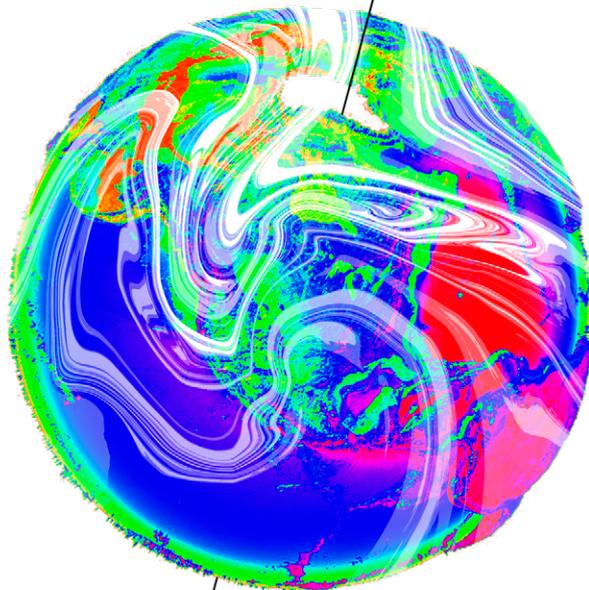




Security Council

Expert's report



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Prevention of an arms
race in outer space.

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Introduction

The emergence of active models of space weapons in the Earth's orbit can seriously undermine the foundations of the world-wide system of maintaining peace and security — and actually bring humanity back to the state of 'Cold war'. If the countries begin to deploy weapons in outer space, this will seriously violate military-strategic equality, creating the possibility of an unpunished first strike. Such weapons are destabilizing in their nature.

This contour can provoke a conflict between the countries that possess space weapons and the ones which do not. This conflict can be both hidden and open, which may aggravate interstate relations and even lead to armed conflicts. In addition, in this case it should be noted that the results of the possible impact of space weapons on the Earth's biosphere can entail devastating consequences for all mankind¹.

Firstly, the creation of space weapon systems is closely connected with the creation of numerous orbital constellations of satellites or space stations on a near-earth orbit, which might create serious problems for further studying and exploration of space. Secondly, it is related to the problem of space debris, the amount of which might drastically increase in case of creation of space weapons and further complicate existing space navigation.

¹ U. S. Department of Defense, «Nuclear Weapon Effects in Space»: <https://history.nasa.gov/conghand/nuclear.htm> Accessed: October 22, 2017.

I. Historical Analysis of the Development of Technology for the Creation of Space Weapons

1) The project created by the United States Orbital Flotilla «Deep Space Bombardment Force» (1958-1962) and the concept of the nuclear-impulse ship Orion.

During the period from August 1958 to November 1962, the United States conducted nine nuclear tests in space. The purpose of the tests was to investigate the possibilities of using space nuclear explosions to destroy enemy ballistic missiles or, in other words, for the purpose of anti-missile defense. The first operation, called «Argus»², was held in 1958; it included the explosion of three warheads of low power, that is, no more than one kiloton. They were blown up at altitudes from 200 to 900 km over the southern part of the Atlantic Ocean. The second operation, called «Aquarium»³, was held in 1962 over the island of Johnston in the southern part of the Pacific Ocean. In this test, more powerful charges up to 1.5 megatons were used. One of these tests, conducted on October 26, 1962, was timed to coincide with the apogee of the Caribbean crisis. As a result of the explosions, significant twists of the Earth's magnetic fields were detected, civilian lines of radio and television communications were disrupted, as well as some military satellites and one power line in the Hawaiian Islands.

The Soviet Union, in turn, conducted four tests in space and one test in the upper atmosphere between October 1961 and November 1962. As in the case of the United States of America, the purpose of the bombings was missile defense.

² Sublette, Carey, *Nuclear Weapons Archive*: <http://www.nuclearweaponarchive.org/Usa/Tests/Accessed: October 15, 2017>

³ Naval Historical Center, «*Dictionary of American Naval Aviation Squadrons*» – Volume 2. p. 157, 190.

Because of the great damage caused by these nuclear tests, in 1963 the United States of America, Great Britain and the USSR signed a treaty banning tests in three environments: the atmosphere, outer space and under water. The information about this treaty has already been provided above.

2) The Strategic Defense Initiative of 1983, which is the element of American missile defense in orbit, deployment of various weapons systems, the achievement of dominance in space.

This initiative is sometimes called the «Star Wars project»⁴, as the plans to conquer outer space looked too incredible. The ultimate goal was to achieve dominance in space and to create an anti-missile “shield” in order to protect the entire territory of North America. Americans wanted to accomplish this task by deploying several echelons of shock space weapons capable of intercepting and destroying ballistic missiles and their combat blocs in all sectors of the flight. The initiative did not deny the implementation of active defensive actions up to attack.

3) Theoretical aspects of the creation of combat space stations. There are some very important unsolvable problems, which include:

- large mass of stations;
- difficulty of assembling in open space;
- lack of energy;
- the problem of the space-based nuclear reactors.

4) The projects of the reconnaissance satellites “Almaz” (the Soviet Union) and

⁴ William Broad, “‘STAR WARS’ Traced to Eisenhower Era”: <http://www.nytimes.com/1986/10/28/science/star-wars-traced-to-eisenhower-era.html>. *The New York Times*. Accessed: October 22, 2017.

«MOL — Manned Orbiting Laboratory»⁵ (the United States of America) in the 1970s. Reconnaissance satellites and communications satellites are the main military use of outer space.

Due to the lack of funding, the U.S. government was forced to stop the MOL project. However, the empty fuel tank, which would later become a part of the station, was put into orbit and did not return back. In order to keep up with their main competitors in space, the Soviet engineers urgently started the development of the Almaz station. It was supposed to solve the problems of scientific, defense and economic significance.

In 1982, the United States of America started actively testing anti-missile systems. In 1988, despite some proved success, the program was closed.

5) Anti-satellite weapons.

The Soviet Union conducted the tests of interceptor missiles. However, the project was also closed due to debris pollution.

On January 11, 2007, China conducted a successful test of its own anti-satellite weapon: a meteorological satellite in the polar orbit at an altitude of 865 km was shot down by a direct hit of an anti-satellite missile. As a result of the destruction of the satellite, a cloud of space debris was formed.

6) Separate armaments as an aspect of the use of beam and laser weapons.

The beam weapon is a kind of space weapon based on the formation of a particle beam (electrons, protons, ions or neutral atoms) accelerated to relativistic (near-light) velocities, and using the kinetic energy stored in them to destroy enemy objects. It was developed as part of a strategic defense initiative in the United States of America.

⁵ Department of Defence, "Air Force to Develop Manned Orbiting Laboratory": <http://www.nro.gov/foia/declass/mol/6.pdf>. Accessed: October 22, 2017.

Beam weapon has three factors of destruction: mechanical destruction, directed X-ray and gamma radiation and electromagnetic impulse. This type of weapon may be used for the destruction of ballistic missiles, space and combined aerospace vehicles. The advantage of beam weapon is its high speed. Among the disadvantages, such factor as the loss of kinetic energy of elementary particles should be regarded.

Laser weapons are designed to combat the missiles of various bases and destinations, aircraft and protect their nuclear-powered aircraft from guided enemy missiles. The development of this type of weapons has been fostered for several decades. One of the largest players in this field is the United States of America. They are developing a weapon model capable of destroying the living force, which is a breakthrough for the weapons of this magnitude. Companies also develop anti-missile and even anti-satellite lasers. Israel is actively engaged in the process, as it developed a chemical laser capable of hitting an artillery shell in flight. Neither does South Korea lag behind in the race for nuclear weapons technologies. The main goal of this country is to disable the artillery systems of the DPRK and China. Interest in the study of laser weapons is also expressed by China and Russia. The advantages of laser weapons include: the stealth of application (no flame, smoke, sound), high accuracy, almost instantaneous action. The disadvantage is its greater dependence⁶ on weather conditions.

⁶ David Vergun Army News Service «Laser Weapons Bring Sharp Advantages to the Battlefield»: <https://www.defense.gov/News/Article/Article/1229046/laser-weapons-bring-sharp-advantages-to-the-battlefield/>

Accessed: October 22, 2017

KEY TERMS AND MAIN ORGANISATIONS

Air-to-surface missile (ASM) is a missile designed to be launched from military aircraft at targets on land or sea.

Anti-ballistic missile (ABM) is a surface-to-air missile designed to counter ballistic missiles.

Anti-satellite weapons (ASAT) are space weapons designed to incapacitate or destroy satellites for strategic military purposes.

Celestial object is a naturally occurring physical body, association, or structure that exists in the observable universe. In astronomy, the terms “object” and “body” are often used interchangeably.

The Committee on the Peaceful Uses of Outer Space (COPUOS) was set up by the General Assembly in 1959 to govern the exploration and use of space for the benefit of the whole humanity: for peace, security and development. The Committee was tasked with reviewing international cooperation in peaceful uses of outer space, studying space-related activities that could be undertaken by the United Nations, encouraging space research programmes, and studying legal problems arising from the exploration of outer space.

Missile is a self-propelled precision-guided munition system, as opposed to an unguided self-propelled munition, referred to as a rocket. Missiles come in types adapted for different purposes: surface-to-surface and air-to-surface missiles (ballistic, cruise, anti-ship, anti-tank, etc.), surface-to-air missiles (and antiballistic), air-to-air missiles, and anti-satellite weapons.

Outer space is the void that exists between celestial bodies, including Earth.

Satellite is an artificial object which has been intentionally placed into orbit.

Surface-to-surface missile (SSM) is a missile designed to be launched from the ground or the sea and strike targets on land or at sea.

The United Nations Office for Outer Space Affairs (UNOOSA) works to promote international cooperation in the peaceful use and exploration of space, and in the field of utilization of space science and technology for sustainable economic and social development.

Weapon of mass destruction (WMD) is a nuclear, radiological, chemical, biological or other weapon that can kill and bring significant harm to a large number of humans or cause great damage to human-made structures (e.g., buildings), natural structures (e.g., mountains), or the biosphere.

II. Development of legal instruments to prevent the arms race in outer space, its demilitarization and existing legal acts in this area

When the Soviet Union put the first artificial earth satellite to orbit in 1957, it launched the epochal space race of superpowers. However, at the same time, the international community realized that in order to develop space peacefully and safely, states should acquire legal instruments with help of which it could be possible to establish proper legal regime for outer space and celestial bodies.

These are the main steps of the United Nations aimed at solving this problem:

A) 1958: the establishment of the Committee on the Peaceful Uses of Outer Space (COPUOS) and the design of its structure (UNGA Resolution No.1472)⁸.

Its original membership consisted of the following countries: Australia, Austria, Albania, Argentina, Belgium, Bulgaria, Brazil, Canada, Chile, China, Colombia, Ecuador, France, Germany, Italy, Lebanon, Mexico, Poland, Romania, United Kingdom of Great Britain and Northern Ireland, The United States of America, the Union of Soviet Socialist Republics, France, Czechoslovakia, Sweden and Japan.

The duties of the committee include the promotion of space exploration, mutual information exchange of data on these studies, and elimination of problems that may arise during the study of outer space.

B) 1963: UNGA Resolution No. 1884 (A/RES/18/1884) — «Question of general

⁷ Anatoly Zak, "Sputnik's mission": www.russianspaceweb.com/sputnik_mission.html. RussianSpaceWeb.com. Accessed: October 22, 2017.

⁸ UNGA Resolution No. 1472 http://www.unoosa.org/pdf/gares/ARES_14_1472E.pdf Accessed: October 22, 2017

and complete disarmament»⁹.

Since the intentions of the United Nations on the peaceful use of outer space did not find wide support among the states, in 1963 the United States of America and the USSR expressed their intention not to station any objects carrying nuclear weapons or other kinds of weapons of mass destruction in outer space. The General Assembly supported this proposal and called upon all states to refrain from placing weapons of mass destruction in outer space.

This decision of the General Assembly plays a crucial role in the issue of the arms race.

C) 1963: Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water¹⁰.

The initial parties to the treaty were the governments of the USSR, the United Kingdom of Great Britain and Northern Ireland and the United States of America. They were the states which determined the purpose of this agreement, with this consensus being the earliest example of reaching an agreement on general and complete disarmament. Universal obedience to this goal¹¹ would finally put an end to the arms race and eliminate production and testing of nuclear weapons. Experts consider these tests and the use of weapons of mass destruction harmful to humanity and to the environment.

According to this agreement, each party is obliged to prohibit and prevent test

⁹ A/RES/18/1884 - «Question of general and complete disarmament» <http://www.un-documents.net/a18r1884.htm>. Accessed: October 22, 2017

¹⁰ Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water (1963) https://en.wikisource.org/wiki/Partial_Test_Ban_Treaty Accessed: October 22, 2017

¹¹ Atomic Heritage Foundation, «Partial Test Ban Treaty»: <http://www.atomicheritage.org/history/limited-or-partialtest-ban-treaty-tbtptbt> Accessed: October 22, 2017

explosions of weapons in the atmosphere (including outer space) and under water.

Moreover, this is the first source of binding norms of international law in this field. At the moment¹² it was signed by 131 states¹³; among the non-aligned ones are China, France and North Korea.

D) 1966: Treaty on Principles Governing the Activities of States in the

Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty)¹⁴.

This agreement provides a basic list of principles of international space law.

Article 1 of the Treaty establishes the provision that outer space shall be the province of all mankind. Article 2 of the Treaty prohibits national appropriation of any areas of space, does not allow the establishment of the sovereignty of any state over the heavenly bodies. Article 4 establishes the principle according to which the member states of the Treaty undertake not to place any objects carrying nuclear weapons or any other kinds of weapons of mass destruction into earth orbit, or install such weapons on celestial bodies or station weapons in outer space.

Together with the Treaty of 1963, the Outer Space Treaty provides a legal regime for a nuclear-free zone around the Earth, namely introduces ban on deploying military bases on celestial bodies, testing any weapons

¹² As of October 22, 2017.

¹³ UN Office for Disarmament Affairs, «Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water»: http://disarmament.un.org/treaties/t/test_ban Accessed: October 22, 2017

¹⁴ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1966) http://www.unoosa.org/pdf/gares/ARES_21_2222E.pdf Accessed: October 22, 2017

and conducting military maneuvers.

Article 9 of the Outer Space Treaty of 1966 establishes the following important provision: «If a State Party to the Treaty has reason to believe that an activity or experiment planned by another State Party in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, may request consultation concerning such activities or experiments». It is also important to note that the Parties shall have the possibility to request the right to have a launching State to observe space objects launched.

E) 1972 — Treaty between the United States of America and the USSR on the Limitation of Anti-Ballistic Missile Systems¹⁵.

In this agreement, the states declared their intention to stop the arms race and to take effective measures towards achieving complete nuclear disarmament. They expressed their desire to contribute to the relaxation of international tension in order to strengthen trust between the states.

Both the United States of America and the Soviet Union undertake not to create an anti-missile defense system both on their territory and on the territory of other states.

The agreement also specifies the components of the anti-ballistic missile defense system that are in combat composition, under construction, testing and repair, and those that are temporarily suspended.

However, each of the states parties to the treaty may have no more than 15 ABM systems at the test sites in aggregate.

¹⁵ Treaty between the United States of America and the USSR on the Limitation of Anti-Ballistic Missile Systems (1972) <https://treaties.un.org/doc/Publication/UNTS/Volume%20944/volume-944-I-13446-English.pdf>

Accessed: October 22, 2017

Not only is this legal act important for limiting the race of strategic offensive and defensive weapons, but it also addresses the emergence of shock space weapons and the militarization of outer space. However, on June 13, 2012, the United States of America denounced the Treaty.

F) 1977: The Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Facilities¹⁶.

According to this Convention, it is prohibited to use means of influence in outer space, as well as from outer space, on the Earth's natural environment for military or any other hostile purposes, which may have broad, long-term and serious consequences, as ways to destroy, damage or cause harm to any other State Party. The term "environmental impact" used in Article 1 should be understood as any attempt to deliberately control natural processes — the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere, atmosphere and outer space.

G) 1979: Agreement Governing the Activities of States on the Moon and Other Celestial Bodies¹⁷.

This treaty specified the provisions of the Outer Space Treaty of 1966 in relation to the Moon and the celestial bodies of the Solar System.

Article 3 of the Treaty introduces a ban on the placement of weapons of mass destruction, military bases, the admission of tests of any weapons and military maneuvers on the Moon.

¹⁶ *The Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Facilities (1977)* <http://www.un-documents.net/enmod.htm> Accessed: October 22, 2017

¹⁷ *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1979)* http://www.unoosa.org/pdf/gares/ARES_34_68E.pdf Accessed: October 22, 2017

The Treaty also fixes the provision under which a state party to the treaty is obliged to notify the UN Secretary-General of the placement of radioactive materials on the surface of the Moon and the purposes of such deployment.

Thus, all activities related to the use of outer space for military purposes in accordance with the existing norms of international law can be divided into three categories.

1. The category of permitted activities includes:

- The use of observation satellites and space-based remote sensing devices to monitor compliance with contracts and agreements in the field of arms control;
- Use of space communication, navigation, mapping and meteorological support for military use;
- Use of military personnel for scientific research for peaceful purposes.

2. The category of prohibited activities in space includes:

- Placement of nuclear weapons and other weapons of mass destruction in orbits around the Earth, on celestial bodies and orbits around such bodies;
- Testing of nuclear weapons in outer space;
- The deployment of military bases and military trials and maneuvers on celestial bodies and orbits around them;
- Military or hostile use of means of influence on natural environment from outer space.

3. The category of activities not regulated by international law in space includes:

- Creation, testing and deployment of anti-satellite weapons;
- Development, testing and deployment of anti-ballistic missile defense systems, space-based systems or their components;
- Conducting military-applied experiments in space;

- Creation and deployment in space of means of optical and electronic suppression of space, air and ground-based technical means;
- Creation and deployment in space of weapons based on new physical principles, which cannot be attributed to weapons of mass destruction, and aimed at destroying objects in space, in the Earth's atmosphere and on its surface.

Nevertheless, the listed agreements have not resolved the emerging issues.

- 1) Who will control the non-proliferation of space weapons? How will these measures of control be achieved?
- 2) How should such objects be registered?
- 3) What is the responsibility of states for placing weapons of mass destruction and defeat in outer space?

The main issue, however, is that despite all the measures undertaken so far, there is no definitive ban on the use of space weapons. In fact, only the use and testing of nuclear weapons in space is prohibited.

III. Perspectives of prevention of an arms race in space

Since the issue is becoming more and more urgent, measures to resolve it should be taken as soon as possible. In October 2004, the Russian Federation unilaterally assumed the obligation not to use space weapons first. This decision can mean that the country is ready to make concessions to prevent an arms race in space.

In 2005, a similar statement was made by member states of the Collective Security Treaty Organization, namely Armenia, Belarus, Kazakhstan, Kyrgyzstan, Tajikistan and Russia.

The Russian Federation and the People's Republic of China are developing "Transparency and Confidence" measures against which the United States of America votes annually. The measures are supposed to significantly reduce the likelihood of military threats in space and from outer space.

In 2008, the draft treaty on the prevention of the deployment of weapons in outer space was provided.

In accordance with Article 1, precise definitions of the terms "outer space", "space object", "weapons in outer space", "placement of weapons in outer space" and "use of force" are introduced.

Article 2 fixes the provision that the states participating in the Treaty undertake not to use or place weapons in outer space. The treaty also stipulates that in case the states fail to reach consensus, two variants are possible: no report would be issued, or a report that provides no recommendations but instead outlines competing views will be forwarded¹⁸.

The authorship of this treaty belongs to the Russian Federation and the People's Republic of China. The United States of America

expressed its disagreement with this treaty.

It is easy to see the trend that as soon as a draft that restricts activities in the outer space of a single country is introduced, the United States of America strongly opposes any changes in the space order.

In 2008, the European Union proposed the Code of Conduct for Outer Space. The difference is that it does not touch upon armament issues, but deals with other aspects of safe use of outer space, the issue of space debris in particular.

The signatory countries should "refrain from any actions aimed at causing damage or destroying space objects, except when such action is carried out to reduce the generation of space debris and/or justified by the realization of the inalienable right to individual or collective self-defense in accordance with the UN Charter".

The Code of Conduct in Outer Space and the Treaty on the Prevention of the Placement of Weapons in Outer Space regulate various aspects of the activities of states in outer space, so that their separate acceptance is permissible (Russian Federation, United States of America). At the same time, the United States of America refused to consider the first draft of the Code of Conduct due to excessively harsh conditions that would hamper the development of the U.S. space program.

Moreover, the adoption of the Code of Conduct is inexpedient without the prior adoption of the Treaty on the Prevention of the Placement of Weapons in Outer Space.

The draft does not determine its exact place in the system of international instruments for providing the safety of space activities.

¹⁸ <https://fas.org/pubs/pir/2011winter/2011Winter-Transparency.pdf> Accessed: October 22, 2017

Conclusion

The prevention of an arms race in outer space is a long-term aspect of international space policy, since in reality such weapons do not exist yet.

However, projects are being actively developed, and the states are temporarily constrained by existing space treaties (which do not guarantee security). However, there are more and more countries that are creating all new types of weapons in order to fight not only on Earth, but also in outer space.

Annex

UN KEY DOCUMENTS

1. UNGA Resolution No. 1472 http://www.unoosa.org/pdf/gares/ARES_14_1472E.pdf Accessed: October 22, 2017
2. A/RES/18/1884 - «Question of general and complete disarmament» <http://www.undocuments.net/a18r1884.htm>. Accessed: October 22, 2017
3. Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water (1963) https://en.wikisource.org/wiki/Partial_Test_Ban_Treaty Accessed: October 22, 2017
4. UN Office for Disarmament Affairs, «Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water»: http://disarmament.un.org/treaties/test_ban Accessed: October 22, 2017
5. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1966) http://www.unoosa.org/pdf/gares/ARES_21_2222E.pdf Accessed: October 22, 2017
6. Treaty between the United States of America and the USSR on the Limitation of Anti-Ballistic Missile Systems (1972) <https://treaties.un.org/doc/Publication/UNTS/Volume%20944/volume-944-I-13446-English.pdf> Accessed: October 22, 2017
7. The Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Facilities (1977) <http://www.un-documents.net/enmod.htm> Accessed: October 22, 2017
8. Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1979) http://www.unoosa.org/pdf/gares/ARES_34_68E.pdf Accessed: October 22, 2017

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1. U. S. Department of Defense, «Nuclear Weapon Effects in Space»: <https://history.nasa.gov/conghand/nuclear.htm> Accessed: October 22, 2017.
2. Sublette, Carey, Nuclear Weapons Archive: <http://www.nuclearweaponarchive.org/Usa/Tests/> Accessed: October 15, 2017
3. Naval Historical Center, «Dictionary of American Naval Aviation Squadrons» – Volume 2. p. 157, 190.
4. William Broad, «'STAR WARS' Traced to Eisenhower Era»: <http://www.nytimes.com/1986/10/28/science/star-wars-traced-to-eisenhower-era.html>. The New York Times. Accessed: October 22, 2017.
5. Department of Defence, «Air Force to Develop Manned Orbiting Laboratory»: <http://www.nro.gov/foia/declclass/mol/6.pdf>. Accessed: October 22, 2017.
6. David Vergun Army News Service «Laser Weapons Bring Sharp Advantages to the Battlefield»: <https://www.defense.gov/News/Article/Article/1229046/laser-weapons-bringsharp-advantages-to-the-battlefield/> Accessed: October 22, 2017
7. Anatoly Zak, «Sputnik's mission»: www.russianspaceweb.com/sputnik_mission.html. RussianSpaceWeb.com. Accessed: October 22, 2017.
8. Atomic Heritage Foundation, «Partial Test Ban Treaty»: <http://www.atomicheritage.org/history/limited-or-partial-test-ban-treaty-ltbtptbt> Accessed: October 22, 2017
9. <https://fas.org/pubs/pir/2011winter/2011Winter-Transparency.pdf> Accessed: October 22, 2017

OTHER USEFUL LINKS

1. UN web-site <http://www.un.org/>
2. SC web-site <http://www.un.org/en/sc/>
3. General Assembly web-site
<http://www.un.org/en/ga/>
4. UNOOSA web-site <http://www.unoosa.org>
5. COPUOS web-site <http://www.unoosa.org/oosa/en/ourwork/copuos/index.html>