# ‘Peaceful uses’ of outer space has permitted its militarization—does it also mean its weaponization?

Johannes M. Wolff

The urge to transcend the heavens and explore the stars has always been a part of human consciousness, as evidenced by the myths of numerous cultures that describe journeys to celestial bodies. Ways of transforming those myths into reality have been explored for some time. Scientific discoveries of the seventeenth century, such as Johann Kepler’s work on the mathematical laws governing the motion of bodies in orbit or Isaac Newton’s research on gravity, were fundamental to the technical aspects of travelling to space and remain relevant to this day.

Despite the calls for the ‘peaceful use’ of outer space, it has been militarized from the very beginning of the space era. This article will introduce the reader to the history of the outer space debate, explore what is meant by ‘peaceful uses’, outline the key treaties and agreements, and look at both current and planned civilian and military projects and their relation to the militarization and weaponization of outer space.

## *History*

The modern space age began in the early twentieth century with technological developments in rocket and missile science. Building on the work of individuals like Hermann Oberth and Walter Homann, Germany was responsible for major progress in rocket science at the time of the Second World War. Immense government support led to the development of the V-2 rocket. Although the V-2 programme was enormously costly and the rocket had limited military value, it is acknowledged as being the first viable space rocket.

After the Second World War, a small group of German rocket scientists from the V-2 project were brought to the United States in order to continue their research, which became the basis of the first space rocket programme. The Soviet Union also had access to V-2 technology after the war. However, the post-war era was not one of rapid progress in the area of space exploration. The United States was engaged with rebuilding its economy and aiding Europe’s reconstruction. Despite the emerging preoccupation of countering the unfolding Soviet threat, America’s superior airpower was considered sufficient to address this concern. For the Soviets, however, development of long-range missiles was critical to counter American air superiority.[1]

As the United States found itself in the Cold War struggle with the Soviet Union, it recognized that it was heavily dependent on the ability to gather information via technical means, most significant of

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Johannes M. Wolff is completing a M.Sc. with the European Institute at the London School of Economics and Political Science in the United Kingdom.

which were aerial photographs. At the time such information was collected largely by high-altitude aircraft. Increased Soviet proficiency at fighter interception and anti-aircraft missile design was making surveillance risky and therefore interest in using satellites for reconnaissance grew. The United States began to formulate its political and diplomatic strategy concerning outer space on protecting the legality of satellite intelligence gathering. This generated interest in the legality of satellite overflights; concerns that became real after the Soviet Union launched Sputnik, the world's first man-made satellite, in 1957.

Sputnik transformed the dream of space exploration into reality. Four years later, Yuri Gagarin was the first human to see Earth from space. The launch of Sputnik marked the beginning of space exploration and with it the start of the debate surrounding the militarization of outer space.

As work on space boosters progressed in the United States and the Soviet Union, more normative aspects of space travel began to be explored. Scholars, politicians and diplomats began to take an interest in the issue of space law—more specifically, what should and should not be permitted in space.

With Gagarin's flight, human beings became space travellers. Less than ten years later, men walked on the Moon. Since then, nine space stations have been built and occupied by astronauts from different countries and the International Space Station—a sixteen-nation joint endeavour—is currently under construction. Manned space vehicles, such as the Space Shuttle and the Russian Soyuz, now fly regularly between Earth and low Earth orbit.

Besides exploration and scientific research, space is mainly used for the perspective it provides. This is done with the help of satellites. The satellite industry is the largest sector of commercial space activities today. Orbiting satellites, for example, facilitate communication between distant points on Earth. However, space has also become an important military tool. Satellites have become the eyes, ears and nerves of today's military forces. This is true to such a degree that if the satellites of a space power were to be destroyed, its military capability would be reduced dramatically.

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Much of the difficulty of regulating activities in space is linked to the issue of dual use. This applies to the technologies that can be used interchangeably for space launch vehicles and for ballistic missiles intended as delivery vehicles for weapons. Even more so, the civilian or military purposes of satellites can be difficult to differentiate. This pertains especially to communication and observation satellites, as well as systems such as the Global Positioning System (GPS), which is used for the guidance of many precision weapons but also for various civilian consumer applications.

## *'Peaceful purposes'*

Initially, the world community—including the space powers—urged that space should be used for peaceful purposes. In January of 1957, even before Sputnik was launched, Ambassador John Lodge expressed on behalf of the United States the hope that 'future developments in outer space would be devoted exclusively to peaceful and scientific purposes'.[2] In his address to the United Nations General Assembly he even went so far as to suggest that the testing of satellites and missiles be placed under international supervision (much as was the case with nuclear technology and the Baruch Plan a decade earlier).

Further moves to ensure that 'outer space be used exclusively for peaceful and scientific purposes and for the benefit of mankind'[3] included the joint submission by four Western powers (Canada, France, the United Kingdom and the United States) to the United Nations Disarmament Commission,

calling for a study on an inspection system that would assure that objects launched into outer space would be used exclusively for peaceful and scientific purposes. Adopted by the General Assembly, this became the first United Nations resolution on outer space, and the first time the phrase 'exclusively for peaceful purposes' would be used in an authoritative United Nations text.[4]

The thirteenth session of the General Assembly, held in 1958, provided a forum for the debate on 'Questions of the Peaceful Use of Outer Space'. During this session the term 'peaceful' was used as an antonym to 'military'. Sweden appealed to fellow Member States to 'safeguard outer space against any military use whatsoever'[5] and the Soviet Union put forward a proposal to ban the use of outer space for military purposes. The General Assembly adopted resolution 1348 (XIII), which recognized the 'common aim' of humankind that outer space 'should be used for peaceful purposes only.'[6]

Resolution 1348 established the Ad Hoc Committee on the Peaceful Uses of Outer Space (COPUOS). Its legal subcommittee issued a report in 1959 stating that the United Nations Charter and the Statute of the International Court of Justice were not limited to the confines of the Earth, and that the countries of the world have established a practice, in principle, that 'outer space is, on conditions of equality, freely available for exploration and use by all in accordance with existing or future international law or agreements'.[7]

The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, (The Outer Space Treaty or OST) was concluded in the first years of space exploration, after Yuri Gagarin's historic flight and before Neil Armstrong's walk on the Moon. The OST, which entered into force in 1967, prohibits the testing of weapons, the stationing of weapons of mass destruction (including nuclear weapons), the holding of military manoeuvres, or the establishment of military bases in space.

However, the OST does not cover the transit of nuclear weapons *through* space or nuclear weapons launched from Earth into space in order to destroy incoming missiles (such as some of the American or Soviet missile defence systems originally permitted under the 1972 Anti-Ballistic Missile Treaty). Nor does the OST address other weapons (such as anti-satellite weapons or ASAT) or the placement of conventional weapons in space.

The existing legal structure concerning outer space has a number of additional elements. The Partial Test-Ban Treaty entered into force in 1963 and prohibits nuclear tests and explosions in the atmosphere or in outer space. The Astronaut Rescue Agreement was reached in 1968. The Convention on Registration of Objects Launched into Outer Space entered into force in 1976, which complemented the 1972 Convention on International Liability for Damage Caused by Space Objects. In December 1979, the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies was signed and entered into force five years later.[8]

A second body dealing with outer space issues, the Ad Hoc Committee on the Prevention of an Arms Race in Outer Space (PAROS), was established by the Conference of Disarmament (CD) in 1985. Today PAROS is one of the main obstacles to consensus on the CD's programme of work.

## *The ambiguity of 'peaceful uses'*

When considering the early agreements and statements on outer space, one might have the impression that there has been accord on the peaceful use of outer space. Yet despite their claims that space should be reserved for peaceful uses, the United States and the Soviet Union were developing (and later launching) satellites that would serve a growing number of military objectives. As early as 1955, the United States Air Force contracted the development of reconnaissance satellites, an indication

that early space programmes were more driven by military considerations and requirements than civil or scientific ones.[9]

The seeming contradiction over peaceful use emerges from the fact that the relevant agreements never precisely defined 'peaceful' and 'outer space'. With ambiguous definitions subject to various interpretations, certain activities that one would not normally consider peaceful have been pursued.

For some nations the term 'peaceful' has been interpreted as 'non-aggressive' rather than 'non-military',[10] meaning that all military uses were and are allowed and lawful as long as they remain 'non-aggressive' as permitted under Article 2 (4) of the United Nations Charter, which basically prohibits 'the threat or use of force'.[11] The OST allows for 'passive military' use of space, for example through reconnaissance, surveillance, early warning or communication satellites.[12] The OST also permits military personnel to conduct scientific research in space.

Article 51 of the United Nations Charter, which relates to the right of self-defence, can be invoked in outer space. One might argue that using outer space for deterrent and defensive purposes serves the cause of peace and that only when it is used for offensive activities that it goes against the idea of peaceful use.[13] However, the distinctions between 'offensive and defensive actions, active and passive weapons, and aggression and self-defence becomes more and more blurred.'[14]

The lack of a clear definition was recognized as a potential problem at an early stage. In 1967, after expressing his satisfaction concerning the adoption of the OST, the then United Nations Secretary-General stated that 'the door is not yet barred against military activities in space. The crux of the difficulty is that space activity is already part of the arms race, a fact which we have to reckon with until humanity reaches the stage of an agreement on full and complete disarmament'.[15]

Other arms control treaties have successfully defined the term peaceful. It appears, for example, in the Treaty for the Prohibition of Nuclear Weapons in Latin America (Treaty of Tlatelolco) and in the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (Biological Weapons Convention).

The Antarctic Treaty of 1959 is considered as the most authoritative aid in the interpretation of the term 'peaceful'. It declares, 'Antarctica shall be used for peaceful purposes only. There shall be prohibited, inter alia, any measures of a military nature, such as the establishment of military bases and fortifications, the carrying out of military manoeuvres, as well as the testing of any type of weapons.' This document has been key in the non-militarization of Antarctica.

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Although we continue to speak about the peaceful uses of outer space, it has become a question of rhetoric rather than reality. The current international space regime cannot be viewed as peaceful in a strict sense, as activities related to defensive weapons and support of military functions are carried out in outer space. The militarization of space, and the military reliance on space-based intelligence, surveillance and navigation assets, is well established and continues to grow. It is impossible to turn back time in order to preserve space for truly peaceful purposes, yet it may not be too late to prohibit space weaponization and regulate space activities to prevent offensive and defensive activities and deployments.[16]

## *Boundary of space*

When attempting to differentiate between permitted and prohibited activities in outer space, it is essential to have an operational definition of the boundary between airspace (where certain activities

are allowed) and outer space (where comparable activities are banned, restricted or otherwise regulated). Similar to the question of defining peaceful uses, the demarcation of airspace from outer space has been left to several interpretations.

In practical terms, below an altitude of approximately 69 miles (about 110km), sustained orbit is practically impossible. Above an altitude of approximately 53–62 miles (about 85–100km) aerodynamic lift is largely non-existent. However, there are aircrafts that have flown higher than 62 miles and there are satellites and other spacecrafts that pass through orbits lower than 69 miles.

While stating that outer space should be used exclusively for peaceful purposes, the OST fails to define the boundaries of the area to be kept free from military uses (the boundary between the airspace and outer space). The OST could have made a very useful contribution to the definition question had it been consistent in its use of the term 'outer space'. The treaty sometimes speaks of outer space without any addition and in other instances of outer space as including the Moon and other celestial bodies.[17] Other fora have not had greater success. Notwithstanding the fact that the definition problem has been on the agenda of COPOUS and its Legal and Scientific and Technical Subcommittees since 1959, there have been no concrete results in regards to the demarcation of outer space. It has also been a subject of considerable debate among experts on international law and on space law, yet no consensus has emerged.

Weapons can be categorized according to deployment mode and with respect to their targets. There are weapons that can be based in space, in the air or on the ground. Similarly, these weapons can be aimed at targets in space, in the air or on the ground. For any future discussions on outer space activities, it will be essential to delimit airspace (where use of certain weapons would still be allowed) from outer space (where use of some weapons would not be). An agreed definition would eliminate the significant 'grey area' that has permitted the militarization of space and might one day permit its weaponization.

### *The utility of outer space*

During the first thirty years of the space age, the main military use of space was that of communication and reconnaissance. Many experts agree that this had a stabilizing and beneficial effect on world affairs. However, there have been efforts to acquire techniques for denying enemies the ability to use space in this fashion. The United States developed projects in the late 1950s and both the United States and the Soviet Union worked on ways of dominating space throughout the 1960s and 1970s. It was not until the 1980s however, that serious prospects for more active military uses of outer space began.[18]

Yet at the same time, civil uses of space have exploded. With an estimated US$77 billion in revenues and more than 800,000 people employed worldwide in 1996, the global space industry is one of the world's vital economic engines. Civilian space activities fuel some of the most important high-tech economic sectors: software and hardware development, sophisticated electronics, telecommunications, and advanced materials research. Furthermore, satellites have become essential to communications, navigation, broadcast, meteorology, and numerous other fields essential to our daily lives. This has therefore become one of the arguments put forward for the weaponization of outer space as these civilian assets are 'unprotected' and an attack on them could have very serious consequences on a technology-dependent state.

In theory, outer space could be exploited militarily in the same way that land, sea and air are. It could be utilized as a base for attacking an enemy, as a source of materials, as a vantage point for

observation (the 'high ground'), and as a means of rapid movement. Current military uses of space mainly involve the use of three types of satellites: observation, communications and early warning satellites. Observation satellites are capable of generating high-resolution images, monitoring communications, and producing information concerning navigation, weather, targeting adjustments, troop movement, etc. Communications satellites allow military commanders to exercise control over distant forces and to receive real-time information about the progress of a campaign or about possible enemy actions to a degree that was previously unknown. Early warning satellites can monitor enemy territory for military activity, such as missile launches, thereby providing additional crucial minutes of response time.

## *ASAT and missile defence*

Until now, satellites and their various uses have been known as 'force multiplier' applications. This means that their military role is one of amplifying the effect of other, more conventional forces, rather than to take action on their own. Satellites capable of attacking targets on the ground are still fantasy, although eventually they could revolutionize land warfare. However, ASAT weapons, and weapons capable of intercepting ICBMs during the space flight phase of their trajectory (i.e. ballistic missile defence or BMD) are the main weapons of concern when considering the future of outer space, as they are currently under development and will further reduce the chances of avoiding the weaponization of space.

With the development of weapon systems for attacking satellites, the dangers of warfare have been extended into outer space. An ASAT system may be based on Earth or else carried by a satellite. Ground-based ASAT weapons are of two types—missiles or high-energy laser weapons. Space-based ASAT systems concepts involve the use of satellites as weapons, conventional explosives or lasers carried on board satellites, and charged particle beam weapons. The question of ASATs is particularly difficult due to the dual-use factor. '[A]ny country with a ballistic missile capability essentially has both a space-launch and an ASAT capability as well. The technology is basically the same.'[19]

***Concern over the militarization of outer space is largely emerging as a response to current American plans for ballistic missile defence.***

Concern over the militarization of outer space is largely emerging as a response to current American plans for ballistic missile defence. Precedents for such concerns had arisen—and waned—with the Strategic Defence Initiative (SDI) envisaged by the United States in the 1980s, which was scaled down in the 1990s with such projects as GPALS (Global Protection Against Limited Strikes). In 1997 the United States Space Command published *Vision for 2020*[20] which laid out such concepts as 'the ability to dominate space' and 'the application of precision force from, to, and through space'.

At the time the Clinton Administration and armed forces said that the ideas explored in *Vision for 2020* were only part of a future-looking exercise. However, in 2000 President Bush asked Donald H. Rumsfeld to chair a commission to develop plans for America's activities in space. In January of 2001 the Commission to Assess United States National Security Space Management and Organization (known as the Space Commission) issued a report that went much further than *Vision 2020* in terms of scope and policy relevance.[21] Recommendations from that report are currently being implemented. The United States has committed to building a missile defence system that will protect the United States against limited ballistic missile threats, including accidental or unauthorized launches or rogue threats.

The United States Missile Defense Agency's plans and deployment activities hinge on the notion of an 'evolutionary' missile defence system—no longer dubbed 'national' in order to convey the

intention to provide protection for allies or friends rather than just for the United States territory. The overall architecture of this system is not preordained. Instead, following the deployment of initial elements in 2004–2005, it will 'evolve' as the testing and performance of various technologies proceeds. Whether such an evolutionary system involves elements of space weaponization is thus not certain, but neither is it in any way foreclosed.

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According to these American policy documents and others, military space capabilities are to become the foundation for its national security and military strategies. The declared objective of the United States is complete space superiority.

A BMD system is based on target-detection, recognition, tracking and destruction systems. In the past these tasks have mostly been performed by ground-based radar sensors and by target interceptors armed with nuclear warheads. As such systems have numerous vulnerabilities, the United States perceives the need to further develop its BMD systems, thereby reducing a part of their vulnerability by placing them 'out of reach'. However, it should not be forgotten that space surveillance and spacecraft command and control systems, ground receiving stations and space surveillance networks have sensitive ground-based components and are vulnerable to attack.[22]

Since the withdrawal of the United States from the ABM Treaty in 2002, 'there is no longer a treaty prohibition against testing or deploying weapons in space other than weapons of mass destruction.'[23] However, there are elements of the missile defence plans of the United States, such as space-based interceptors, that would necessitate the withdrawal from or modification of international treaties before their deployment. Its withdrawal from the ABM Treaty in 2002 was a clear signal of America's commitment to moving ahead with space-based weapon options by removing obstacles in its path.

Different conceptions of BMD have different implications for space militarization and weaponization. Existing American, Russian or Israeli systems (the Arrow 2) involve space-based elements for communication and detection, but no actual weapons in space. Some ground- or air-based interceptors (whether kinetic-kill vehicles or lasers, for example), however, have ASAT capabilities, and future interceptors based in space would constitute a clear weaponization of outer space. But existing international law does not prevent the development of two types of space-based weapons: kinetic-energy weapons (KEW) and directed energy weapons (DEW). KEW 'kill' by hitting another object at a very high speed, and to increase their effectiveness, they may also include chemical explosives. DEW focuses energy beams at the speed of light to destroy a target.[24]

The close connection between missile defences and outer space is therefore a complex challenge for arms control in the absence of any international legislation governing non-nuclear weapons in space.

## *Arms control responses*

The development and testing of new technologies is leading the United States towards the space weaponization threshold. The development and proliferation of new technologies applicable to ASAT and BMD systems and of new states with missile capabilities create a temptation to forge an arms control regime based on broad generic definitions and technical demarcation, on the presumption that the broader the terms of restriction, the better it will cope with the variety of technologies and the differing levels of technical capacity among various programmes.

It is probable that those opposed to the weaponization of space will argue for an ASAT ban as the most urgent step.[25] However, 'there is a strong relationship between ASAT and BMD technologies and the technical, political and diplomatic action taken in one sphere will almost certainly affect the other'.[26] The pursuit of missile defence by the United States further complicates the issue of differentiating between the testing and deployment of ASAT and BMD. Because of this linkage and the single-minded pursuit of missile defence by the United States, some fear that an ASAT ban is now out of reach, and the question of weapons in space requires to be addressed in a comprehensive manner,[27] as it is easier to exclude armaments than to eliminate or control them once they have been introduced.[28]

***The pursuit of missile defence by the United States further complicates the issue of differentiating between the testing and deployment of ASAT and BMD.***

## *Conclusion*

Despite lofty commitments, the world failed to maintain outer space for peaceful purposes. Militarization of outer space has been a *fait accompli* since the beginning of the space exploration age. Until now space objects have only acted as force multipliers, however we are approaching the threshold of space weaponization. We have managed to transcend the heavens, a task long seen as impossible, yet we have done little to prevent the militarization of space. We have the opportunity and responsibility to prevent its weaponization.

### Notes

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