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RESEARCH ARTICLE

THE END OF PEACEFUL SPACE: FROM MILITARIZATION TO WEAPONIZATION OF SPACE.

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Abstract

The history of mankind could be said to be synonymous with the history of conflict. Man being a social animal continues to ask questions concerning his wellbeing and security such that where these fundamentals of his livelihood are threatened, man resorts to the means available to him to protect himself. With the entrance of human component to space in 1957, man has continuously sought to establish himself as he has always done in every case of his expeditions to discover new lands and territories, as the master of space. Not minding space's vastness, our exploration of space has never looked back. Rather there has been an expanded global awareness of our collective and inextricable connection to the rest of our solar system and the space around us. Therefore, as long as we continue to ask questions of ourselves and the universe in which we live, our inquisitiveness will ultimately get the better of us. Such inquisitiveness being an inherent feature of humanity also promises to be the driving force for further incursions of man into new and further reaches of space. To optimize the processes surrounding space's exploitation increasingly sophisticated tools and assets would have to be used, relied on and ultimately protected by the owners and interested parties. This is where the military whose traditional sphere of operations and engagements demands utilization of force and its various instruments becomes inevitable or so it seems for the attainment of this protective and if needs be offensive requirements.

Introduction:-

Recent events around the world have shown the inevitability of assuming a complete understanding of the future directions that could be taken by chief decision makers and actors representing the major space exploring nations of the world. As with every social experiment, man's quest for further frontiers has led to the almost unanimous consensus that for mankind to survive and thrive, we must look outwards to space. This quest which begun with the earliest recorded events of mankind's asking seemingly trivial questions as to our origins, our position in the fabric of space-time and premonitions for the future of his existence on earth. What can be said is that space has evolved from being a thing of wonder to becoming a place where nations are positioned to garner social and economic dividends to be used in such a way that their national interests are firmly catered for [D. C. Hardesty].

As the fact of space exploration continues to accelerate towards a normalization of the idea that man's home of the future is outside of the earth and on some other planet that is either naturally habitable if found or made habitable by

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the sheer force of man's ingenuity. What can be seen are the plethora of examples of mankind's push to further reaches within our solar system. This is evidenced by the nature and scope of experiments conducted by large radio and optical telescopes on the ground that are constantly pointing into space [Ackermann *et al.*, 2014].The pioneering work of astronauts, scientists and engineers on the ISS, the data being collected from deep space probes which are meant to help us ask the right questions about life or validate already posited answers about the chance of life existing some other place within our solar system or outside of it. Commercial satellites that are offering multibillion dollar services that cater to different types of needs on earth are also another angle to be considered when viewing the uses to which man has put space. If lessons from past decades and our history of space faring should be used as another guide, the crewed Moon landings were such a profound pointer to the potential utilization of off-earth bases and staging posts for some kind of military event.

Since almost all social experiments have probably seen their fair share of upheavals and conflict, space being dominated by man will seem to fit the narrative for creation of potential conflicts to be had in space for whatever reasons may be created at the opportune time. With space being the domain for mostly national assets that are hard to develop, install and monitor, various nations have considered protecting those assets similarly to what obtains on earth. This need for protection has thrown up various suggestive means that always seem to revolve around the use of the military or military styled assets and techniques. While, there hasn't been any direct aggression between any two nations in space, a premonition of this has always been with us. John F. Kennedy's speech to students of Rice University in 1961 was both grave and prophetic as to the uses to which man could put space [M.N Schmitt]. Ultimately, it rests with mankind to decide which direction the issue of space militarization and weaponization will go.

The rest of this paper is organized as follows: Section 2 discusses the History of space Militarization with respect to various national actors, Section 3 looks at the weaponization aspects of space and finally concludes in Section 4.

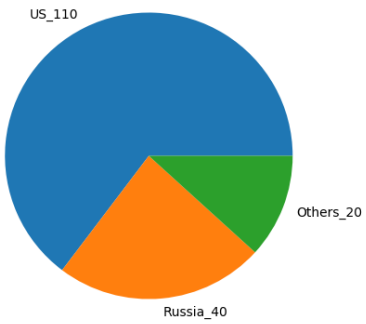
History of Space Militarization:-

The militarization of space is an inarguable fact that confronts anyone who looks at the numbers of visitors to space. Quite overwhelming, the numbers of astronauts (broadly used here to describe either astronauts, cosmonauts, taikonauts) who had and continue to have military background of some sought is disproportionately higher than those of their civilian counterparts. That fact was established quite early in the first days of man's exploration of space which begun in 1961 with USSRs Yuri Gagarin who was a Major in the soviet air force. Subsequently the US followed suit with all 6 crewed moon landings from 1969-1972, being manned or commanded by military personnel, a suggestion turned into a fact attributed to a former military leader and later president of the US, Dwight d. Eisenhower.

As a matter of fact, the records show [NASA astronauts] [International astronauts], that every nation that has ventured into manned space missions, has utilized the services of military personnel in all pioneer missions. Some of the reasons adduced for this includes their training, rigorous discipline, regimentation, rules of engagement [NASSA astronauts]. So, it is found that of the almost 563 individuals from all nationalities who have travelled into space, a disproportionate number of these had military backgrounds or active military training as at the time of their visit [Wikipedia list of astronauts].

The highly skewed number of space visitors in favor of the military as was previously revealed was a direct product of expedience, necessity and practical consideration in the early years of the space race. However with the softening of earlier nationalistic rhetoric and establishment of more avenues for cooperation, emphasis has shifted somewhat to a more heterogeneous composition of astronauts. Recent missions show the composition of astronauts to include a good number of civilians who have served as flight engineers, biologists, scientists, mission specialists. Therefore while the reasons and roles of the military in space can be looked at from different lenses, it goes without doubt that as long as mankind is present in space (either by proxy using his satellites and space assets or physically stationed outside earth) or anywhere within the space environment, reasons for military presence will continue to be put forward.

Again, as with the parallels seen in military expeditions we see that nations who actively engage their military partly do so to defend their assets, control a given territory (in this instance space), and project their military might via a show of force [B.M. DeBlois *et al*, 2004]. Therefore as mankind continues to develop new and sophisticated space-based installations which are deployed, here would always be a good reason by policy experts, thinkers and others who would hold on to the idea that the military in space is not just a necessary evil but a pragmatic decision that benefits the interests of the proponent. A 2001 report gives the number of American military spacecraft at 110, Russians at 40 and the rest of the world had 20[Pike John]. By 2013 a report by the World Atlas, placed the total numbers of military satellites at 320: 123 for the US, 74 for Russia, 68 for China and 59 in total for the rest of the world [World Atlas]. Figures 1 and 2 profoundly reflect the direction of space militarization and a normalization of the military assets deployment. The increase in space assets from 2001 to 2013 surely goes to show the increasing



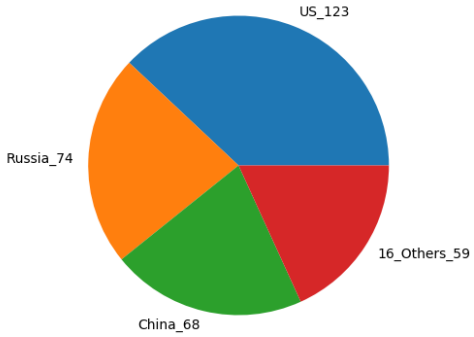


Figure 1a:-Military Satellites in Service (year 2001) **Figure 1b:**-Number of Military Satellites (year 2013)

choice made by nations to have a military presence. Chinese power and their clear intent at also projecting their increasing socio-economic and military might around the globe

US Military in Space:-

Statistic given previously shows that by a wide margin the US has a higher number of space asserts compared to any other nation on earth. Very strikingly, they have also been (weather clandestinely or notably) the most active military in space. The US air force's X37B space plane which is a robotic low altitude reusable space vehicle readily comes to mind with its very much publicized 500 days sojourn in space during one of its operations. This military asset which is based out of Vandenberg Airforce base, continues to make several space missions that are routinely observed but classified by the American military. Its missions and planners are without doubt the only ones with access to the information and reasons for its flights which sometimes happens upwards of three months at a time. Understandably, these missions are coordinated and directed at the behest of the American military and utilizes military personnel for its operations. Personnel that are not part of the civil NASA space program, therefore suggesting the existence of a parallel military space division within the American military establishment.

The US example of having parallel space agencies for civil and military missions might seem unique at first glance. However, it is well-established that this uniqueness is very much nuanced or absent. While NASA handles the civilian interests of America's space drive, the United States Space Command (USSPACECOM) which was later absorbed into USSTRATCOM handles the military equivalent. A differentiating characteristic of both agencies is the openness that accompanies any NASA launch while most launches of military assets is shrouded in secrecy and can only be discerned after launch by any of the various tracking stations around the globe with any detailed information about the mission remaining classified. Also the mission objectives that are well publicized and sometimes celebrated well before each NASA launch is not replicated in the military launch of their own satellites. This means, while the military is understood to be active in space, their activities, scope and reach in question is relatively unknown.

While it is widely accepted that space has always been militarized, with proof of this being in the installation of various spy satellites and surveillance capability onboard some traditional payloads, the weaponization of space is a prospect that although farfetched a while ago, is fast becoming an idea with a high probability of reality.

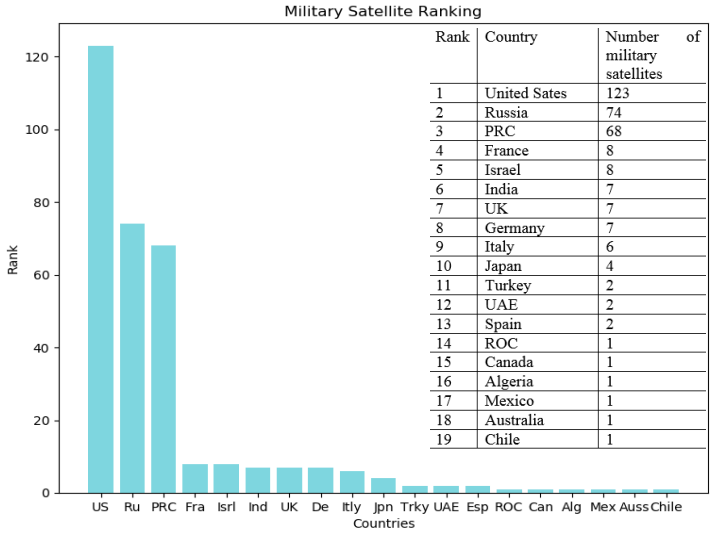
USSR and Russian Military in Space

Russia has from the earliest days of space exploration shown the potentials that exist for a normalization of weapon systems installed and used in space. Programs such as the 1960 Almaz planned for use of space stations as against satellites. Almaz saw to the construction of three stations named Salyut 2, 3 and 5 which were operational between 1973 and 1976 but became unmanageable because of funding constraints. These were abandoned for autonomous satellites such as the Kosmos 1 in 1962 that was replicated in 2017 by the newly built and launched Kosmos 2524 which was designed to detect, track, and destroy incoming satellites attacking Russia [World Atlas]. These recent efforts could however obscure the fact that space has always had actors who considered it their prerogative to utilize in either offensive or defensive designs. As early as 1961, reports already existed studying the direction that weapons in space was going to take. According to a soviet study in 1961 and declassified in 2002 by the American CIA, possible trajectories for space militarization and eventual weaponization was sated as fact and not conjecture as far back as then[Declassified CIA archives]. Another CIA Director report from 1968 and declassified in 2011 shows extensive space weapons capability of the Soviet union with a vast array of weapons systems such as ICBMs, MRBMs being handled by soviet strategic attack forces[Richard helms (Director of central intelligence), 1968,2011].

Other Military involvement in Space

Mention of recent tests of offensive weapons by developing countries must also be made here. The Chinese are considered next in terms of their military presence in space. As Figures 1 and 2 show, they seem ready to leapfrog other more established space exploring nations like the US and Russia going from their having almost zero military satellites in 2001 to now having over 68 by 2018. The Chinese Yaogan series of satellites are meant to be used for intelligence gathering at lower altitudes. The Chinese anti-satellite weapons program is also another established fact with the 2007 test of a satellite killing device putting paid to the prior suspicions about Chinese possession of such weapons [J. A. Lewis, 2014].

European nations also have their fair share of military satellites but with numbers considerably lower than those of US, Russia and China combined. Some smaller nations which manage military assets in space are also reflected in figure 3.



Rank	Country	Number of military satellites
1	United Sates	123
2	Russia	74
3	PRC	68
4	France	8
5	Israel	8
6	India	7
7	UK	7
8	Germany	7
9	Italy	6
10	Japan	4
11	Turkey	2
12	UAE	2
13	Spain	2
14	ROC	1
15	Canada	1
16	Algeria	1
17	Mexico	1
18	Australia	1
19	Chile	1

Figure 2:-Ranking of Countries by Numbers of Military Satellites in 2013

With this fact, the idea of space being a global commons of mankind[] for peaceful uses, quickly takes the back seat to who has the military might to decide who owns or can do what in space[]. the thought of this offensive use of space has long been considered and led to the creation of the committee for the peaceful uses of outer space(CoPUOS) treaty which was agreed to, signed and ratified by all countries of the world in 1967[Michael Horvestern],. This treaty more than any others outlined the role of actors in space and the limitations to space participants on payloads and type of vehicles kept in orbit around the earth. However, practical requirements to monitor and protect national assets has drawn calls from political leaders past and present for establishment of dedicated space commands or space force that is responsible for defending as countries assets and interests in space.

Therefore, while there has always been a recognition of military presence in space, the attention of space enthusiasts and explorers has begun to shift to the actual weaponization of space. This weaponization being driven by the somewhat primordial push towards domination of space by certain nations who are presently active in space. Very notably, John F. Kennedy averred in 1960 while still a sitting senator of the US that "Supremacy in space will be the substance of the next decade. The nation that controls space will also control the world"[CIA declassified archives].Therefore when in March of 2018, President Donald Trump of the US declared his interest to start a space command which would form the sixth branch of the US military, many saw this as maybe just another one of the president's widely overreaching declarations of intent. But fast forward three or so months to August 2018, and the reality dawned on anyone who was watching the president roll out his governments defense spending that, his was not a mere show of intent but a move well calculated and having the backing of certain principals within the American defense establishment. Whatever dissenting voices there might be, the fact remains that the momentum for creating a space force is already moving towards some form of realization.

1. Weaponization of space

The weaponization of space is no longer a foreboding thought that must be considered with search for indications as to the possible scenarios of its evolution. If history teaches us anything, it is the fact that space has always been seen as a theater for military operations. CIA declassified documents from 1961, just four years after man's first space endeavor with the Russian Sputnik, shows the Soviet concerns about already researched weapons such as the nuclear ordinance bombardment system(NOBS) for space-to-surface missiles(project PCBS) to be housed in low earth orbiting satellites. Other projects such as SLOB and SHAOB concerned strategic space missiles situated farther out in space [declassified CIA documents]. The soviets also had their own space weapons programs such as the Fractional Orbital Bombardment System (FOBS) [Assif A. Siddiqi, 2000].

More recently, evidence abounds as to the present state of installations in space that are known to possess purely offensive capabilities. The laser and kinetic weapons program of the Chinese is a prime example of guided laser munitions in space whose tests were have been widely publicized [J. A. Lewis, 2014].These tests were partly to garner national pride and also to show the world the available capabilities they have. Present day development of inertia weapons shows the potential that still exists [Barry D. Watts]. Although these tests have been targeted at the space assets of the weapon possessing nation's, their occurrence gives credence to the threat that exists if nations decide to turn their weapons against each other's space assets for the sake of gaining some advantage such as preventing surveillance, denying the collection of electronic intelligence or generally disrupting a considered adversaries space asset. Even the role of cyber security in space asset manipulation is becoming a real and present danger [], when viewed in light of the interconnectedness or networking of space and ground control assets. Employing high rate transmitters are other sources of disruption that could be found in space with targeted denial of service attacks and frequency interference attacks another possible source of aggression [D.C. Hardesty]. Moon bases have also long been given serious consideration and various scenarios put forward for underground bases and surface observation posts [CIA declassified documents].

Conclusion:-

In conclusion, we can say with some certainty that weaponization of space is not a thought akin to reaching at straws or fishing in the dark but a real and present reality. The continuous revisits to this issue by leading space nations shows the interests and significance placed on developing or acquiring this technology. More poignant is the continuous revision of policy and refinements being made to already established protocols and treaties for peaceful uses of outer space which might render them obsolete if not reinvigorated by the chief primary actors in this regard. For as long as this see-saw dialectic continues, which is certainly to happen the military question in space will keep being a recurring one. Also, the enthusiasm of new space entrants cannot be discountenanced as they bring another dimension to the role that past treaties play in the decisions and agreements of future space exploring nations. Are

new space faring nations bound by past treaties? Is there a global framework for retroactive concurrence to previously signed treaties targeting space use? Finally, is there a means of enforcement of the signed treaties to be used to make countries conform to stipulated rules of engagement in space. Some of these questions already have answers proffered but so long as space is considered an advantageous theatre to the military with an increasing part of the world's economy relying on the various satellites systems like weather, surveillance, global communication, reconnaissance, intelligence gathering, precision navigation etc. the military will always be close by to help secure these prized assets [M.N. Schmitt, 2006].

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