**Countering Anti-Satellites through Legal& Policy Reforms**

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***Abstract***

*“As the space age unfolds, Man's first responsibility is to prevent the extension of his earthly conflicts into outer space.” - Author Goldberg.*

*This paper traces the importance of space non-weaponization in terms of security in outer space. In absence of any common transparency among various space faring nations, it might eventually lead to an arms race in the outer space thereby compelling developing countries like India to develop such space weapons. After defining what an ASAT is and describing its development in different periods of time, it highlights the existing legal instruments dealing with the use and deployment of ASAT’s. While dealing with the Outer space treaty, the paper tries to find out the existing loopholes and whether an amendment or revision of OST is feasible or advocating an international code of conduct for use of space weapons is the solution. It discusses the concepts of “militarization” and “weaponization” of outer space and identifying their difference and status in future. In line with the legal provisions, this paper provokes concrete debate on how ASAT’s particularly can invoke a war in outer space. Thus, suggesting the immediate need of reforms in space laws and policies.*

**I. Introduction**

The prevention of the weaponisation of and an arms race in outer space has attracted the attention of the world for decades now. With the growing ability of mankind to explore and use outer space, the danger of the weaponisation of and that of an arms race in outer space has become increasingly imminent. Once an arms race occurs in outer space, it would inflict awesome catastrophe on mankind. Being aware of this danger for some time, the international community is striving to conclude international legal instruments to regulate human activities in outer space, especially with the aim of restricting the weaponisation of space. The United Nations General Assembly included the Prevention of an Arms Race in Outer Space (PAROS) on its agenda in the late 1950s and since then, thanks to the concerted efforts by all countries, several international treaties related to outer spaces have come up.

Humankind is standing at the crossroads of such legally enforceable application of sanctions on outer space warfare. The idea of concluding a legal instrument to stop the dangerous military use is wining more and more support and becoming an important step in assuring security in outer space for all. Out of all the space weapons, Anti-Satellites (ASAT), seem to be more destructive and hazardous, comparatively.

***I.A.* *Definition of Anti-Satellites***

ASATs, also referred to as satellite interceptors and hunter-killer satellite,[[4]](#footnote-5) are artificial celestial bodies which possess the ability to interfere with the purpose of other space objects.[[5]](#footnote-6) To accomplish this objective, ASATs may make use of any of following three lethal mechanisms; the first type utilizes kinetic energy and disables its target by explosive fragmentation or by a simple non-explosive collision;[[6]](#footnote-7) a second type employs a directed-energy system, such as a high energy laser, in order to incapacitate or interfere with other space objects;[[7]](#footnote-8) and a third type uses radiation from a nuclear explosion to neutralize a space object[[8]](#footnote-9). The ASAT is generally part of a larger anti-satellite weapons system which, in addition to its lethal mechanism, includes “sensors, control and instrumentation necessary for target acquisition, aiming, firing and damage assessment.”[[9]](#footnote-10)

An example of a multi-purpose space object cum system would be the United States space shuttle and its programme. One of its functions, according to the, now defunct, Soviet Union, is to serve as an ASAT,[[10]](#footnote-11); It has been observed that once the shuttle manoeuvres close to another space object, it can use a remote manipulator system[[11]](#footnote-12) to either place destructive devices on the object or to bring the object on board the shuttle and thereby claiming it as the property of the United States.[[12]](#footnote-13)

***I.B. Development of ASATs***

*United States of America***:** The ASAT Policy of the United States has varied under different Presidents. In the late 1950s, the then President Dwight D. Eisenhower set the United States space policy on such a vector that the policy, at least in essence, has sustained to this day.[[13]](#footnote-14) The United States preached for the 'freedom of space,' 'space for peace' and 'space for all mankind.' In actuality, however, a thread in American policy that stemmed from traditional idealism and respect for the rule of law on one hand and, from Cold War competition for prestige on the other.[[14]](#footnote-15)

During an early U.S. programme initiated in the late 1950's, delayed indefinitely later on in the mid-1960s,[[15]](#footnote-16) a limited anti-satellite project was initiated as part of America's anti-ballistic missile (ABM) development programme.[[16]](#footnote-17) However, this project was terminated in 1975.[[17]](#footnote-18) It is believed that between 1957 and 1968, American efforts in the ASAT field were primarily responses to concerns regarding Soviet deployment of orbiting nuclear weapons in space.[[18]](#footnote-19) Another project, code- named as “Saint” (satellite interceptor),[[19]](#footnote-20) involved an American effort to develop a payload that would have the capability of co-orbiting with, as well as inspecting, unknown space objects.[[20]](#footnote-21) Such a system may have had the potential to directly interfere with the functioning and purpose of other orbiting space objects.[[21]](#footnote-22) “Saint” was terminated before any test flights were made.[[22]](#footnote-23) However, before leaving office, President Gerald Ford ordered the rapid development and deployment of an American ASAT to counter the Soviet weapon.[[23]](#footnote-24)

Jimmy Carter entered the Presidency in 1977 with a philosophy of ‘maximum pacification of space.’ During his tenure, budget allocated for the development of ASATs was considerably reduced and limited.[[24]](#footnote-25)After the Reagan Administration which was unable to deploy an operational ASAT force,[[25]](#footnote-26) the Clinton White House supported the space should be viewed as a sanctuary, and therefore did not support “kill” weapons or what was considered by many as “adventurous” military space programmes.[[26]](#footnote-27) A more or less same stance is followed by the current Obama Administration.

*Soviet Russia:*Soviet ASAT testing and development may have started as early as 1962.[[27]](#footnote-28) Kinetic-type ASATs were tested in orbit around the earth between 1968 and 1971.[[28]](#footnote-29) The Soviets discontinued testing in 1971, possibly in deference to the Strategic Arms Limitation Talks (SALT).[[29]](#footnote-30) However, Soviet testing unexpectedly resumed in 1976[[30]](#footnote-31) and ultimately developed the Soviets developed their own operational ASAT system. Through the kinetic system, the Soviet satellite would aim to manoeuvre near the targeted space object and explode, thus knocking out the target by the debris created by such an explosion.[[31]](#footnote-32)

**II. International Law on Space Weaponisation**

***II.A. Militarization and Weaponisation of Space***

A distinction must be made between ‘militarization’ and ‘weaponisation’ of outer space. One may comprehend that militarization of space began with the launching of the earliest communications satellites serving military objectives, whereas weaponisation can be understood with reference to the placement in orbit of weapon systems that could attack targets in space or on the Earth. While there has been no specific deployment and stationing of weapons in space yet, there are satellites that could be manoeuvred to act as weapons to disable or destroy the space assets of others. Although to this day no authoritative definition of the term ‘space weapon’ exists,[[32]](#footnote-33) the term could be construed to mean space-based devices that have, directly or indirectly, a destructive capacity[[33]](#footnote-34). Meanwhile, satellites[[34]](#footnote-35) themselves have no destructive capacity and their support of military missions is not considered weaponisation of space[[35]](#footnote-36). While some aspects of the militarization of space are accepted, in the form of treaties, conventions and bargains, there exists a firm international policy against military space technologies that are used for conventional war fighting.[[36]](#footnote-37) Therefore, when considering questions of space security, it must be understood that though space has not yet been specifically *weaponized*, it has already been, and continues to be, militarized.[[37]](#footnote-38)

***II.B. United Nations Committee on Peaceful Uses of Outer Space (COPUOS)***

In 1958, in order to mandate the activities and resources of the United Nations and its agencies as well as other international bodies relating to the peaceful uses of outer space and to consider the legal problems arising in programmes pertaining to outer space exploration, the General Assembly decided to set up an *ad hoc* Committee on Peaceful Uses of Outer Space.[[38]](#footnote-39) The focus of the agenda of the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS) is the delimitation of outer space and the character and utilization of the geostationary orbit, a central legislative body dealing with space and space activities.[[39]](#footnote-40) Advances in space technology and the need for international co-operation in the exploration and use of outer space require more specific and detailed rules to govern new activities. One urgent issue, high on the agenda of the UNCOPUOS, is adequate regulation of the use of nuclear power sources in outer space.[[40]](#footnote-41)

In 1959, the General Assembly established the Committee as a permanent body and reaffirmed the same through its mandate, UN Resolution 1472 (XIV). Further, the need to provide a focal point international co-operation in the peaceful exploration and use of outer space was formulated in Resolution 1721 (XVI) of 20 December 1961[[41]](#footnote-42) that asserted the provision for exchange of information relating to space activities from governmental and non-governmental bodies and to assist in promoting international cooperation in outer space activities.

Amidst the cold war in the 1960s, the two superpowers alone possessed the satellite launching capabilities, which placed them in a dominant position in treaty making for outer space. Among the procedures which were not in the framework of COPUOS was the agreement between the USSR and the USA, *“of their intention not to station in outer space any objects carrying nuclear weapons or any kind of weapons of mass destruction,”* but nevertheless, called upon all states to refrain from such activities.[[42]](#footnote-43) Moreover, there were various resolutions passed by the GA on outer space during this period, such as Resolution 1884 (XVIII) of 17 October 1963[[43]](#footnote-44) and Resolution 1962 (XVIII) of 13 December 1963, signifying the importance of the subject.[[44]](#footnote-45)

***II.C. Partial Nuclear Test Ban Treaty***

The States which are parties to this treaty are prohibited to use of and testing of weapons that case ‘nuclear explosions’ in outer space, against satellites or missiles for the purpose of disrupting telecommunication or any other.[[45]](#footnote-46)

This is criticized on the grounds that; One, some nuclear states, such as France and China, are not parties to the Treaty; Two, there exist some ambiguities in the term ‘nuclear explosions’ as it is implicitly refers only to naked nuclear explosions and not to small enclosed nuclear explosions; Three, the intention of the Treaty is essentially to ban nuclear tests in time of peace and not intended to regulate the use of nuclear weapons at the time of war or its equivalent.

***II.D. Anti Ballistic Missile Treaty***

Although the 1967 Space Treaty leaves a wide possibility for the use of and stationing of every kind of weapon in outer void space except nuclear weapons and weapons of mass destruction; certain restrictions were sought to be tabulated between the United States and the Soviet Union with regards to anti-ballistic systems by virtue of this Treaty[[46]](#footnote-47).

The Anti-Ballistic Missile Treaty has been abrogated and thus impaired the international laws on the restriction of development and deployment of space weapons. The legal framework has been further weakened by the abolition of the Treaty. Law is therefore no obstacle to deployment.

***II.E. Outer Space Treaty, 1967***

The 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies,[[47]](#footnote-48) generally called the Outer Space Treaty, is the primary basis of all international space law. The treaty was negotiated by the United States and the Soviet Union in order to end the costly space race between them.[[48]](#footnote-49) The OST has been called both ‘The Constitution for Outer Space’ and ‘The Magna Carta of Space’.[[49]](#footnote-50) It is a quasi-constitution document, meant not only as to serve the purpose of culmination of authority but also an initiation of regulating space warfare.[[50]](#footnote-51) The principles contained by the treaty are also the bedrock of the Convention on International Liability for Damage Caused by Space Objects (Liability Convention),[[51]](#footnote-52) Convention on Registration of Objects Launched into Outer Space (Registration Convention)[[52]](#footnote-53) as well as the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (Astronaut Rescue Agreement)[[53]](#footnote-54). Article IV is the key provision of the Space Treaty and it is this very provision that directly affects ASAT’s and prohibits space weaponisation.

***II.F. Weapons Prohibited Under Article IV***

Article IV of the Space Treaty prohibits ‘nuclear weapons or any other kinds of weapons of mass destruction.’ The same phrase was first used in U.N. Resolution 1884.[[54]](#footnote-55) Unfortunately, the terms ‘nuclear weapons’ and ‘weapons of mass destruction’ have never been defined.

***II.G. Existing Ambiguities of the OST***

There remain multifarious loopholes and ambiguities in the OST which are widely debated and contradicted by different space lawyers. One such Space Lawyer Ezra Reinstein is of the opinion that, “The Outer Space treaty is riddled with ambiguities. It is silent, outside of affirming freedom of ‘exploration and use’, as to what sort of rights parties can claim in celestial bodies. It is silent as to the circumstances under which these unspecified property rights might vest, that is, what a person must do to gain whatever property rights are available.”[[55]](#footnote-56)Another prominent space lawyer Rosanna Sattler wrote in the University of Chicago Law Review, “The provision of the Outer Space Treaty which has caused the greatest controversy and discussions found in Article II The appropriation provision of the treaty is arguably unclear and undefined and therefore unworkable.”[[56]](#footnote-57)

The use of the phrase ‘any objects carrying’ in the very second line of Artcle 4[[57]](#footnote-58) of the OST, if strictly interpreted, would ban only objects carrying specified weapons and not the weapons themselves.[[58]](#footnote-59) Thus, a satellite carrying a prohibited weapons system is banned. However, if the satellite itself is the weapon, it may not be prohibited by this phrase. Perhaps this is the loophole United States seeks to exploit by developing a ‘ramming/collision’ ASAT which is itself a weapon rather than an object carrying a weapon.[[59]](#footnote-60) Article IV (l) prohibits objects carrying weapons with unconventional lethal mechanisms. It does not prohibit objects carrying conventional weaponry. New weapons that cannot be categorized as conventional or non-conventional will be banned if their impact is one of catastrophic proportions. If the object is the weapon, it may not be prohibited.

Article IV (2) which includes the ‘peaceful purpose’ clause, apparently does not add any further limitations to ASATs. The Article states that, “the moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes.” Hence, on its face, peaceful purposes apply only to “the moon and other celestial bodies.” The omission of the term ‘outer space’ probably was not accidental.[[60]](#footnote-61) The drafters of the Space Treaty did not intend to enact a broad prohibition of military activity, and thus carefully constructed Article IV accordingly.[[61]](#footnote-62) Thus, the absence of the term ‘outer space’ in the peaceful purpose clause appears to be a clear manifestation of their intent.[[62]](#footnote-63)

**III. Remedies Suggested: Revision of the OST, 1967, and following up of an International Code of Conduct**

***III.A. Possibility of Revision***

As the Outer Space Treaty functions like a constitution, opening it for revision means that all of its provisions will be vulnerable to change. It has been argued that ‘revision’ would be a narrow approach that can be contained and controlled, and that it is unnecessary to assume revision can or will lead to an amendment process, which, according to this view, is a broader approach that can be avoided.[[63]](#footnote-64) This view fails to take into account that the Outer Space Treaty, unlike the Liability Convention and the Registration Convention, which do provide for revision, provides only for substantial amendments while securing its own essence.

The interest groups and nations that advocate a new, single space agreement, another indicator that an Outer Space Treaty revision process will inevitably expand to the entire space treaty regime is the treaty drafters’ intention that the space treaties be interrelated.[[64]](#footnote-65)

Moreover, the long-standing dichotomy between nuclear capable/developed nations and the non-nuclear capable/developing nations is shifting, as is the dichotomy between developed nation/space farer and developing nation/non-space farer:[[65]](#footnote-66) Nuclear and space activities are being rearranged. In light of the changes in the terrestrial nuclear regime, it is not at all clear that the Outer Space Treaty’s nuclear weapons ban in space would survive a revision conference.[[66]](#footnote-67)On the other hand, by recognizing and defining what constitutes ‘peaceful’ or ‘scientific’ activities, it would not necessarily expand the categories of permitted military actions, while revising it altogether might.

The United Nations was first asked to consider the legal issues associated with space activities in 1958. The Outer Space Treaty entered into force in 1967.[[67]](#footnote-68) It took nine long years for materializing this international treaty. Today, the likelihood is that discussions would be less focused and more wide ranging; and once opened, attempted revisions could lead to decades of debate and negotiations. At the same time, the ability to implement already developing technologies could outpace negotiations. A variation on the theme of the role of ambiguity during a revision process is that there will be some nations that will have no incentive to resolve new ambiguities that, in their view, replace settled but inconvenient treaty obligations.[[68]](#footnote-69)

Due to the above discussed reasons, revision of the entire OST seems to be ill logical and impractical.

***III.B. International Code of Conduct as the Ultimate Solution?***

The peaceful uses of outer space can also be advanced by a Code of Conduct that clarifies ‘rules of the road’ for responsible space-faring nations. Codes of conduct were negotiated during the Cold War to prevent dangerous military practices and accidents by the superpowers on the ground, in the air, and at sea. The Bush administration endorsed some codes of conduct, including the 2003 Proliferation Security Initiative;[[69]](#footnote-70) around 91 countries subsequently signed on to the core principles of this code of conduct.[[70]](#footnote-71)

In December 2007, The European Union issued a draft Code of Conduct for Outer Space Activities. The EU’s draft Code strongly affirms the principle of no harmful interference against space objects, including the freedom of access to, exploration and use of outer space for peaceful purposes without interference, fully respecting the security, safety and integrity of space objects in orbit and the responsibility of States to take all the appropriate measures and cooperate in good faith to prevent harmful interference in outer space activities.[[71]](#footnote-72)

Though this International Code of Conduct seems to be more cogent, its compliance can again raise serious doubts, yet certainly, a much better alternative than going for a complete revision of OST.

**IV. Global Impact of Space Weaponisation on Space Faring Nations**

In line with the mission of formulating a legal framework to prevent situations where the use, or threatened use, of space weapons might work to exacerbate tensions or even catalyse war concluding that potential negative consequences from the use of space weapons ( including the possibility of triggering a nuclear response from an enemy) and while the Outer Space Treaty[[72]](#footnote-73) only explicitly bans ‘weapons of mass destruction’ from outer space, global political opinion tends strongly to the view that any weapon in outer space violates the spirit of that Treaty – both of which cannot be dismissed in order to avoid an arms race and to propagate a peaceful use of Outer Space, provoking a concrete debate on how space weapons might impact future national and global security is in question.

There are two paths by which orbital space might become a battleground for human conflict; one consists of dramatic, hard-to-miss trigger events such as the use of nuclear weapons to attack orbital assets; and the other class involving more gradual changes such as a series of small, seemingly innocuous steps over a period of years that would be recognized as having crossed the boundary from force enhancement to force application, in hindsight.”[[73]](#footnote-74)

To intuitively predict the possible consequences, it is argued that, one, the U.S. anti-satellite (ASAT) programs[[74]](#footnote-75) are likely to inspire and aid the ASAT programs of others[[75]](#footnote-76); two, Russia and China are likely to change their nuclear postures[[76]](#footnote-77) in response to expanding U.S. military capabilities in outer space; three, increasing the readiness of their forces at the expense of operational control; four, the space-enabled war-fighting strategies tangle nuclear and space forces together in a way that creates unnecessary risks of accident – such as a piece of space debris striking a Russian early-warning satellite that could be interpreted as an attack; and five, unilateral deployment of space weapons[[77]](#footnote-78) could spark an international backlash which compromises the interests of many other diplomatic efforts of those nations which have initiated such revisionary policies. This could make it more difficult to achieve goals on other strategic interests that would lead to the possibility of conflicts escalating into space, threatening not only to military uses of outer space, but also to space exploration and other peaceful uses of space.

The current global perception is that the United States has a technical lead in the military use of space[[78]](#footnote-79). This strategic advantage may lead other nations to accelerate their space security efforts. This might trigger an arms race;[[79]](#footnote-80) Russia and China believe that they must respond to this strategic challenge by taking measures to dissuade the United States from pursuing space weapons and missile defences. Their response will likely include developing more advanced ASAT weapons, building more intercontinental ballistic missiles, extending the life of existing ballistic missiles, adopting countermeasures against missile defences, developing other asymmetric capabilities for the medium of space, and reconsidering commitments on arms control.[[80]](#footnote-81)

Some critics[[81]](#footnote-82) argue that this regime has already stunted space development; and assert that the United States[[82]](#footnote-83), as the lone superpower and preeminent space power, should establish a benign hegemony of free-market sovereignty in space.

On the other hand, Russia continues to support its military space program, especially the development of early-warning and communication satellites, but not space weapons or anti-satellite capabilities[[83]](#footnote-84) and consistently seems to adhere to its moratorium on ASAT testing[[84]](#footnote-85) while insisting against space weaponisation and in support of a treaty banning the stationing of any type of weapons in outer space and renouncing the use or threat of use of force in outer space. The reaction of Russia[[85]](#footnote-86), whose military strength still relies heavily on its nuclear weapons capability, to such a threat would also act to counter the initial deployment of space weapons with those of its own since any attempt to move from the nuclear deterrence paradigm would reduce its power.

China is increasing its defence budget by 17.5 per cent, or $3 billion,[[86]](#footnote-87) in order to build an improved array of military space weapons.[[87]](#footnote-88) It is also investing heavily in space and has publicly announced plans of lunar exploration. It is unlikely that China would want to be restricted though it has proposed a treaty banning space weapons in the UN Conference on Disarmament.[[88]](#footnote-89) While the US and Russia lead in capacity,[[89]](#footnote-90) the European Union,[[90]](#footnote-91) China[[91]](#footnote-92) and India[[92]](#footnote-93) all have the requisite technical capabilities for at least certain space weapons systems. Given a first move by another state, the US is likely to act quickly to ensure dominance in this domain.[[93]](#footnote-94)

**V. Potential ASAT Development in the Indian Subcontinent**

India is a state that may pursue ASAT capabilities,[[94]](#footnote-95) if other states do so first. India doesn’t have a formal anti-satellite weapon policy of attacking satellites in space; however, India perceives itself as a victim of geopolitics rather than an actor who provokes negative reaction.[[95]](#footnote-96) This attitude surfaced several times over the course of the conference and was used to explain why their ASAT program should not be of concern to others. The chief of the Indian Air Force, S. Krishnaswamy, recently remarked that, “Any country on the fringe of space technology like India has to work towards such a command as advanced countries are already moving towards laser weapons platforms in space and killer satellites.”[[96]](#footnote-97)

Pakistan has a much smaller industrial base, but has long attempted to match Indian deployments – particularly in military matters. Pakistan is likely to emulate Indian ASAT efforts, given the enmity between the two countries and the relative advantage that India derives from the use of space for military operations.

**VI. CONCLUSION**

Military use of space continues to be largely dominated by the United States. Militarization realists believe that if the United States takes the lead in weaponizing space, it would become easier for other states to follow due to lower political and technological barriers. For these reasons it is believed that fighting *into* space looks feasible and we should plan for the eventuality. It has also been suggested that fighting *in* space shows little promise, while fighting *from* space looks impractical for the foreseeable future, with or without treaties. Thus, there is a need to withdraw from the current space regime.

To sum up, given the global character and the importance of outer space activities, the development of space military capabilities leading to an escalation of an arms race in outer space and the expanding space economic activities require the creation of a favourable legal framework, reassessment and advanced revision of the existing legal frameworks. Calling on an elaborate review of the OST by not reducing the relevancy of the Treaty, advocating the prohibition on testing and deployment of space weapons, one as designated as an ASAT weapon, and also proposing the International Code of Conduct which is binding on all space-faring nations, are some of the recommendations put forth in order to achieve the goal of operational cooperation among all space-faring countries needed for global space security. A standard of verification equal to the standard needed for armed conflict in outer space should be sufficient, since both defence- and arms control-oriented solutions for safeguarding space security seek to ensure that no nation gains a consequent military advantage over others, which has the potential to trigger off an arms race.

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4. Christol, *Article Four of the 1967 Principles Treaty: Its Meaning and Prospects For Its Clarification*, in Proceedings Of The Twenty-First Colloquium On Outer Space, 192 (M. Schwartz ed. 1979) [hereinafter *Christol*]. [↑](#footnote-ref-5)
5. *Id.* at 193. ASAT is sometimes used in a broader sense to include systems with earth-to-space and space-to-earth launching capabilities. *See also* *Id.* at 207, ¶ 1. [↑](#footnote-ref-6)
6. Tsipis, *US-USSR Confrontation or Cooperation in Space*, in Nineteenth Strategy For Peace: Conference Report 15 (Stanley Foundation ed. 1978) [hereinafter *Tsipis*]. [↑](#footnote-ref-7)
7. *Id*. Robinson*, Soviets Push for Beam Weapon*, AV. WEEK & SPACE TECH., May 2,1977, at 16 [hereinafter *Robinson*].\* [↑](#footnote-ref-8)
8. *Christol*, supra note 4, at 194. [↑](#footnote-ref-9)
9. *Tsipis*, *supra* note 6, at 15. [↑](#footnote-ref-10)
10. Soviets See Shuttle as Killer Satellite, Av. Week & Space Tech., Apr. 17, 1978, at 17; World Television Series, The Real War in Space, Transcript at 13 (WGBH Educational Foundation 1979). [Hereinafter *Shuttle*] [↑](#footnote-ref-11)
11. For a description of the remote manipulator system, *see generally* Grey, Enterprise 156 (1979). [↑](#footnote-ref-12)
12. *Shuttle, supra* note 10, at 17*.* The Soviets were then developing their own reusable shuttle which is supposed to possess the same capability. Covault, *Soviets Build Reusable Shuttle*, Av. Week & Space Tech., Mar. 20, 1978, at 14. [↑](#footnote-ref-13)
13. Maj Howard D. Belote, *The Weaponisation of Space: It doesn’t happen in a Vacuum,* Aerospace Power Journal-Spring 2000 p. 1. [↑](#footnote-ref-14)
14. Walter A. Mcdougall, *The Heavens and the Earth: A Political History of the Space Age* (Baltimore: Johns Hopkins University Press, 1985), 194. [↑](#footnote-ref-15)
15. *Christol*, *supra* note 4, at 194. [↑](#footnote-ref-16)
16. *Id.* [↑](#footnote-ref-17)
17. 4 [↑](#footnote-ref-18)
18. Joan Johnson-Freese, *The Viability of U.S. Anti-Satellite Policy: Moving towards Space Control,* INSS Occasional Paper 30, Space Policy Series, (Colorado: USAF Academy, 2000), p. 4. [↑](#footnote-ref-19)
19. *Tsipis*, supra note 6, at 18. [↑](#footnote-ref-20)
20. Staff of Senate Comm., On Aeronautical and Space Sciences, 94th Cong., 2d Sess., Report On Soviet Space Programs, 1971-75 Overview, Facilities and Hardware, Manned and Unmanned Fight Programs, Bioastronautics, Civil and Military Applications, Projections Of Future Plans 395 (Comm. Print 1976). [↑](#footnote-ref-21)
21. *Id.* [↑](#footnote-ref-22)
22. *Id.* [↑](#footnote-ref-23)
23. Paul C. Warnke, former head of the Arms Control and Disarmament Agency and now Special Consultant to President Carter, described the potential arms race in space as, “much more expensive than past earthbound programs.” The New Military, Business Week, June 4, 1979, at 145 [hereinafter *The New Military*]. The United States planned to quadruple its yearly space defense spending due to successful Soviet antisatellite (ASA T) tests. Middleton, *Soviet Tests Producing Increase in U.S. Space Defense Research*, N.Y. Times, Feb. 15, 1977, at 8, col. 3 [hereinafter *Middleton*). *See* *No Time to Hunt in Space*, N.Y. Times, Oct. 14, 1977, at 26, col. 1 [hereinafter *Hunt in Space].* [↑](#footnote-ref-24)
24. *Id.* [↑](#footnote-ref-25)
25. *Supra note 18* at 9. [↑](#footnote-ref-26)
26. *Id.* at 19. [↑](#footnote-ref-27)
27. “A Soviet anti-satellite development and testing program may have had its origins back in 1962, when Vostok III and IV were manoeuvred to within 5 km. off each other.” H. Scoville, Jr. & K. Tsipis, Can Space Remain A Peaceful Environment? 16 (Stanley Foundation Occasional Paper No. 18, 1978) [hereinafter *Scoville & Tsipis*]. [↑](#footnote-ref-28)
28. A more suspect program started several years\later when on October 19, 1968, the Soviet Union orbited Cosmos 248 and a day later launched Cosmos 249 in a rendezvous trajectory. The trailer satellite, Cosmos 249, was observed to pass rapidly by the presumed target, Cosmos 248, and then exploded. The procedure was repeated ten days later with Cosmos 254, which also passed near 248 and exploded, again leaving Cosmos 248 intact. A similar experience was repeated two years later on October 20, 1970 and involved satellites Cosmos 373, 374 and 375, with the last two exploding after passing near the first one. In no case was the supposed target satellite destroyed. All of these satellites were launched with the large SS-9 launcher. [↑](#footnote-ref-29)
29. The Strategic Arms Limitation Talks (SALT) are a series of negotiations between the United States and the Soviet Union that began in November 1969. U.S. Dep't Of State Bureau Of Public Affairs, Salt II Agreement 54 (Selected Document No. 12A 1979). [↑](#footnote-ref-30)
30. *Scoville & Tsipis*, *supra* note 27, at 6. See Soviets Test Another Killer Satellite, Av. Week & Space Tech., Jan. 2, 1978, at 21 [hereinafter *Soviets Test*]; *Christol*, *supra* note 4, at 194. [↑](#footnote-ref-31)
31. *Id.* at 21. [↑](#footnote-ref-32)
32. For example, according to a definition proposed by a group of UNIDIR experts, “A space weapon is device Stationed in outer space (including the Moon and other celestial bodies) or in the earth environment designed to destroy, damage or otherwise interfere with the normal functioning of an object or being in outer space, or a device stationed in outer space designed to destroy, damage or otherwise interfere with the normal functioning of an object or being in the earth environment. Any other device with the inherent capability to be used as defined above will be considered as a space weapons.” While this type of definition includes also ground, sea and air based weapons in the category of space weapons, more recent definitions refer mainly to space based weapons. [↑](#footnote-ref-33)
33. For example, satellites serving GPS navigation of military aircraft and precision guided missiles. [↑](#footnote-ref-34)
34. Satellite systems that identify and direct war on the earth, which essentially allow for “full spectrum dominance” are not acceptable but de-escalation of all military systems for fighting war on Earth or in space is seen as the stabilizing with the treaty verifying satellite technologies commonly shared globally. [↑](#footnote-ref-35)
35. S. Estabrooks, “Opposing Weapons in Space”, Ploughshares Monitor (Autumn 2002) *available at* http://www.ploughshares.ca/content/monitor/mons02a.html (last visited Mar. 31, 2012) [↑](#footnote-ref-36)
36. Leonard David, “Space Weapons for Earth Wars,” *Space.com,* 15 May 2002, *available at* http://www.space.com/business technology/technology/space\_war\_020515-1.html (last visited Mar. 31, 2012). [↑](#footnote-ref-37)
37. Cited by Rebecca Johnson, The Simons Centre for Peace and Disarmament Studies, Liu Institute for Global Issues, UBC, Canada; Outer Space and Global Security, conference; 26-27 November 2002 Space Security: Options and Approaches *available at* http://www.ploughshares.ca/libraries/Abolish/outerspaceconfgeneva02/johnsonconf2002.htm (last visited Mar. 31, 2012). [↑](#footnote-ref-38)
38. UN Resolution 1348 (XIII). [↑](#footnote-ref-39)
39. UN Doc. A AC. 105 430 at 4 (1989). Not all states believe, however, that there is a need for the legal definition of the boundary between air space and outer space. In particular, the U.S. has traditionally expressed the view that the absence of a definition or delimitation of outer space has not created and will not create practical problems for the progress in the exploration of outer space. The U.S. representatives urge the UNCOPUOS to drop this matter from the agenda of its Legal Sub-Committee. U.N. Doc. A AC.105 PV.332 at 17-18 (1989) (statement of the U.S. representative in the outer space committee). For a presentation of this approach on the doctrinal level; *see* Hosenball & Hofgard, 57 U. Colo. L. Rev. 885-893 (1986). [↑](#footnote-ref-40)
40. U.N. Doc. A AC.105 430 at 4 (1989). [↑](#footnote-ref-41)
41. This resolution regulates the activities of States and of members of the United Nations wherever such activities may be deployed in Outer Space. [↑](#footnote-ref-42)
42. G.A. Res. 1884 (XV11I), of 17 October, 1963. [↑](#footnote-ref-43)
43. After the conclusion of the Moscow Nuclear Test Ban Treaty, the US and the Soviet Union declared their intention not to station in outer space any objects carrying nuclear weapons or other kinds of weapons of mass destruction. This Resolution solemnly calls on all States to similarly not to do so. [↑](#footnote-ref-44)
44. Following the agreement on the Nuclear Test Ban Treaty between the Soviet Union and the United States, this resolution declares the Legal Principles Governing the Activities of States in Exploration and Use of Outer Space and emphasizes on the need for the States to be guided by the principles enunciated therein. [↑](#footnote-ref-45)
45. Article I of the 1963 Nuclear Test Ban Treaty. [↑](#footnote-ref-46)
46. Article V (I) of the Limitation of Anti-Ballistic Missile Systems says “Each party undertakes not to develop, test or deploy ABM systems or components which are sea-air-space-mobile-land based.” [↑](#footnote-ref-47)
47. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies art. 11, Jan. 27, 1967, T.I.A.S. No. 6347 [hereinafter Outer Space Treaty]. [↑](#footnote-ref-48)
48. 14 U.S. State Dep’t, Space Goals After the Lunar Landing 13–16 (1966) *available at* http://www.space-settlement-institute.org/Articles/research\_library/spacegoals1966.pdf (this document was declassified pursuant to a Freedom of Information Act request by one of the authors of this Article). [↑](#footnote-ref-49)
49. *Supra* note 18 at 10. [↑](#footnote-ref-50)
50. George S. Robinson and Harold M. White, Jr., 1986, Envoys of Mankind: a Declaration of First Principles for the Governance of Space Societies, Washington, DC, Smithsonian Institution Press, p. 181. [↑](#footnote-ref-51)
51. Convention on International Liability for Damage Caused by Space Objects, 29 March 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187(hereinafter Liability Convention). [↑](#footnote-ref-52)
52. Convention on Registration of Objects Launched Into Outer Space, 14January 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 (hereinafter Registration Convention). [↑](#footnote-ref-53)
53. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched Into Outer Space, 22 April 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 (hereinafter Rescue and Return Agreement). [↑](#footnote-ref-54)
54. G.A. Res. 1884, 18 U.N. GAOR, Supp. (No. 15) 13, U.N. Doc. A/5571 (1963). [↑](#footnote-ref-55)
55. Ezra J. Reinstein, Owning Outer Space, 20 NW. J. INT’L L. & BUS. 59, 71 (1999).A different expert, who disagrees with us about private property, Milton L. Smith, nonetheless comes to the same conclusion about the Outer Space Treaty’s ambiguity. Milton L. Smith, The Commercial Exploitation of Mineral Resources in Outer Space, in *Space Law: Views Of The Future,* 47 (Tania L. Zwaan et al. Eds., 1988).Smith expresses his personal opinion that authorities who adopt the “literal interpretation of the non-appropriation clause” and considers that the non-appropriation clause applies only to nations go too far. *See also* *Id*. at 47. Then he debates whether the Outer Treaty also bans taking exclusive possession of minerals mined on the Moon, but concludes it does not. *See also* *Id*. at 48–50. He writes: In summary, mining is a permissible exercise of the freedom of use guaranteed by the Outer Space Treaty. Both the non-appropriation and the freedom of use provisions, however, raise potential problems for exclusive claims in outer space. The language of the Outer Space Treaty is so broad and general that these provisions are susceptible to varying interpretations. Since disagreement on these issues exists, the Outer Space Treaty, of itself, cannot provide a satisfactory legal regime *Id.* at 50. He also says there are two ways to create a “commercially suitable legal regime:” a new U.N. agreement, which he considers unlikely, or a private agreement among the space faring nations, reached outside of the U.N., which he says “would be fully compatible with the Outer Space Treaty.” *Id.* at 54. [↑](#footnote-ref-56)
56. Rosanna Sattler, Transporting a Legal System for Property Rights: From the Earth to the Stars, 6 Chi. J. Int’l L. 23, 28–29 (2005). [↑](#footnote-ref-57)
57. Article 4 of OST states: “State Parties to the Treaty undertake not to place in orbit around the Earth ‘*any objects carrying’* nuclear weapons or any other kinds of weapons of mass destruction…” [↑](#footnote-ref-58)
58. *Supra* note 41. [↑](#footnote-ref-59)
59. *Shuttle*, *supra* note 10, at 17. The United States is evaluating three ASAT systems, a homing intercept warhead system which operates as a heat-seeking rocket-powered ramming device. [↑](#footnote-ref-60)
60. S. Gorove, *Studies In Space Law: Its Challenges & Prospects*, 88 (1977) [hereinafter *Gorove*]. [↑](#footnote-ref-61)
61. Robinson, *Militarization and the Outer Space Treaty - Time for a Restatement of “Space Law”*, Astronautics & Aeronautics, Feb. 1978, at 27 [hereinafter *Robinson, Militarization*]. [↑](#footnote-ref-62)
62. *Gorove*, *supra* note 60, at 88-89. [↑](#footnote-ref-63)
63. Joanne Irene Gabrynowicz, *The Outer Space Treaty and Enhancing Space Security,* Published in Building the Architecture for Sustainable Space Security—Conference Report, 30–31 March 2006, United Nations Institute for Disarmament Research (UNIDIR), 2006. [Hereinafter *Joanne*]. [↑](#footnote-ref-64)
64. Walter A. Mcdougall, 1985, The Heavens and the Earth, a Political History of the Space Age, New York, Basic Books, Inc., p. 431. [↑](#footnote-ref-65)
65. Joanne Irene Gabrynowicz, Comments on the Discussion Paper, Space Law and Remote Sensing Activities, Workshop on Space law disseminating and Developing International and National Space Law: The Latin America and Caribbean Perspective, United Nations Office of Outer Space Affairs (UNOOSA), Rio de Janeiro, 22–25 Nov. 2004, UN Doc. ST/SPACE/28, *available at* www.unoosa.org/oosa/en/spacelaw/workshops/index.html (last visited Mar. 31, 2012). [Hereinafter *Irene*]. [↑](#footnote-ref-66)
66. *Joanne*, *supra* note 63. [↑](#footnote-ref-67)
67. The Outer Space Treaty opened for signature on 27 January 1967 and entered into force on 10 October 1967. See United Nations Office of Outer Space Affairs, United Nations Treaties and Principles on Space Law, *available at* www.unoosa.org/oosa/en/spacelaw/treaties.html (last visited Mar. 1, 2012). [↑](#footnote-ref-68)
68. *Joanne*, *supra* note 63. [↑](#footnote-ref-69)
69. Michael Krepon & Samuel Black, *Space Security or Anti-satellite weapons?* Space Security Project 2009, Te Henry L. Stimson Center, p. 28. [↑](#footnote-ref-70)
70. *Id.* [↑](#footnote-ref-71)
71. *Id.* at 31. [↑](#footnote-ref-72)
72. Ram Jakhu, “Legal Issues Relating to Global Public Interest in Outer Space”, *CISSM Working Paper*, October 2005, *available at* www.cissm.umd.edu/documents/jakhuspace.pdf (last visited Mar.31, 2012). [↑](#footnote-ref-73)
73. Barry D. Watts *The Military Use of Space: A Diagnostic Assessment* (Washington, D.C.: Center for Strategic and Budgetary Assessments, February 2001), 98. [↑](#footnote-ref-74)
74. Some argue that the tremendous value provided by space-based military systems is also very vulnerable to attack, creating perverse incentives for a U.S. President to rapidly escalate conflict in a crisis situation. [↑](#footnote-ref-75)
75. History suggests that if one strong player on the international arena gets too powerful, then the other smaller players may combine to produce a counterbalance. The dominant state should therefore not only consider the chance of single nations countering their actions, but the risk of many nations combining initiatives. Such behaviour was in clear display by Germany, France, Russia and China, during the lead up to the war in Iraq. [↑](#footnote-ref-76)
76. A 2003 Report of the US Department of Defence on the Military Power of the People’s Republic of China notes that Beijing leaders believe that US poses a “significant”, long-term challenge to their country. [↑](#footnote-ref-77)
77. The United States still professes its commitment to the peaceful uses of space, but US military planning documents now assert that peace is best protected by unilateral space dominance—i.e. Having the ability to see anything in and from space, to attack anything that is deemed dangerous, to defend all US space assets, and to control other countries’ access to and use of space. [↑](#footnote-ref-78)
78. United States Space Command (USSC) circulated a document ‘Vision for 2020’ in 1998 which portrays the militarization of space as a result of “natural historical progression” (United States Space Command, 1998, *Vision for 2020*, p. 4, at www.fas.org/spp/military/docops/usspac/visbook.pdf). [↑](#footnote-ref-79)
79. For example, the deployment of an ASAT could instigate the development and deployment of a ‘DSAT’ to counter an ASAT. Such an arms race might also blur the distinction between conventional and mass destruction weapons in space. [↑](#footnote-ref-80)
80. Pavel Podvig and Hui Zhang, *Russian and Chinese Responses to U.S. Military Plans in Space* (Cambridge, MA: American Academy of Arts and Sciences, 2008), p. v–vi, http://www.amacad.org/publications/militaryspace.pdf [Hereinafter referred to as Povdig]. [↑](#footnote-ref-81)
81. Everett Dolman among others in his *Astropolitik* develops a comprehensive space power theory, resurrecting the “terrains” of space, space faring states, space technologies. [↑](#footnote-ref-82)
82. At least 50 satellites support the US military operations, providing reconnaissance data, communication links for troops on the ground, aircraft in flight and ships at sea, precise targeting data for cruise missiles and smart bombs, instant warning of hostile missiles launches, weather forecasting, commercial TV programming for US forces, and many other services. Another 27 satellites that form the Global Positioning System played an essential role in the Iraqi conflict by providing indispensable navigational information for the troops on the ground and aircraft in flight. According to the Air Force Undersecretary, Peter Teets, who is also the head of the National Reconnaissance Office (NRO), the Iraqi war will be seen as “the most integrated and precise military engagement in history”, mainly due to a greater use of space-based equipment (Reuters, “Iraq Boosts Space Spending”). Space is becoming the “ultimate high ground of the 21st Century warfare [M. Woods, *Satellites Provide Vital Reconnaissance, Communications to War Effort*, Pittsburgh Post-Gazette (Apr. 2, 2003). [↑](#footnote-ref-83)
83. *Povdig*, *supra* note 80. [↑](#footnote-ref-84)
84. L. Skotnikov, Permanent Representative of the Russian Federation, Statement at the Plenary Meeting of the Conference on Disarmament, “Prevention of an Arms Race in Outer Space” Geneva (26 August 2004). [↑](#footnote-ref-85)
85. The Soviet Union tested a “co-orbital interceptor” – essentially a satellite loaded with explosives and launched into the same orbit as its target. The “interceptor” was designed to orbit the Earth until it caught up with the target and exploded. The test record for this system was unimpressive, although no one knows how the system would have functioned in a real war. [↑](#footnote-ref-86)
86. According to the March 2002 reports; the DoD report estimated that China’s annual spending on the military could increase in “real terms” three-to four-fold by 2020. [↑](#footnote-ref-87)
87. L. David, “Pentagon report: China’s Space Warfare Tactics Aimed at US Supremacy” SPACE.com (1 August 2003), online: SPACE.com website: http://www.space.com/news/china\_dod\_030801.html; Although Chinese officials deny that the government is pursuing ASATs (Zhang, 2004) and is maintaining an anti-weapons in space position, the most recent reports emanating from China make it clear that Chinese leaders see the development of military space capabilities as being of “pivotal importance” and military capabilities as a “key element in the Chinese armed forces modernization program” (AV. Week & Sp. Tech, 15 Nov. 2004). [↑](#footnote-ref-88)
88. The deployment of space weapons could create strong incentives to reverse this restraint, and increase the alert rates of Chinese forces. [↑](#footnote-ref-89)
89. Both the Russian ground-launched Galosh nuclear-tipped anti-ballistic missile system around Moscow and the American Space Shuttle have significant residual anti-satellite (ASAT) capabilities although neither system was designed primarily for that purpose; high altitude nuclear detonations can, in weeks to months, disable virtually all low-Earth orbit (LEO) satellites that have not been hardened against nuclear effects. The Russians explicitly challenged the potential of the U.S. Space Shuttle to serve as an ASAT weapon during the 1978-79 ASAT negotiations between the superpowers. [↑](#footnote-ref-90)
90. In regard to space weaponisation, the EU is a strong advocate for a space weapons ban and in June 2001 it co-sponsored with Canada a Joint Statement on Non-Proliferation, Arms Control and Disarmaments. [↑](#footnote-ref-91)
91. National Intelligence Council, *Foreign Missile Developments and the Ballistic Missile Threat Through 2015*, Unclassified Summary of a National Intelligence Estimate, December 2001 http://www.cia.gov/nic/pubs/other\_products/Unclassifiedballisticmissilefinal.htm [↑](#footnote-ref-92)
92. David Barboza, *China Launches Space Walk Mission*, International Herald Tribune, 26 September 2008. [↑](#footnote-ref-93)
93. Soon after the ‘Vision 2020’, the Donald Rumsfeld-chaired Space Commission tabulated that “*to ensure that the President will have the option to deploy weapons in space”* to deter threats to and, if necessary, defend against attacks on U.S. interests; (United States, 2001, *Report of the Commission to Assess United States National Security Space Management and Organization*, Washington, DC, Government Printing Office, p. 12 (emphasis added), at www.defenselink.mil/pubs/space20010111.html). [↑](#footnote-ref-94)
94. V.K. Saraswat, scientific advisor to India’s defense minister as quoted by S. Paneerselvam and P. Soma, *“Anti-satellite Weapons (ASAT): A Status Review and Perception for an Indian ASAT*,” presentation given at “Space, Science, and Security: The Role of Regional Discussion,” New Delhi, India, Jan. 19–21, 2011 said, “Space security involved a gamut of capabilities including the protection of satellites, communication and navigation systems and denying the enemy the use of his own space systems. These technologies would be developed as part of the country's totally indigenous Ballistic Missile Defence Programme.” [↑](#footnote-ref-95)
95. Statement by a former foreign secretary Kinwal Sibal. [↑](#footnote-ref-96)
96. *IAF enters space age, starts work on laser weapons, killer satellites*, The New Indian Express, Oct. 6, 2003. [↑](#footnote-ref-97)