONS

The most general UN document which pertains to space is the UN Charter. As a Charter, it is a constituent treaty, and all members are bound by its Articles. Furthermore, the Charter states that obligations to the United Nations prevail over all other treaty obligations.

The Charter establishes the objective of peaceful relations between state actors,

8. Monroe E. Price "Satellite Broadcasting as Trade Routes in the Sky," WPTC-99-12, Programme in Comparative Media Law and Policy, Centre for Socio-Legal Studies, Wolfson College, University of Oxford, OX2 6UD, October 1999.

including their interactions in space. Article 2(4) of the Charter prohibits the threat or use of force in international relations, while Article 51 codifies the right of self-defence in cases of aggression involving the illegal use of force by another state(s).

> Article 51 states, *inter-alia*,
> *Nothing in the present Charter shall impair the inherent right of individual or collective self-defence if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security. Measures taken by Members in the exercise of this right of self-defence shall be immediately reported to the Security Council and shall not in any way affect the authority and responsibility of the Security Council under the present Charter to take at any time such action as it deems necessary in order to maintain or restore international peace and security.* (Emphasis provided).

In our world, an "armed attack" can be launched from all or any of the four dimensions: land; air; sea; and outer space. Consequently, all actions and developments undertaken by a state to put itself in a condition of constant preparedness to ensure national security and defend and repel a hostile attack from, or in, outer space, is in consonance with the UN Charter.

Today, the challenge is not only that outer space has become a crowded environment or that it has long since been militarised. The challenge is that outer space is under threat of being weaponised.

Today, the challenge is not only that outer space has become a crowded environment or that it has long since been militarised[9]. The challenge is that outer space is under threat of being weaponised. Two added dimensions that require critical consideration are: (i) the possible access, and use of, outer space by non-state parties, perhaps through a third party, to launch an attack against target nations; and (ii) the

9. Today, George W. Bush's America is actively talking putting in place a National Missile Defence with a focus on use of space-based platforms and concepts for anti-satellite kill weapons (ASAT). If the US implements such a policy, it would clearly be *ultra vires* the OST. But we must see this in context to President Putin's statement that Russia would use its technology to pierce that shield, if the US embarked on locating a missile defence shield in outer space.

possibility of a state (other than the US) launching a *preemptive attack* in/ from outer space to deal with perceived adversaries or for achieving its foreign policy goals.

(II) INTERNATIONAL CONVENTIONS ON OUTER SPACE

At the foundation of the five international conventions that govern human activities in outer space, including the moon and other celestial bodies, is that all human activity in outer space shall be carried out only for "peaceful purposes". The treaties establish the fundamental rights of access to space as well as state responsibility regarding space activities. They prohibit national appropriation and certain space military activities, such as the placing in orbit of objects carrying weapons of mass destruction.

However, questions have arisen as to the meaning of "peaceful purposes" in the context of the military use versus weaponisation of outer space. From the very beginning of the space age, the US has maintained that "peaceful" is synonymous with "non-aggressive." The Soviet officials, on the other hand, had favoured "peaceful" to mean "wholly non-military." In any case, the state practice over the last four decades has generally favoured the "non-aggressive" interpretation. Thus, space assets have been used to guide munitions, identify and track troop movements, surveillance and navigation. These military uses of outer space have stopped short, however, of weaponisation, which would involve the direct striking of targets from space, using conventional, nuclear or other means.

1967 Outer Space Treaty [10]

Often referred to as the Magna Carta of outer space, the Outer Space Treaty (OST) represents the primary basis for legal order in the space environment. However, it is important to note that the OST contains no verification or enforcement provisions.

Article I declares that outer space, including the moon and other celestial bodies, is "the province of all mankind" and "shall be free for the exploration

10. The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies opened for signature at Moscow, London and Washington, on January 27,1967. Source: 610 UNTS 205. (hereinafter referred to as 1967 Outer Space Treaty or 'OST')

and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law."

Pursuant to **Article II**, outer space, including the moon and other celestial bodies, is not "subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means." Unlike terrestrial practice, then, space cannot be nationally appropriated and does not belong to a single entity.

Article III, however, confirms that general principles of terrestrial international law – including rules of customary law – and the UN Charter are applicable to outer space. Therefore, the prevalent view is that Article 2(4) of the UN Charter applies to outer space and, as a result, it is unlawful for a state to interfere in a hostile manner with the space-borne assets of another state. Nevertheless, should such hostile actions occur, a state can legally use force to defend itself pursuant to Article 51.

Article IV contains the only provision of the OST dealing directly with military activities. Under paragraph 1 of this Article, the contracting parties "undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner."

In addition, paragraph 2 also stipulates that the "moon and other celestial bodies" are to be used "exclusively for peaceful purposes," with even conventional military installations, weapons testing, and manoeuvres expressly prohibited.

However, the OST does not expressly prohibit the development, testing, and deployment of conventional weapons in the expanses of outer space, nor does it prohibit the development, testing, and deployment of ground-based systems that can reach targets in space using conventional, nuclear, or directed-energy kill mechanisms.

As a result, **Article IV** has often been cited to support the claim that all military activities in outer space are permissible, unless specifically prohibited by another treaty or customary international law. For example, the Soviet Fractional Orbital Bombardment System (FOBS) was not covered by the OST, but new incarnations of an FOBS-type system are prohibited under the current SALT

II Agreement. However, neither the January 2007 Chinese anti-satellite (ASAT) test nor the US missile defence system is in violation of the OST.

Article VI of the OST provides that states are internationally responsible for "national activities in outer space," including cases where activities are "carried on [...] by non-governmental entities." Thus, the activities of non-governmental entities – such as the private sector – in outer space shall require "authorization and continuing supervision by the appropriate State Party to the treaty."

The importance of the common interest of all nations permeates the treaty text. In particular, **Article IX** stresses that parties to the treaty shall be guided by the principles of cooperation and mutual assistance in the exploration and use of outer space, and shall conduct their activities with due regard to the corresponding interest of all state parties to the treaty. **Article IX** further requires state parties to undertake international consultations before proceeding with any activity that would cause potentially "harmful interference" with the "peaceful exploration and use" of outer space by other states.

Since the term "harmful interference" is not defined in the treaty, the question could be raised about whether the words "harmful interference with activities in the peaceful exploration and use of outer space" also covers military activities in outer space. As of today, and as far as is publicly known, no state party has ever undertaken consultations pursuant to this provision.

1968 Rescue Agreement[11]

This agreement designates astronauts as "envoys of mankind," and as such accords them a kind of diplomatic immunity. Astronauts in distress are to be tendered assistance and rescued whether on sovereign or foreign territory. The agreement stipulates that astronauts and their spacecraft are to be returned promptly to the launching authority should they land within the jurisdiction of another state party.

11. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space opened for signature at Washington, London and Moscow on April 22,1968. Source: 672 UNTS 119 (hereinafter referred to as 1968 Rescue Agreement); 82 countries have ratified and 23 have signed the Agreement. ['Rescue']

1972 Liability Convention[12]

Article I of the Liability Convention defines the term "launching state". **Article II** mandates a two-tier liability system. In the first tier of cases, absolute liability for damage caused on the earth or to aircraft in flight is established. In other words, no proof of damage caused on earth or to aircraft in flight is required to receive compensation. In the second tier, **Article III** stipulates that damages to assets in space are to be compensated by the state at fault.

In both these cases, the convention reiterates that state parties remain responsible for the activities of their nationals and non-governmental entities. An important point to note is that it is the state, and not a private person whose space object has caused damage, that is directly held internationally liable. Therefore, a national legal system needs to be in place for the reimbursement of the compensation to the state which has been required to pay to the victim(s) of an accident by the space object of a non-governmental organisation (NGO). This obligation is most often fulfilled via regulations, national legislation, and licensing provisions, primarily via insurance requirements.

However, the evolution in the use of outer space into a more commercial and military-based environment is challenging the liability structure of this convention. For example, in dealing with concerns regarding the commercial use of global positioning system (GPS) signals, legal publicists do not agree on the applicability of the Liability Convention to aviation accidents caused by erroneous satellite navigation signals. Another issue of concern, related to the growing number of private and international actors undertaking space launches is the definition of the term "launching state."

1974 Registration Convention[13]

The convention establishes a mandatory system of registration of space objects

12. Convention on the International Liability for Damage Caused by Space Objects opened for signature at London, Moscow and Washington on March 29, 1972, Source: 961 UNTS 187 (hereinafter referred to as 1972 Liability Convention); 74 countries have ratified and 27 countries have signed the convention. ['Liability']
13. Convention on Registration of Objects Launched into Outer Space. Adopted by the General Assembly of the United Nations, at New York, on November 12, 1974, Source: 1023 UNTS 15 (hereinafter referred to as 1972 Registration Convention) 37 countries have ratified and 4 have signed the convention. ['Registration']

launched into orbit and beyond, with registries to be maintained at the national **(Article II)** and international **(Article IV)** levels.

It is mandatory to report to the secretary-general of the United Nations such data as (i) the date and location of the launch; (ii) the changes in orbital parameters after the launch; and (iii) the recovery date of the spacecraft. This central registry's purported benefits are the effective management of traffic, enforcement of safety standards, and imputation of liability for damage.

However, the convention remains an incomplete tool. First, information is to be provided "as soon as practicable," which in practice can take weeks, if not, months. Second, states are not obliged to disclose the true function of the satellite, but only the "general function of the space objects." To date, not even a single launching registered has ever been described as having a military function. Third, the convention does not require a launching state to provide appropriate identification markings for its spacecraft and its component parts.

Various proposals have been advanced to resolve its enumerated shortcomings. The proposals reflect the convention as an instrument via which some outer space activities of military value may be governed. This view, however, is not shared unanimously. Some countries are of the opinion that the Registration Convention is neither an arms control nor a confidence-building instrument, but a legal instrument establishing an international registry of space objects for the purpose of giving practical effect to the Liability Convention.

1979 Moon Agreement[14]

This agreement generally echoes the language and spirit of the OST in terms of the prohibitions on aggressive behaviour on and around the moon, the installation of weapons, weapons of mass destruction (WMD), military bases and other non-peaceful activities.

Of the five multilateral treaties devoted entirely to outer space, the Moon Agreement is the most recent and enjoys the least support. The apprehension of the

14. Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (hereinafter after referred to as the 1979 Moon Agreement). Source: UN doc. A/RES/34/68 of December 5, 1979. The agreement has been ratified by 10 countries while 5 countries have signed the instrument. [Moon].

UN member states about whether the provisions of the Moon Agreement will serve their individual national interests is obvious from the fact that to date there are just eleven ratifications (Australia, Austria, Belgium, Chile, Kazakhstan, Mexico, Morocco, Netherlands, Pakistan, Philippines and Uruguay) and five signatories (India France, Guatemala, Peru, and Romania). Perhaps it is not a coincidence that although most nations, particularly the US and Russia, have ratified the Outer Space Treaty 1967, they are unwilling to ratify the Moon Agreement 1979.

Vast natural resources are said to be locked in that celestial body. Moreover, the moon has the potential to be used for establishing military stations thereon. Such enterprises will be technology and capital intensive. Governments will have to harness private investment[15]. That will be possible only if tangible collateral security for such investment is made available. The best collateral for investment is property. Investment will, therefore, be conditional upon getting title to property *in rem*. Such a proposition would be in direct conflict with the principle of prohibition of "national appropriation" of any part of outer space. Nor are the principles of "province of all mankind", "peaceful purpose", "non-discrimination", "equality", "non disruption of existing balance of its environment by harmful contamination", "free access" and "dissemination of information" enshrined in the various international space treaties seen as conducive to achieving the political objective of conducting foreign policy that successfully meets the demands of domestic business, driven by scientific discoveries and technological developments enabled within the framework of the OST 1967.

(III) UN SPACE PRINCIPLES

In addition to the treaties, there are four sets of UN Principles which have been adopted by the General Assembly for regulating special categories of space activities.

15. The American industrial establishment seems to be deeply involved in the new strategic doctrine and is nurturing this approach for obvious industrial and economic gains. Speaking at the Space Foundation's 17th National Space Symposium in April 2001 in Colorado Springs, the executive Vice-President of Lockheed Martin Space Systems Co., Mr. Albert E Smith said, " Space is the next theatre [US must] control to ensure superiority." According to him, the implementation of a 'space control' doctrine should be implemented in three stages, the last of which would involve new space capabilities including " a space-based laser system and a military space plane." Cited in W.B. Scott, "Space Control Issue Finally Moves to Centre Stage," *Aviation Week and Space Technology*, April 23, 2001.

1. 1962 Principles Governing the Use of States of Artificial Earth Satellites for International Direct Television Broadcasting.[16]
2. 1986 Principles Relating to Remote Sensing of the Earth from Outer Space.[17]
3. 1992 Principles Relevant to the Use of Nuclear Power Sources in Outer Space.[18]
4. 1996 Declaration of International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States Taking into Particular Account the Needs of Developing Countries.[19]

(IV) INTERNATIONAL INSTITUTIONAL FRAMEWORK MANDATED TO ADDRESS SPACE SECURITY ISSUES

The United Nations General Assembly & Committee on Peaceful Uses of Outer Space, New York (UNGA) & (COPUOS)

The COPUOS is a permanent body of the United Nations General Assembly (UNGA) and the primary agency responsible for making space laws. Its resolutions, based on consensus, are passed in the UNGA. The fact that no new international space law has been possible since the 1979 Moon Agreement is a telling commentary, although there have been UN sponsored agreements on specific space-related activities. COPUOS been unsuccessful in persuading states to ratify the Moon Agreement. Nor has its ceaseless effort to encourage member states to adopt national space legislation met with much success.

International Telecommunications Union, Geneva (ITU)

The ITU is a UN agency that is responsible for managing the two most limited and highly prized natural resources in outer space – orbital slots and radio frequency – critical for every space related activity.

The current applicable 2006 ITU Constitution and Convention govern the international use of the finite radio spectrum and orbital slots used by satellites

16. UNGA Resolution 41/65.
17. UNGA Resolution 47/68.
18. UNGA Resolution 47/68.
19. UNGA Resolution 51/122.

for communications purposes. The two most important articles of the convention are **Articles 35 and 38**.

Article 35 stipulates that "all stations, whatever their purpose, must be established and operated in such a manner as not to cause harmful interference to the radio services or communications of other members...." Endangering, obstructing, or degrading the signal of another space asset using one's own signal would fall under the category of "harmful interference," as defined in the convention under Annex 2.

Article 38 exempts military telecommunications from the convention, though they must nonetheless observe measures to prevent harmful interference as much as possible. Additionally, parties are allowed to stop the transmission of any private telegram or telecommunication that is threatening to state security or which appears to pose such a threat.

Finally, the constitution states that radio frequencies and the geo-stationary orbit "must be used efficiently and economically so that countries or group of countries may have equitable access to both." In the case of the GEO orbits allocated by the ITU, the principle has been interpreted as meaning that such positions should be made available on a first-come first-served basis.

However, ITU has been dogged by controversies pertaining to procedure for allotting orbital slots /spectrum. The ceaseless efforts by the developing countries to access space resources have been noteworthy. The case of warehousing of orbital slots or paper satellites in the context of the Tonga Sat case and the Bogotá Declaration by the equatorial countries of Central and South America succeeded in shaking the developed world's monopoly of space resources.

***Conference on Disarmament, Geneva* (CD)**

Established in 1979, the CD is a multilateral forum established by the international community for negotiating multilateral arms control and disarmament agreements. The CD is not formally a UN organisation. However, it is linked to the UN through a personal representative of the UN secretary-general, who functions as the secretary of the conference. The CD has 65 members, including all the nuclear weapon states.

The most important achievement of the CD was its success in negotiating a multilateral agreement on the Resolution on the Prevention of an Arms Race in Outer Space (PAROS).

The voting patterns at the CD that have clearly demonstrated nearly unanimous support for the PAROS Resolution, suggest a consistent and widespread desire on the part of states to expand international law to include weapons in space. However, US opposition to the CD has kept it deadlocked since 1998. Consequently, no formal work on PAROS has been possible.

Elimination of the self-imposed prohibition on space-based conventional weapons between the US and USSR-Russia, immediately renewed concerns about the potential for the weaponisation of outer space.

Furthermore, in 2002, the US unilaterally withdrew from the 1972 Anti-Ballistic Missile (ABM) Treaty on the limitation of the anti-ballistic missile systems used in defending areas against missile-delivered nuclear weapons. Thus, the elimination of the self-imposed prohibition on space-based conventional weapons between the US and USSR-Russia, immediately renewed concerns about the potential for the weaponisation of outer space.

The shift was reflected in 2005 when Israel and the US voted against the PAROS Resolution, registering the first opposition votes in its history. To counter the negative vote, Russia tabled a new resolution, inviting states to provide inputs on measures to promote transparency and confidence-building in outer space. In addition, China and Russia submitted a non-paper to the CD on Definition Issues Regarding Legal Instruments on the Prevention of Weaponisation of Outer Space.

The present ground reality was expressed as recently as June 15, 2007, when United Nations Secretary-General Ban Ki-Moon suggested to CD member states that it was critical to adopt a decision to start substantive work in the conference, supplemented if necessary to overcome any reservations, that would have a positive impact on the international security atmosphere. He went on to suggest that if the conference did not move forward, it would have a devastating impact on multilateral and bilateral disarmament efforts.

World Trade Organisation, Geneva (WTO)

As a result of the increasing diversity of activities of space-related activities, legal issues pertaining to outer space have been emerging increasingly in different international fora. International trade and access issues are increasingly being addressed in the WTO. In fact, the WTO has an annex concerning telecommunications services.

International Institute for the Unification of Private Law (UNIDROIT)

UNIDROIT is playing an important role in developing an international instrument that will facilitate the private financing of space assets, potentially improving access to space.

International Civil Aviation Organisation, Montreal (ICAO)

Firstly, the ICAO has mooted the idea of developing an international instrument for the global navigation satellite systems (GNSS) in the context of CNS/ATM once consensus is established among member states. However, presently there is a clear division of views between the US, which does not support an international legal regime for GNSS and the Europeans, who support it. Most countries that are proposing or already have regional navigation satellite systems, have tended to support the US. The lack of consensus is basically on the question of whether or not the 1972 Liability Convention should be applicable in cases of aviation accidents caused because of the failure of satellite navigation signals.

Presently, India has not yet articulated a space policy.

Second, the ICAO has added to the Council Agenda the question of sub-orbital flights in the context of international civil aviation. This will inevitably lead to a debate on the delimitation of airspace and outer space.

PART II

(I) CURRENT INDIAN LEGAL REGIME FOR OUTER SPACE

1. Presently India has not yet articulated a space policy

2. India has not enacted national space laws as yet. As such, state practice is rooted in terms of Article 53 of the Constitution of India which empowers the executive to fulfil international treaty obligations.
3. The Department of Space has spelt out its goals in the Citizen's Charter.
4. The SATCOM Policy, which is part of the 1999 New Telecom Policy, is the only policy statement on space enabled activity. It is limited to permitting the Ku Band for satellite communications.

   The SATCOM policy is implemented in terms of (i) norms, guidelines and procedures for implementation of the SATCOM Policy dated January 12, 2000; (ii) and Procedure for Implementation of the SATCOM Policy issued on May 8, 2000, both issued by Indian Space Research Organisation (ISRO).
5. Current norms for IRS data distribution, both nationally and internationally.

(II) SPACE RELATED SECURITY CONCERNS FOR INDIA

Satellite Imagery and National Security

Security concerns have been expressed by the government about ready access on the Internet of high resolution satellite images of sensitive locations within the country which have the potential to be used by terrorists against the country.

Consequently, because America monopolises the Internet, it is proposed that the Ministry of External Affairs should hold bilateral discussions with the US and that the Ministry of Information Technology should hold meetings with the concerned private commercial companies. However, success can be met only if all American private satellite operators/distributors respond to our concerns and the US Administration agrees to establish a monitoring and enforcement mechanism.

The problem arises because presently IRS data products, including unedited high-resolution data, are distributed internationally through an exclusive marketing contract between the Antarix Corporation Ltd and Space Imaging, USA. As such, IRS satellite imagery distributed worldwide

In India, one can access sensitive and critical information in complete anonymity.

will remain subject to US law until 2010[20].

Domestic users are served by the National Remote Sensing Agency, Hyderabad, on receipt of advance fee by way of a demand draft. IRS data is distributed to domestic users against advance payment by way of bank draft, after 'sensitive' topography is first blocked out.

Yet it is no secret that competing foreign suppliers are transmitting the same data, edit free, directly to users via the Internet. Google Earth is the obvious example. In India, one can access sensitive and critical information in complete anonymity.

Given the perceived challenge to national security, from non-state parties and hostile nations, is it worth enquiring whether IRS data marketed through Space Imaging, USA, is a possible source of supply of sensitive information about India? Or, if in the absence of law to the contrary, the existing grey market is legal? Or what kind of legal regime will ensure easy access to reliable IRS data without compromising national security? Finally, is the time appropriate for India to revisit its current IRS data distribution policy?

Secondly, it is also proposed for India to seek an international protocol on security concerns arising out of earth observation satellites and an international agreement to make mandatory prior permission of sensed states.

In this context, it is useful to recall that diverse political ideologies and power positions have made consensus in negotiating international law on remote sensing almost impossible. Competing arguments ranging from the policy of 'prior consent' to the 'open sky' doctrine have informed debates thus far. Typically, developing countries support the prior consent principle on the

20. Historically, by launching the world's first civilian satellite LANDSAT-1 in 1972, the US signalleed that it would not restrict remote sensing exclusively for military purpose. By 1992, US global market dominance in civilian reconnaissance was challenged, prompting President Clinton to enacted a law to help private operators/distributors gain future commercial opportunities in the global data market by supporting investment in new technologies and removing unnecessary restrictions on dissemination of privately gathered data remote sensing systems. Nonetheless, alive to the security needs, American companies are mandated to deploy commercial remote sensing satellites under the "Shutter Control" regime which allows the Department of Commerce legal authority to limit the collection and distribution of commercial satellite imagery when national security, foreign policy interests or international obligations are deemed to be compromised.

ground that remote sensing violates the territorial integrity of a sensed state. The US and Western powers, however, support an 'open sky.' Indeed, the adoption of the 1986 UN Principles Relating to Remote Sensing of the Earth was a hard earned achievement.

Principle XII is illustrative. It mandates that the "sensed state shall have access to data concerning the territory under its jurisdiction on a non-discriminatory basis and on reasonable terms and conditions." The primary organising principle of terrestrial law is 'sovereignty'. Thus, the right of a sensed state to control resources within its territory was recognised. The right "to explore" and "to use" outer space is the organising principle of space law. Thus, the right of developed countries to acquire imagery by remote sensing was also recognised. But the textual protection for sensed states is negated because they do not have jurisdiction over foreign satellite operators who collect/ disseminate remote sensed images of their territories. Moreover, no formal definition of "sensed state" exists, although it is a commonly accepted term in international and US domestic remote sensing laws.

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India has articulated its concern in the 2002 UNCOPUOS Legal Sub-Committee, that the "legitimate rights and interests (of sensed states) are compromised (i) if they have no definite means to know whether their territory is imaged by commercial operators; and (ii) if they have no access to the data of their territories on a non-discriminatory basis soon after they are imaged." But there is no international consensus on the subject.

A national policy, backed by substantive and procedural law in respect of both passive and active remote sensing satellites, including issues of licensing, access, distribution, security (issues of low-level data and high-level data), copyright and

protection of data rights is a security requirement. Legal issues in earth observation include data policy, particularly vis-a vis-private enterprise licensing (whether to license certain activities or licensing certain entities to undertake certain activities); good conduct ; financial responsibility; obligatory insurance or reimbursement; operational knowhow; technical competence certification; minimum safety requirements; whether to respect nationals or territories in a manner in consonance with international obligations; dispute resolution; and whether it would be a criminal breach of national law to operate such a satellite system without a licence.

Web Security

The security threat from social networking websites like Facebook, Orkut, Myspace, Friendster, among others, in particular in respect of the armed forces, is the latest challenge for the intelligence agencies. It is reported that personnel have been exchanging classified information that poses a serious security risk.

An appropriate policy with both upstream and downstream guidelines/procedures is urgently required. It may also be considered whether the Army; Navy; and Air Force Acts should be appropriately amended to cover such offences.

FDI Policy for Telecommunications

A question was raised in the context of the Hutch/Vodafone acquisition deal, about whether permitting Orascom (which holds shares in the Pakistani telecom incumbent) to continue to hold shares in Hutchison, the majority shareholder in Hutch Essar, will be a security risk.

There is a current foreign direct investment (FDI) proposal from Malaysia Telekom, in which Saudi Telecom holds equity interest, for Aircel, the service provider. It has been clarified that Saudi Telecom will have to obtain permission separately from the government for this deal to be approved in the present shareholding pattern of Malaysia Telekom.

Sub-Orbital Flights: International Civil Aviation and Defence

There is no formal definition of outer space. However, it is accepted that

airspace ends and outer space begins at 100 km or 62 miles above the earth. There is no doubt that sub-orbital flights will be commercialised in the foreseeable future. The commercial use of the "sub-orbit" will have implications for both international civil aviation and national security.

There is no formal definition of outer space. However, it is accepted that airspace ends and outer space begins at 100 km or 62 miles above the earth.

It will be imperative to reconcile the mandate of **Article I** of the **1944 Chicago Convention**[21] which recognises "that every State has complete and exclusive sovereignty over airspace above its territory"; and the mandate of **Articles I & II** of the **1967 OST** which define outer space as the "province of mankind" which is not subject to national appropriation.

Thus, the pressure to redefine the boundary of airspace/outer space will emerge. It is suggested that the stand to be adopted in this matter should be formulated sooner than later, given its critical implications, even if not immediately articulated in public fora.

Commercial Space Launch Services and National Security

Security concerns in respect of commercial launch services have international and national implications that are difficult to distinguish in separate contexts. Typically, national security concerns cover issues that pertain to (i) export control regime to prevent proliferation of dual use technologies; and (ii) validation, certification and monitoring systems to ensure that non-state parties cannot access launch services or that the country offering launch services does not inadvertently become a victim of the 'flag of convenience' syndrome.

Although, such access by non-state parties to Indian launch service facilities may not be foreseeable since an applicant seeking grant of licence to establish a private satellite system[22] is required to get a security clearance certificate from

21. Convention on International Civil Aviation. Signed at Chicago, on December 7, 1944. Source: ICAO Doc. 7300/6 (1980).
22. Ministry of Information and Broadcasting www.mib.nic.in.

Define India's security objectives and outline a space strategy together with procedures/law to provide overall direction and objectives.

Ministry of Home Affairs in terms of the guidelines issued by the Ministry of Information and Broadcasting before ISRO actually launches the satellite, such access to launch service facilities offered by other countries cannot be ruled out.

(III) LEVERAGING OUTER SPACE FOR INDIA'S NATIONAL SECURITY

1. Define India's security objectives and outline a space strategy together with procedures/law to provide overall direction and objectives.
2. Clearly draw the line between 'acceptable' uses of space to support national security and 'unacceptable' uses that would cut across India's wider security objectives and policies or jeopardise the peaceful and civilian uses of space on which our quality of life and security now rely.
3. Clarify the nexus between the national defence and security policy which may be oriented towards military as well as civilian purposes and the 'peaceful purposes' mandate for India's space activities.
4. To avoid confusion and duplication, India's competence in security and defence should be openly addressed, clarified and managed, taking into account the dual use character of much of the technology and capabilities.
5. Classification of India's space assets.
6. Proactively protect Indian access to, and assets in, space through both technological and political initiatives, including space situation awareness.
7. Coordinate policies and strategies to enable India to play a more significant and effective role in strengthening the international legal regime and developing rules of the road for space activities and uses.
8. Formulate a policy and strategy to prevent the weaponisation of space.

CONCLUSION

It is clear that national security is symbiotically linked to the rapid changes taking place in the global space industry, bringing new challenges every day. Finally, the development of space security doctrines, embedded in national

security goals, of new space weapons systems; threat of weaponisation of outer space; new arms race; the obscuring boundary between airspace and outer space; incalculable commercial gains from space related activities; shrinking natural resources in outer space; and non-state and hostile entities with resources at their command all demand that the moment is not too early to rework India's national security policy to empower it with an appropriate space policy, together with attendant procedures and legislation within its fold.