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NEW INSIGHTS INTO SPACE ACTIVITIES REGULATION: AB ORIGINE TO CONTEMPORARY

*The research presents new perceptions on the process of regulating space activities based on a synthesis of innovative approaches to regulating such activities and analysis of documents adopted by the international community in this area over the entire period of development of space activities. First of all, the research raises the issue of the format of the existing Space Law (including the form of *Conventionalis stipulatio*) as well as the question of the possibility of the emergence in the future of several new legal systems to regulate space activities. In this regard, the list of subjects and objects of space activities and space law is revised, and options for their classification and new interpretations are proposed. In addition, at this stage of the research, a proposal is presented for applying a new approach to organizing the legal space of the Universe taking into account the principles of “domestic room” and “alien room”. At the same time, this proposal also includes the use of new methods to determine the spatial-territorial jurisdiction of States. Thus, instead of searching for the border between airspace and outer space (which has not yet been successful), the question of the possibility of dividing the entire aerospace into several special layers is considered, namely a layer of spatial security of States, a layer of spatial security of humanity, and open space. Additionally, the research emphasizes the gradual formation in 1958 – 1963 of the first four most important General Principles for Space Activities, which in the future may become the basis for the development of Outer Space Public Law aimed at the benefit of all humanity. According to the author, the findings of this research can be useful to form a new insight into the process of regulating space activities and develop new forms and types of Space Law that will change the international situation in this area for the better.*

Keywords: space, space law, space activities, principles, subjects, objects, jurisdictions

INTRODUCTION

Compared to the 20th century, in the 21st century space activities have shifted to a new technological and political level of development. The orbits of the Earth are massively occupied by artificial satellites of States and private companies, research stations are sent to the Moon and Mars, plans are being made for the exploration of asteroids and the colonization of the Moon and Mars, and outer space is massively saturated with military satellites and weapons. Moreover, on November 07-08, 2023, at the COSMIC Kickoff Meeting, representatives of NASA and the US White House stated the existence of space armed forces, preparation for celestial bodies colonization, and war in outer space and on celestial bodies.

It is possible to say that the era of global space confrontation has begun. If the process of regulating space activities does not move to a new, qualitatively higher level, then such confrontation threatens all mankind with an orbital satellite war, which can develop into a large-scale space war. At the same time, the mentioned war could lead to the destruction of all mankind. There will be no winners in this war, and the loser will be humanity.

In turn, such an unfortunate state of affairs in space law indicates that existing international law has ceased to regulate space activities and is gradually turning into atavism. At the same time, even a superficial glance is enough to understand that today the process of regulating

relations in outer space and on celestial bodies resembles frozen volcanic lava. This lava previously flowed in different directions, bypassing uncomfortable areas, and is now frozen in different places resembling a patchwork and leaky blanket with a lot of patches.

Thus, we can conclude that international law in its present form cannot solve current problems in regulating space activities.

To make a positive difference in Space Law, it is necessary to find new formats and approaches to regulating space activities. First and foremost, it is necessary to reanalyze the process of development of Space Law from its origins to the present.

The **PURPOSE** of the paper is to develop a new vision and understanding of Space Law based on the results of previous research on this topic.

MATERIALS AND METHODS

To date, many scientists, diplomats, and honored lawyers have studied the evolution of the process of regulating space activities, e.g., N.R. Malysheva, V.V. Galunko, O.S. Stelmakh, Marcia S. Smith, B. Cheng, Albert K. Lai, I.A. Csabafi, O.Y. Asamoah, Ogunbanwo O. Ogunsola, Everett C. Dolman, I.H.P. Diederiks-Verschoor, V. Kopal, Jonathan F. Galloway, M.N. Shaw, F. Tronchetti, O.J. Lissitzyn et al.

However, it should be noted that all of them mainly

provide deep analysis only of global international documents on the regulation of space activities, such as international treaties or UN conventions. At the same time, other international documents, such as Resolutions and Declarations adopted by the United Nations General Assembly (the UN GA or the UN General Assembly) were subjected to only superficial analysis concerning their insignificance. In turn, it was precisely this position that led to the emergence of a “patchwork” and “leaky” quilt, which today consists of the so-called Space Law, where most of the processes have remained unsettled or are irresponsibly violated.

In addition, it is necessary to pay attention to the fact that, in general, scientists considered the process of regulation of space law only from the point of view of states or international organizations bypassing the point of view of such participants in space activities as people, non-governmental, and commercial organizations. This has led to the fact that such studies have become one-sided and have missed other important elements of the process of regulation of space activities.

In this regard, during 2021-2023, the authors of the paper conducted the first cycle of studies based on a deep analysis of all international documents in the field of space activities regulation adopted by the international community in 1958 – 1963.

The results of these studies were published in the papers “Regulation of space activities during the 1958-1963 period» [10], “Space Law, Subjects and Jurisdictions: pre-1963 period” [11], «Outer space public law: the 1958-1963 period. Part 1» [8], and «Outer space public law: the 1958-1963 period. Part 2» [9], “Fundamental principles of outer space (cosmic) law development” [13], “The Outer Space (Cosmic) Law Portal” [12].

To obtain the most effective scientific results of the research, general scientific methods (analysis and synthesis, deduction and induction, and system-structural), general philosophical methods (dialectical and hermeneutics), and special methods (historical and legal, formal legal, comparative legal) were applied.

To date, the mentioned research cycle is the first thorough study of all international documents in the field of regulation of space activities adopted by the international community in 1958-1963.

The results of the above studies made it possible to form a new insight into the process of regulating space activities and propose new forms and types of Space Law that will change the international situation in this area for the better.

RESULTS

1. Outer Space Law. General concepts

Any researcher who studies the processes of regulation of space activities understands that Outer Space Law is a unique type of law.

I.e., why it cannot be compared with other types of law, such as maritime or air law because these types of law regulate relations within Earth. In turn, the planet Earth is the natural habitat of a human, where one is born, grows old, and lives, and where all natural environments are interconnected with each other and with a human.

However, the environment for the application of Outer Space Law is the Cosmos: open outer space, celestial bodies, stars, and other natural objects beyond Earth that are not the natural habitat of humans and do not belong to anyone. I.e.,

outer space and celestial bodies are alien environments for a human, where one is only a guest.

In this regard, we should not expect from Outer Space Law the classical form of law due to the exclusivity of the environment concerning which this new law is developed. This also applies to States for which Outer Space Law can be formed both based on international treaties and unilateral obligations of States set out as joint public promises (*Conventionalis stipulatio*), which can be considered Resolutions and Declarations of the General Assembly of the United Nations (the UN General Assembly or UNGA) or other similar official documents [11, p. 575].

Moreover, Outer Space Law would not always rely on hard international acts, and in the future, it may be based on new principles and conditions beyond State agreements, especially in the part that concerns human relations. No one deprives the United Nations of the capacity to develop a unified Outer Space Law for States, but this does not mean that people (in person, or through private companies, or non-governmental organizations) cannot elaborate their agreements on relations in outer space and on celestial bodies outside the United Nations. On the contrary, this means that there may be a large number of such agreements, depending on the number of space communities established on the basis of such agreements.

In turn, given the possibility of creating an unlimited number of different space communities, Outer Space Law may also consist of an infinite number of treaties, declarations, or other documents regulating relations in such communities that can have different subject compositions and be based on different principles and ideologies, which in turn can form different legal systems.

At the same time, already at the initial stage, it can be assumed that these legal systems may be worlds apart from each other.

E.g., there may be legal systems designed for “Animal Rationale” individuals who can understand and voluntarily adhere to equitable principles [11, p. 574]. In this case, such legal systems would not be based on strict coercion to comply with norms of behavior but on voluntary compliance with any general principles, showing how to act correctly (fairly) and incorrectly (unfairly) without responsibility for incorrect actions.

There may also be classical legal systems that assume that all individuals are only “*Animal capax Rationis*”, i.e., they could comply with rules (norms) only under the pressure of fear and responsibility [11, p. 574]. Such legal systems would establish (impose) mandatory compliance with specific rules of behavior (norms) despite doubts about their fairness with the mandatory establishment of responsibility for their violation.

There can be an infinite number of such legal systems. I.e., it follows that Outer Space Law in a global projection may consist of diverse and fundamentally different legal systems. At the same time, some of these systems may already exist, and some may only be developed in the future.

Such diversity can exist until all cosmic communities decide to act based on a single generally accepted document (but only by voluntary agreement) or until they all move to a new level of spiritual relations.

Taking into account the above, as well as given previous studies, **Outer Space Law** can be described as a set of legal systems regulating space activities, implying different legal

ideologies and various subject composition, and also an environment of application that extends to outer space and celestial bodies beyond Earth [11, p. 576].

2. Legal systems of Outer Space Law

Based on previous studies from this cycle, today we can assume the formation over time of at least three legal systems of Space Law: Outer Space Law of Principles (or *Animal rationale ius*), Outer Space Private Law (or Cosmic Private Law), Outer Space Public Law (or Cosmic Public Law) [11, p. 576].

At the same time, taking into account the previously stated legal aspects [11, pp. 574–576], these systems can be described as follows.

2.1. Outer Space Public Law

Outer Space Public Law is a legal system that is a part of the *Corpus juris gentium* but has distinctive features associated with the conditions of its application in a space that is alien to both people and States.

At the same time, as practice has proved, public international law lacks mechanisms to ensure its implementation. I.e., neither the State, the union of states, nor the international community as a whole has a generally recognized executive apparatus capable of legally forcing any State to fulfill its international obligations (except for unlawful force or economic coercion). Moreover, this is impossible in outer space beyond the jurisdiction of all States. Thus, it shall be recognized that in public international law, it is impossible to establish binding rules for all States but only to agree on negotiated obligations.

In this regard, Outer Space Public Law would also consist only of the legal obligations of States (and then only until the relevant States renounce them) and may be described as follows.

Outer Space Public Law (or Cosmic Public Law) is a legal system of permanent obligations assumed by public subjects of space activities (various forms of political-territorial organization of society such as States and similar organizations as well as their unions and associations) regulating the activities of such subjects and the relationships between or among them in *Cosmos*.

At the same time, such obligations of public actors can be of several types, e.g. contractual (mutual) obligations (the fulfillment of which is carried out only if they are fulfilled by all parties to the relevant international treaty), unilateral obligations (*stipulatio*), joint unilateral obligations (*Conventionalis stipulatio*), and others types of obligations.

These obligations, in formal terms, can be assumed by public subjects together with responsibility for the failure to fulfill such obligations or without such responsibility. However, given the absence of a mechanism for holding public subjects and entire nations accountable, such responsibility would be only a formal element of this law.

2.2. Outer Space Private Law

In turn, Outer Space Private Law is a classic type of law, i.e., it is similar to the law that is common in modern society. Its only differences would be the conditions of its application (alien environment) and the conditions of control (civic non-public bodies). Thus, Outer Space Private Law can be described as follows.

Outer Space Private Law (or Cosmic Private Law) is a legal system of permanent norms (rules of behavior) that are

formed, controlled, and enforced by non-public subjects of space activities (organizations and/or individuals unable or unwilling to voluntarily comply with equitable principles) within the society or communities they created, and which regulate the behavior and relationships of such subjects in *Cosmos*.

In a sense, Outer Space Private Law can be compared to the INCOTERMS (enforcement of which is carried out by arbitration courts and Chambers of Commerce and Industry) but only on a larger scale and in a different environment of application.

Accordingly, there is a high probability that the development and control of the implementation of Outer Space Private Law would also be carried out by similar bodies and organizations, e.g., Space Arbitration Courts and Space Chambers.

2.3. Outer Space Law of Principles

The peculiarity of this legal system is that the Outer Space Law of Principles is the exclusive right of individuals, and only they could be its authors (creators). I.e., neither States, private companies, unions of States, nor their representatives could be the authors (creators) of the Outer Space Law of Principles since this right is not and cannot be another element of the *Corpus iuris gentium*.

At the same time, any system of principles of space activities created within the framework of the Outer Space Law of Principles may only be based on voluntary compliance with such principles within a voluntary society (or community) that accepts these principles as a basis or was established based on such principles. I.e., to say, no one can ever force anyone to perform or oblige to comply with any system of permanent principles of space activities within the framework of the Outer Space Law of Principles.

Proponents of classical legal systems may call this system utopian because they do not believe in the ability of people to create equitable principles and voluntarily comply with them. However, this system is a viable option and can be described as follows.

Outer Space Law of Principles (or Animal rationale ius) is a legal system that may consist of one or many systems of permanent principles of space activity formed by individuals within the voluntary society or community they have created and describing fair forms of relationships and behavior of individuals (*Animal rationale*) in *Cosmos*.

At the same time, due to the lack of security for the Outer Space Law of Principles (in the form of enforcement of the principles or establishment of punishment for their non-compliance), control of compliance with the principles of space activity can be carried out either by each individual or by a group of individuals or by the entire society (or community). Such control may also be exercised by permanent or temporary non-public bodies or organizations established within the relevant society (or community) that have the right to make decisions regarding compliance with the principles of space activities. At the same time, such decisions can be acts of a purely advisory and/or informational nature.

The prototype of such a legal system as the Outer Space Law of Principles can be oral or written agreements between two or more crew members of spaceships or space stations based on which they voluntarily regulate their relationships in space.

However, when it comes to such a permanent community, today it is unknown about the existence or attempts to create at least one system of permanent principles of space activity within the framework of the Outer Space Law of Principles. Most likely, this is the type of “law” that has yet to be introduced, and which over time would go beyond dogmatic models and become a new type of law for the entire Universe – “*Universum ius*”.

3. Subjects of Space Activities and Outer Space Law

3.1. Subjects of space activities

The subject of any activity usually implies an initiator and active participant in such activity, who has a goal and moves towards it and also makes decisions and controls such activity [15, p. 39]. In this regard, subjects of space activities include all participants in space activities – i.e., those who carry out activities related to the exploration and/or use of outer space and celestial bodies on Earth and/or beyond it [11, pp. 576, 577].

Therefore, *the subjects of space activities can be considered all types of individuals, non-state societies and communities as well as all types of public actors (various forms of political-territorial organization of society such as States and similar organizations as well as their unions and associations) who carry out activities on Earth and/or beyond it related to the exploration and/or use of outer space and celestial bodies.*

3.2. Subjects of Outer Space Law

In turn, subjects of law are commonly understood as participants in legal relations (actual or potential) who have **legal capacity** (formal legal capacity and dispositive legal capacity) in specific legal relations and can perform subjective rights and legal duty in such legal relations [1, pp. 394, 395].

Moreover, under the classical canons of law, at birth, any individual on Earth enjoys **legal capacity** that is recognized by public subjects of international law and public subjects of national law (States) by the place of national registration of such person and regardless of the participation or desire to participate in legal relations [1, p. 395].

For this very reason, subjects of law on Earth can be of two types as follows: a person who participates or declares a desire to participate in legal relations (an actual participant in legal relations) and a person who does not participate in such relations and does not declare the relevant desire (a potential participant in legal relations).

However, these rules cannot apply beyond Earth, since Cosmos is an alien environment for all legal actors on Earth (including States) and lies beyond their jurisdiction and national registration. Accordingly, classical **Earthly legal capacity** established by subjects of international law and subjects of national law on Earth does not apply to subjects of legal relations in the Cosmos.

In this regard, and given the fact that no one can establish a **legal capacity** for anyone in the Cosmos (since no one has jurisdiction in the Cosmos), the implication is that the **Cosmic legal capacity** is not the original attribute for all subjects of legal relations on Earth (i.e., it is not implied at birth). Accordingly, the **Cosmic legal capacity** cannot exist for a potential participant in legal relations – i.e., it cannot exist for a person who does not participate and does not declare a desire to participate in legal relations. In this case, it can be shown that the **Cosmic legal capacity** may be

attributed to an actual participant in specific legal relations related to space activities – i.e. the person who participates or has expressed a desire to participate in such legal relations with subsequent adherence to the provisions of the relevant legal systems of Outer Space Law.

Thus, **the subject of Outer Space Law** can only be an actual participant (who participates or is willing to participate) in specific legal relations related to space activities and is capable of exercising subjective rights and legal obligations in such legal relations.

In turn, according to existing dogmas, which are based on the canonical interpretation of the concept of a subject of law, it is generally accepted that only States and international organizations, on the similarity of the United Nations, can be subjects of Outer Space Law [15, p. 39]. This is justified by the fact that only States and international organizations are participants in international legal relations that arise in connection with space activities carried out under their jurisdiction and control [15, p. 39].

Certainly, in matters that concern Outer Space Public Law, this point of view may be partly correct, since States and international organizations can indeed be subjects of such law. However, the above list of subjects of Outer Space Public Law can be considered complete only for the present, provided this point of view does not take into account the possibility of the emergence in the future of new political-territorial organizations of societies (the form of which may differ from the form of the State) on celestial bodies and even in outer space beyond Earth.

I.e. it would be more correct to regard *the subjects of Outer Space Public Law as all types of public actors (various forms of political-territorial organization of society, including States and similar organizations, as well as their unions and associations) who take part in legal relations related to space activities by officially acceding to any provisions of Outer Space Public Law.*

At the same time, it is necessary to understand that in the process of space activities, new legal systems may be formed that differ from Outer Space Public Law, which have been discussed in this paper (e.g. Outer Space Law of Principles or Outer Space Private Law). Accordingly, for new legal systems, the interpretation of the concept of a subject of law would differ from the previous formulation.

For instance, taking into account the features of Outer Space Private Law described in this paper, it can be concluded that *the subjects of Outer Space Private Law can be all types of individuals, non-state societies, and communities that take part or want to participate in certain legal relationships related to space activities by adherence to the relevant provisions of Outer Space Private Law.*

In turn, *only Animal rationale individuals who openly declare recognition and explicitly comply with the relevant provisions of the Outer Space Law of Principles can be subjects of the Outer Space Law of Principles.*

4. Objects of Space Activities and Outer Space Law

4.1. Objects of space activities

Under the object of any activity is usually understood the passive and initiated aspect of such activity concerning which the subject's activity is directed [15, p. 39].

Accordingly, *objects of space activity can be all objects and goals of space activity claimed by subjects of space activity* [11, p. 577].

However, regarding objects of space activities declared in international documents during 1958-1963, first of all, it is necessary to pay attention to “an object launched into outer space”, since under the provisions of Paragraph 7 of the Declaration of Legal Principles, it is these objects to which there were proposed to extend the jurisdiction of States beyond Earth [18].

At the same time, the extension of such jurisdiction was conventional and formal, whereas, at the end of 1963, there was no precise definition of the concept “an object launched into outer space” in the Outer Space Law. Additional confusion was also created by the fact that during this period other names for such objects were repeatedly mentioned in United Nations documents: “satellite” (the UN GA Resolution 1721), “rocket launching facilities” (the UN GA Resolution 1802), “space vehicle” (the UN GA Resolution 1802) [11, p. 577]. Thus, the term “spacecraft” gradually became common in scientific literature. Further, the mentioned term began to be used in Outer Space Law [6, p. 7].

However, at this point, there was no specific and generally accepted definition and description for any of the above objects. By the way, at that time, there was an urgent need for a legal and/or technical description of such “the space objects”. Over the long period of development of Outer Space Law, various names and descriptions were proposed for such objects.

As a result of lengthy debates, some experts proposed to create a classification of “the space objects” according to technical and legal criteria for their definition and identification in terms of the extension of state jurisdiction [6, pp. 11–12].

Other experts concluded that the main criterion for determining “the space object” shall be its purpose, including one related to the exploration and use of outer space, involving celestial bodies. It was proposed to use this description principle for all similar “space objects”: “launcher vehicle”, “separate stages of the carrier rocket”, “the spent space objects”, “spacecraft”, “artificial satellites of the earth, the moon or other celestial bodies”, “equipment on the moon and other celestial bodies”, “interplanetary stations and laboratories”, “orbiting space platforms”, “stations”, “installations”, “separate debris of spacecraft that disintegrated”, and “space probes as well as detached parties of space objects”. At the same time, this list that “the space object” cannot include “Land stations (rocket launching sites, tracking and control stations, transmitting and receiving stations)”. Subsequently, there was a question concerning the possibility of regarding such objects as “spacecraft” (before and after its launch), and if so, the way to describe it. In the end, most experts agreed that “the criterion ought to be the ‘capability’ of spacecraft to move under said physical laws, [physical laws of astronomical flight] or any more appropriate definition of the forces or mechanics of its evolution” [6, p. 12].

As a result, the following alternative definitions have been proposed for both “spacecraft” and generally for “the space objects” that are launched from the Earth (although none of them have ever been admitted as a model):

– “Spacecraft means any objects designed to move in outer space, not needing support from the reactions of air” [6, p. 13];

– “All artificial bodies (manufactured by man) shall be space objects which are launched from the earth, with or

without crew, with the purpose of orbiting around the earth, moon or the sun by making use of the laws of Kepler (celestial mechanics) or of reaching from the earth another celestial body whether or not with the objective to stay at the place of destination” [6, p. 13];

– “The definition of space object should [also] cover any object or its component part launched with the view of performing flight in outer space for exploration and use of space including the moon and other celestial bodies, till the moment of its scientific dismantling or demolition” [6, p. 13];

– “On entend par engin spatial tout appareil susceptible de se déplacer dans l'espace extra-atmosphérique (et destiné soit à s'y désintégrer, soit à s'y maintenir conformément aux lois de la physique astronomique)” [6, p. 13];

– “Space device means any object launched toward (in the direction of) space. (Appareil spatial signifie tout objet lancé en direction de (vers) l'espace)” [6, p. 14];

– “Space device means any object intended for launching into space. (Appareil spatial signifie tout objet destiné à être lancé vers l'espace)” [6, p. 14].

The essence of all these proposals was to develop one unique name for all “space objects” that could be subject to State jurisdiction and provide a generalized and at the same time precise definition applying a technical description.

However, this was precisely the main drawback of all these proposals. They proceeded from the technical description of the object, and not from the essence of the issue that they needed to solve.

I.e. to resolve the issue of jurisdiction regarding “the space objects” in outer space, there was no need for their detailed description. It was enough to simply indicate that this jurisdiction could extend to the corresponding “artificial object in outer space or on a celestial body” (**Outer space artificial object** or **Cosmic artificial object**). At the same time, for jurisdictional issues, it also does not matter what this object is called, what purpose this object had before it was launched into outer space, or before it was assembled in outer space.

Taking into account all of the above, as of the end of 1963 the following objects in outer space or on celestial bodies could be classified as **Cosmic artificial objects** (artificial objects in Cosmos): satellites, objects launched into outer space, space vehicles, spacecraft, rocket launching facilities, equipment that used in space activities and other similar objects [6, p. 577].

As for the description of “the space objects” located on the Earth or in its airspace, the answer can also be quite simple.

Take as an example “a motorized bicycle”. At the moment when a driver pedals it, this vehicle is a bicycle, while at the moment when the engine is used, it functions as a moped. I.e., if a given device is intended to be both a bicycle and a moped, then it is called, respectively, a bicycle or a moped at the time of its use, depending on the way it is used.

In turn, if we take a tank, it becomes clear that it can be used to transport passengers. However, everyone understands that the only purpose of this technical equipment is to be used as a tank, i.e., a military weapon.

Taking into account the above, we can conclude that if the corresponding object is intended only for flights into outer space, then it can be conditionally called “spacecraft” and it would include all the equipment and its components, which are planned to be launched.

Provided such an artificial object is intended for flights both in outer space and in the airspace of the Earth, then during targeted flights in the airspace of the Earth it will have the status of “aircraft”, and during a targeted flight into outer space or back it may have “spacecraft” status.

I.e., we can conditionally say that a “*spacecraft*” is an artificial object the purpose of which is to fly into outer space and/or back, and which includes all the equipment and all its components that are planned to be launched.

At the same time, the place of such a launch can be either the Earth or the place of its assembly in outer space or on a celestial body.

In addition, it shall be taken into account that when such “spacecraft” moves into outer space beyond Earth, the mentioned “spacecraft” and all its parts and equipment would retain their names, but from a legal point of view, they turn into **Cosmic artificial object** (i.e., artificial objects in outer space or on a celestial body).

However, before leaving the Earth's airspace, such “spacecraft” would have the legal status of a “**Pre-Space Artificial Object**” (or “**Pre-Cosmic artificial object**”).

As for other objects of space activity, it is also necessary to underline the appearance during this period of such objects as “satellite communication”, which can conditionally be attributed to **technical phenomena** [6, p. 577].

Additionally, the UN Resolutions have repeatedly drawn attention to studies of any changes occurring on planet Earth as well as any phenomena in the Universe outside the Earth, which can be conditionally classified as **natural phenomena** [6, p. 577].

At the same time, the main objects of space activity have always been such objects as outer space and celestial bodies, which can be classified as **Space natural objects** (or **Cosmic natural objects**). However, it is necessary to remember that these objects could have an additional status. Thus, *outer space can be characterized as a separate all-encompassing spatial-territorial unit that does not fall under the jurisdiction of any State on Earth*. Therewithal, *the celestial body can be characterized as a separate large spatial-territorial unit, which also does not fall under the jurisdiction of any State on Earth* (except for the territories of the States on Earth, considering Earth is classified as a celestial body) [6, p. 577].

Thus, summing up the study of objects of space activity, it may be concluded that such objects can be conditionally divided into several types: natural space objects, prespace artificial objects, artificial space objects, technical phenomena, and natural phenomena [6, p. 577].

4.2. The Objects of Outer Space Law

In turn, the object of law is only legal relations between or among subjects of law (including their behavior within the framework of these legal relations), which are the subject matter of regulation or require regulation [1, pp. 200, 401].

In this regard, *the object of Outer Space Law can be considered legal relations (or space legal relations) between or among the subjects of Outer Space Law (including their behavior within the framework of these legal relations) in outer space and on celestial bodies, which are subject matter to regulation by the corresponding legal system of Outer Space Law within a particular society or community*.

E.g., for the United Nations (as a separate community), the object of Outer Space Public Law can be considered

international space legal relations between or among States within the UN. However, the object of Outer Space Public Law can also be space legal relations within other unions of States.

Moreover, if the object of law is legal relations, then the object of the legal relations is their subject matter – i.e., what these legal relations are aimed at. According to the canonical concept of law, the subject matter of legal relations usually includes the rights, duties, and responsibilities of subjects of law as well as tangible and intangible benefits obtained as a result of such legal relations [1, pp. 262, 288, 382, 401].

However, if this list of objects of legal relations is relatively acceptable for legal relations on Earth, then for Outer Space legal relations would be significantly different.

For instance, under the Outer Space Public Law, outer space and celestial bodies can be objects of legal relations, but not as material goods, since they do not fall under the jurisdiction of States and are not subject to appropriation.

At the same time, the results of research and non-destructive use of outer space and celestial bodies (such as “satellite communication” and the like) are highly likely to be the objects of such legal relations. Also, it is unlikely (although theoretically possible) that someday the liability of legal subjects would become the object of legal relations in Outer Space Public Law. Thus, *the objects of legal relations in Outer Space Public Law may include only rights and obligations of States established as a result of such legal relations as well as tangible and intangible benefits (except for outer space and celestial bodies) obtained as a result of space activities without the destruction of outer space and celestial bodies*.

In turn, under the Outer Space Law of Principles, the object of legal relations could be any benefits that do not contradict accepted principles. However, at the same time, the rights, obligations, and responsibilities of subjects of law cannot be the object of such legal relations, since in this legal system they are replaced by cosmic principles. Thus, *the objects of legal relations under the Outer Space Law of Principles can include only the principles of relationships as well as tangible and intangible benefits that do not contradict the mentioned principles*.

It seemed to suggest that the objects of Cosmic legal relations in most circumstances cannot be several objects familiar to legal relations on Earth, and therefore, for each legal system of Outer Space Law there would be its distinct objects of legal relations.

However, it is possible that such features would not exist in Outer Space Private Law, since there is a strong probability that legal relations in this legal system would be built on the same principles on which classical legal systems on Earth are based with a similar list of objects of legal relations.

In this regard, with a high probability, *the objects of legal relations under Outer Space Private Law would include the rights, obligations, and responsibilities of legal subjects as well as tangible and intangible benefits obtained as a result of such legal relations*.

5. Jurisdictions in Outer Space Law

5.1. Principles of jurisdictions

Before making any conclusions on the ways, the situations, and those to regulate space activities, it is necessary to understand the principles of jurisdiction that could be applied in outer space and on celestial bodies.

According to the doctrine of international law, the universal basis for jurisdiction is nationality and territory as well as the right to their protection [6, pp. 49–50]. In this regard, the discussion is only about Public jurisdiction (jurisdiction of States), since individuals and their communities do not have the totality of these elements and therefore the regulation of relations concerning them is carried out on other grounds.

It is generally accepted that Public jurisdiction always consists of two complementary regulatory elements: “*jurisdiction*” (Prescriptive [legislative] jurisdiction – the power of the State making laws and the competence to apply them to certain persons) and “*jurisdiction*” (Prerogative [enforcement] jurisdiction – administration of justice and enforcement of law in a certain territory) [6, pp. 34, 50].

In this regard, “*the concept (doctrine) of State jurisdiction means the right of a State to regulate the rights of persons, to affect property, things, events and occurrences whether by legislative, executive or judicial measure*” [6, pp. 34, 49].

At the same time, according to the method and scope of exercise of jurisdiction, the following types are distinguished: “exclusive jurisdiction” (State has an exclusive right to exercise jurisdiction), “concurrent jurisdiction” (more than one State may simultaneously assume jurisdiction over persons, things or occurrences), “complementary jurisdiction” (State may under international space law assume jurisdiction supplementing the jurisdiction of a third State) [6, p. 34].

At the same time, it is necessary to understand that only “exclusive jurisdiction” is a full-fledged and autonomous jurisdiction, and all other jurisdiction options are simply derivative elements based on interstate agreements.

In addition, when describing the concept of Public jurisdiction, three different types of jurisdictions are often distinguished: territorial, quasi-territorial, and personal [6, p. 50].

However, only in the case of territorial jurisdiction, the State has exclusive jurisdiction within its own territorial domain over things, property, persons, and legal transactions done within it, including the extraterritorial activities of such persons [6, p. 51].

In other cases, the jurisdiction is not generally recognized and exclusive jurisdiction, but is only part of individual contractual interstate agreements (i.e., treaty jurisdiction).

For instance, personal jurisdiction is the totality of powers of a State with respect to own vehicles, natural and legal persons (objects of jurisdiction) bearing its nationality, enjoying its protection, or owing it allegiance wherever they may be [6, p. 68]. I.e., it is mainly about objects of jurisdiction located within the territory of a foreign State (i.e., outside the territory of the State of their registration). This means that when carrying out activities, these objects will not fall under the exclusive jurisdiction of their State but will have to comply with the rules of a foreign State (in the way the foreign State allows). Accordingly, personal jurisdiction will not consist in the establishment by the State of registration of rules of conduct for such objects, but in establishing for them prohibitions on certain actions to the detriment of the State of their registration (provided that compliance with such prohibitions will not contradict joint agreements with a foreign State). Thus, we can say that personal jurisdiction is not exclusive jurisdiction but is only an element of an agreement between two States. Accordingly, personal jurisdiction also cannot be automatically applied on *terra nullius* (outside the territorial jurisdictions of States).

Wherein, quasi-territorial jurisdiction is the sum total of the powers of a State in respect of embassy, ships, aircraft, and spacecraft (to the extent to which they are also granted legal personality) having its nationality [6, p. 57]. I.e., quasi-territorial jurisdiction differs from personal jurisdiction in that it extends to all persons and things on board, including the activities of such persons, whether on board the craft or elsewhere [6, p. 57]. Accordingly, the theory of quasi-territorial jurisdiction considers the vehicle and embassy as the territory of the State of their registration located outside its internationally recognized territorial boundaries (within the territory of a foreign State or *terra nullius*). However, in this case, quasi-territorial jurisdiction is also not exclusive jurisdiction, but is only an element of an agreement between two States or within a group of States and can only apply to objects located on the territory of one contracting State, but which are the property of another contracting State. Thus, quasi-territorial jurisdiction also cannot automatically apply beyond the territorial jurisdictions of all States (*terra nullius*).

I.e., it can be concluded that personal jurisdiction and quasi-territorial jurisdiction do not entail absolute competence for any State, but are only elements of agreements and concessions between two or more States – in other words, they regulate the relations between or among these States.

Only territorial jurisdiction provides the State with an absolute and independent right to regulate any activity (but only within its territory).

5.2. Boundaries of spatial-territorial jurisdictions of States

According to the existing doctrine of jurisdiction, the actual jurisdiction of each State is directly related to its territory. In turn, this is since “*the notion of jurisdiction finds its origin in the concept of territory, the principle of sovereign equality and non-interference with the domestic affairs of States*” [6, p. 49].

Over a long period, States have protected their territorial integrity (i.e., access to natural, human, and tax resources within a certain territory), including by adopting and signing relevant legal acts and international treaties [11, p. 577]. Gradually, from the seventeenth century AD, the doctrine of jurisdiction began to emerge from the concepts of sovereignty and territoriality, which was finally established in the nineteenth century [6, p. 49]. This doctrine, on the one hand, asserted the rights of States in the territories they occupied, and on the other hand, limited their rights only to these territories.

Thus, States have established the principles of jurisdiction under which they have legal competence and can use resources only on their territory, and, accordingly, do not have the competence and right to use objects (resources) outside their territory [11, p. 577].

In turn, as of the end of 1963, the boundaries of State territories (exclusive jurisdiction boundaries), in most cases, had already been determined, both on land and in water. Within these borders, the State has exclusive jurisdiction, and beyond them (*terra nullius* or on the high seas) the exclusive jurisdiction of the State ends [4, p. 4].

Wherein, the provisions of Article 1(1) of the Chicago Convention on International Civil Aviation (7 December 1944) established as follows: “*The contracting States recognize that every State has complete and exclusive sovereignty over the airspace above its territory*”. Thus, the spatial-terri-

torial jurisdiction of States is not limited to the surface of the Earth but is directed up into space and down to the center of the Earth, somewhat reminiscent of the shape of an inverted cone with uneven sides that coincide in shape with the borders of States on the surface of the Earth [4, p. 4].

If the issue of the lower limit of State jurisdiction has not yet been raised, then the question of the need to determine the upper limit of the spatial-territorial jurisdiction of States has been discussed for a very long time. Moreover, there are many theories and proposals on this topic, classified by McDougal, Lasswell, and Vlasic: (1) proposals based upon prescriptions of the Air Conventions, (2) proposals based upon varying physical characteristics of space, (3) proposals based upon varying natures of flight instrumentalities, (4) proposals based upon the factors of effective control, (5) proposals based upon the earth's gravitational effects, and (6) proposals based upon arbitrarily chosen altitudes [11, p. 579].

Take as an example, that one of the most popular proposals on this topic is to limit the airspace of States to the upper limit at which the force of gravity influences. However, it is very difficult to implement this proposal, since it is difficult to determine an object of ideal shape, weight, and density on which such experiment can be carried out. Perhaps this experiment could be carried out with an international prototype kilogram made of a platinum-iridium alloy (90% platinum, 10% iridium) and stored at the Bureau International des Poids et Mesures (in the city of Sèvres, France).

Also, there is a proposal to limit the airspace of States based on the geophysical meaning of the term "airspace", i.e., airspace ends at the air's edge. However, it is necessary to remember that "air is a mixture of gases and is not a chemical compound". At the same time, there is no clear boundary between airspace and space without air (filled with vacuum), since the content of gases in near-Earth space is observed from the surface of the Earth and further hundreds and thousands of kilometers upward. In this regard, some scientists proposed considering the upper limit of the airspace of States to be a height of 5.8 kilometers (approximately 3.6 miles) above sea level, below which is half of the air in the Earth's atmosphere [4, p. 5].

In addition, there is a theory about determining the upper limit of airspace at an altitude of 60 miles (approximately 100 kilometers), above which a relative vacuum can begin. However, at the same time, there were also versions that the vacuum could only begin above 400 miles (about 644 kilometers) [4, p. 5].

In turn, one of the most promoted proposals for the delimitation of air and outer space is to consider the upper limit of the airspace of States to be the maximum altitude at which there is enough air for there to be a "lift" from the air" for aircraft flights and balloons [4, p. 6].

However, despite such a large number of proposals and theories, all of them remained only subjects of behind-the-scenes negotiations, and none was taken as a basis since it was not considered acceptable from a scientific point of view [2, p. 138].

Perhaps the issue of delimitation of outer space and the spatial-territorial (air) borders of States has remained unresolved to this day because the expansion of the exclusive jurisdiction of States upward into space depends on it – i.e., the expansion of political influence. In any case, since the States failed to agree on such delimitation of space, it remains unclear how far the jurisdiction of a State extends in

aerospace over its territory [2, p. 137].

In turn, when studying this issue, it is necessary to understand that the aspect of the spatial-territorial jurisdiction of the State is connected not only with the exploitation and use of the controlled space but also with the security of the existence of the State itself and its population. Thus, this issue is not only legal or technical-physical but also political.

I.e. to say, the main question of the spatial jurisdiction of the State is not about the border between outer space and airspace, but concerning the demarcation of the upper limits of the spatial-territorial jurisdiction of the State – in other words, it is about the border between outer space and the air-political space of the State.

To determine this border, it is necessary to understand that the air-political space of the State ends where the threat to the security of its existence (sovereignty) disappears.

Taking this into account, the air-political space of each State may be conditionally divided into at least three layers of security: a layer of life safety, a layer of economic security, and a layer of atmospheric (natural) security.

The layer of life safety of the State would always be limited by a human's ability to exist since without the existence of a human being the State cannot exist. In turn, an ability to exist at appropriate heights is most often determined by historical experience. To be sure, there are historical instances of the conquest of the mountain peak Zhumulangma (or Everest) by people without using additional oxygen (in May 1978, this was done by Reinhold Andreas Messner and Peter Habeler). I.e., theoretically, one is capable of living and existing at least for a short time at the height of this peak, which is 8 849 meters (about 5.5 miles) above sea level, or slightly higher. Thus, we can roughly say that ***the upper limit of the State's life safety layer would end at an altitude of about 9 000 meters (9 kilometers or 5.6 miles) above sea level.***

The layer of economic security of the State, first and foremost, shall be associated with the maximum existing height of air transportation (passenger and cargo) as well as with the prospective height of such transportation in the next 20-30 years after the boundaries of the layer are established. In this regard, the upper limit of the economic security layer could be set at twice the maximum height of air carriage (taking into account possible prospects for increasing the height). E.g., if the maximum altitude for cargo and passenger transportation (which can also include an independent flight from base to base of military aircraft, including pilotless and man-carrying aircraft) is about 30 kilometers, then ***the upper limit of the State's economic security layer would be at an altitude of 60 kilometers (about 37.3 miles) above sea level.***

In turn, the layer of atmospheric (natural) security of the State would, first of all, be associated with the size and composition of the atmosphere, which affects the preservation of the natural human habitat on Earth and in water. E.g., the Earth's ozone layer is located at an altitude of approximately 10 to 40 kilometers, and its destruction over the territory of the State can lead to the destruction of the nature and population of that State. I.e., the thickness and composition of the Earth's atmosphere over the State shall remain such as to preserve the ozone layer and protect the Earth's surface from excess solar radiation. Also, the height, density, and composition of the Earth's atmosphere above the State shall remain such as to ensure atmospheric pressure within limits sufficient for its normal perception by humans and animals.

However, the most important aspect of the atmospheric security of the State is the risk of a potentially dangerous “object X” (a new active chemical element, a virus, an intelligent biological organism, or a similar object) entering the atmosphere of the State from space, which, if it gets the Earth, is capable of destroying flora, fauna, and even the people in this State. E.g., while passing through the atmosphere of a neutral State, when a spacecraft returns to Earth, some unknown space “object X” (previously attached to the ship in outer space or on a celestial body) may detach from it. We can say that at this moment the “X factor” arises - the factor of “object X” entering the Earth’s atmosphere. Imagine that this “object X” is an unknown chemical element that is inactive in a vacuum, but when combined with oxygen it could influence the atomic structures of known chemical elements (e.g., turn steel into powder). After such “object X” gets the Earth, our civilization may return to its primitive state. After all, the alchemists’ legends about the philosopher’s stone may be based precisely on such a cosmic “object X”. Unfortunately, terrestrial technologies can identify in space those objects that they have already encountered and identified on the Earth. I.e., there is a high risk that none of the space researchers would simply be able to detect this new “object X” and it could be introduced into the atmosphere of the State that does not carry out space activities and does not have technologies capable of protecting it from “object X”. Accordingly, the question arises at what height (the height of the “factor X”) the density and/or composition of the Earth’s atmosphere are sufficient so that, upon entering the Earth’s atmosphere, this “object X” could further move into the life safety layer of the State and cause catastrophic damage. In turn, some scientists believe that the size of the atmospheric layer (including all its various layers, the troposphere, the ozonosphere, the ionosphere, and, to some extent, the exosphere), in which the gas-air space of the Earth is present, is located up to the height 1000 kilometers above sea level (about 621 miles) [4, p. 7–8]. Due to this, we can conditionally assume that ***the upper limit of the State’s atmospheric security layer would be at an altitude of about 1000 kilometers (about 621 miles) above sea level.***

Taking into account all of the above, we can conclude that ***the upper limit of the entire layer of spatial security of a State (about 1000 kilometers above sea level) can be defined as the limit of the spatial-territorial jurisdiction of each State, below which the State would have exclusive jurisdiction.***

In turn, above 1000 kilometers and up to an altitude of 36 000 kilometers above sea level there is a layer of the atmosphere, which can conventionally be called the orbital layer (the layer in which the largest part of the artificial orbital satellites of the Earth is located). However, it is unlikely that this layer affects the security of only one State since it does not have a direct impact on the existence of the people of one particular State - most likely, the preservation of this layer and the possibility of using its orbits would serve for the security of all humanity on planet Earth. Therefore, conditionally, this layer can be called **the layer of spatial security of humanity** (up to an altitude of 36 000 kilometers or 22 370 miles above sea level) and the right to use it shall belong to all of humanity.

In addition, it is also necessary to underline such an object as the Moon, which is located from the Earth at a distance of approximately 378 000 kilometers (approximately 234 878 miles). Although the Moon is located further

than 36 000 kilometers from the Earth, it affects the nature of the Earth and its damage, change or destruction can have a catastrophic impact on all of humanity. Therefore, it would be logical to include the Moon in **the layer of spatial security of humanity**. Thus, ***the layer of spatial security of humanity would include the layer of atmosphere around the Earth up to an altitude of 36 000 kilometers (or 22 370 miles) above sea level and the Moon.***

At the same time, no State jurisdictions can exist in this layer and its use shall be carried out following plans and permissions received from non-state and non-political representatives of all humanity. Over time, to properly regulate activities in this layer, non-government, non-political, and independent bodies and organizations (public, scientific, and similar organizations) shall be established to make effective decisions regarding the use of this layer for peaceful purposes and the benefit of all humanity.

As for space above 36 000 kilometers and beyond the Moon, it can be considered alien outer space: space, i.e., alien both to the States and to all humanity on Earth.

5.3. Regulation of the activities in outer space and on celestial bodies

5.3.1. Widespread theories

The matter of regulating space activities, human relations, and state-to-state regulations (including those related to the jurisdiction of States) in outer space and on celestial bodies has existed from the very beginning of the development of Outer Space Law.

Attempts to solve this problem have led to the emergence of many concepts, theories, and proposals for determining the competence of subjects of space activities in outer space and on celestial bodies.

According to one of the most popular concepts of international public law, the State can act wherever direct prohibitions and restrictions are not established for it under international law, and sometimes it can even go beyond the framework of international law [5, p. 146]. This concept is a kind of “narcissist” concept since it invites States to act on the principle of “everything that is not prohibited is permitted,” and also to make decisions and act outside their territory based on their interests regardless of the interests of humanity.

However, based on this concept, three theories arose for the regulation of activities in neutral territories, which can be described as follows: “*Res Communis*” (or “*Res Communis Omnium*”), “*Res Nullius*”, and “*Res Communis Humanitatus*” (or “the Common Heritage of Mankind”) [5, p. 147].

According to the first theory of “*Res Communis*”, outer space and celestial bodies are considered a common territory [5, p. 147]. Therefore, all States, their citizens, and legal entities are free to explore, use, and develop the “commons” area. Previously, this theory was especially popular among underdeveloped States willing to receive income from the use of raw materials outside their territory (*terra nullius* or on the high seas). However, when it came to outer space and celestial bodies technologically developed States supported this theory since this allowed them to operate in space as if on equal terms but enrich faster than underdeveloped States that are unable to get to space [5, p. 147]. Moreover, there is an opinion that by agreeing to the UN GA Resolution 1721 States recognized outer space and celestial bodies as the territory of “*Res Communis Omnium*” [14, p. 12].

Under the second theory, “*Res Nullius*”, outer space and

celestial bodies are the territory that belongs to no one. However, this theory does not prohibit States or other actors from taking possession or control of the territory of “*Res Nullius*” for their exclusively sovereign purposes by right of first discovery or use [7, p. 38]. In this regard, this theory, which has imperialist and colonial motives, is attractive to States that claim world hegemony.

According to the third theory, “*Res Communis Humanitatus*”, outer space and celestial bodies are the common territory of all humanity. Therefore, all States, their citizens, and international entities are free to explore, use, and develop the common territory but only in the interests of humanity and on the condition that they share the resulting benefits with other participants (i.e., there is a joint use aspect) [5, p. 147].

However, despite high popularity, all these theories remain only theories, and the very concept of “narcissism” cannot be called perfect and acceptable, because it does not consider the element of equality for everyone and the possibility of the existence of alien intelligent beings in the Universe. Moreover, we can say that an attempt to extend this concept to outer space and celestial bodies is a dangerous process that could provoke a new space race and lead to a new type of armed conflict – space warfare.

5.3.2. The position of the UN General Assembly as of the end of 1963

Trying to resolve the issue of regulating space activities, by the end of 1963 the UN General Assembly announced several statements on this subject in the UN GA Resolution 1721 and the Declaration of Legal Principles, which could be formulated as follows:

“Outer space and celestial bodies are not subject to national appropriation by claim of sovereignty, through use or occupation, or by any other means.

The jurisdiction of States extends to all objects registered by them located in outer space and to astronauts thereon.

The activities of States in the exploration and use of outer space and celestial bodies shall be carried on following international law, including the Charter of the United Nations” [11, p. 579].

However, these statements did not answer questions about the competence of space actors. On the contrary, having announced these provisions, the UN General Assembly immediately faced the need to solve new problems related to the regulation of activities in outer space and on celestial bodies:

- determining the possibility of States applying national law in outer space and on celestial bodies,
- determining the boundaries of the competence of States to apply national law regarding their **Cosmic artificial objects**,
- determining the boundaries of the competence of States to apply national law regarding astronauts in the **Cosmic artificial objects** of these States,
- determining the possibility of States and international bodies applying international law in outer space and on celestial bodies.

5.3.3. The possibility of States applying national law in outer space and on celestial bodies

It should also be stated that throughout the entire period of development of Outer Space Law, mainly all the difficulties in determining the competence of public subjects of

space activities were associated with attempts to transfer classical law into the legal field of outer space and celestial bodies.

However, as mentioned above, all attempts to apply classical legal concepts in space activities would never be successful since outer space and celestial bodies are not the natural human habitat, but are alien space and an uninhabitable environment.

In turn, when in ordinary life people are in their own space (e.g., in their room), then they naturally have a certain right to establish their own rules of behavior and relationships in such a space – i.e., for them there is a principle that can conditionally be called the “*domestic room*” principle. Our planet Earth serves as a “*domestic room*” for humanity.

However, when people get to alien space (for instance, enter someone’s else room), they can no longer set their own rules there and cannot use alien space to their advantage. They can only agree on the way they should behave on a visit – i.e., a principle, which can roughly be called the principle of “*alien room*” takes effect. These rules of behavior and relationships in an “*alien room*” (on a visit) in the context of outer space and celestial bodies can be regarded as Extraterrestrial Law or Outer Space Law [11, p. 573].

The boundary between the “*domestic room*” and “*alien room*” in the Universe for people is **the upper limit of the spatial security layer of humanity** at an altitude of 36 000 kilometers above sea level (as discussed earlier).

In turn, both for the States and for the people, the principles of “*domestic room*” and “*alien room*” are also applied. However, unlike people, the “*domestic room*” of States is much smaller, since it is limited not by planet Earth but by their spatial-territorial jurisdiction [11, p. 575]. This is due to the fact that the concept of State jurisdiction is based on the element of territoriality in the notion of sovereignty and the principle of national appropriation [6, p. 51]. At the same time, the exercise of State jurisdiction on Earth is primarily a function of the operation and use of the controlled territory, – accordingly, the exercise of State jurisdiction in outer space is a function of exploitation and use of outer space also [6, p. 39]. In turn, even the Declaration of Legal Principles proscribed the principle of national appropriation from outer space and celestial bodies. It follows that the rules of spatial-territorial jurisdiction of States do not apply to outer space and celestial bodies, since these spatial-territorial units are in an “*alien room*” concerning States. Thus, the State cannot apply national law in outer space and on celestial bodies and, accordingly, cannot use outer space and celestial bodies.

At the same time, the fact that the State lacks jurisdiction and any other competence in outer space and on celestial bodies (beyond the Earth) exists on its own and should not require proof or recognition by other States or the United Nations – if so, the claim can be accepted as the truth [11, p. 577]. The desire of certain States to extend their jurisdiction to the “*alien room*”, even if it is supported by the majority of States from the rostrum of the United Nations, cannot violate the principles of “*domestic room*” and “*alien room*” based on the spatial-territorial jurisdiction of States. Otherwise, the very principle of jurisdiction and sovereignty of States can become meaningless. Everything is quite simple – the State has jurisdiction and can act freely only within the boundaries of its spatial-territorial jurisdiction (“*domestic room*”).

At the same time, the boundary between the “*domestic room*” and “*alien room*” for States is **the upper limit of the**

State's spatial security layer at an altitude of 1 000 kilometers above sea level (as discussed earlier).

Based on the above, we can conclude that none of the above subjects (neither States nor individuals) could establish standards of behavior in the “*alien room*” (outer space and celestial bodies) for other subjects of space activities. All of them can only agree on the way they would interact in outer space without doing harm.

Moreover, outside of its spatial-territorial domain a State cannot even use outer space and celestial bodies, but can only negotiate with other States and other subjects of space activities on the possibility of conducting any activity without causing damage to outer space, celestial bodies, and other subjects of space activities. At the same time, such activities cannot be carried out in the interests of only one State or group of States, but can only be carried out in the interests of all humanity as a whole. Any actions of States that violate these conditions can be regarded as a direct challenge to all humanity.

This concept of regulating activities in outer space and on celestial bodies may be formulated as follows: “*Res Nullius Civitatis et Res Communis Animal Rationale*”, or in a more expanded way - “*Res Nullius Civitatis*” [11, p. 578].

5.3.4. The limits of the competence of States to apply national law regarding their Cosmic artificial objects and astronauts thereon

Separately, it is necessary to underline the provisions of Paragraph 7 of the Declaration of Legal Principles, according to which the jurisdiction of States would extend to “an object launched into outer space and any personnel thereon”:

“The State on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and any personnel thereon, while in outer space. Ownership of objects launched into outer space, and of their component parts, is not affected by their passage through outer space or by their return to the earth. Such objects or component parts found beyond the limits of the State of registry shall be returned to that State, which shall furnish identifying data upon request prior to return” [18].

This statement is an attempt to establish quasi-territorial jurisdiction and personal jurisdiction on the **Cosmic artificial object**. At the same time, States justify quasi-territorial jurisdiction with the right of ownership of an object and personal jurisdiction with the concept of citizenship, accepting citizenship as the basis of state jurisdiction [6, p. 69].

However, despite the apparent “positive elements” of this provision related to the possibility of regulating legal relations within a **Cosmic artificial object**, this statement is purely colonial.

It is necessary to understand that high-tech Space States are constantly expanding their **Cosmic artificial objects** into outer space and onto celestial bodies, thus occupying the most advantageous places on celestial bodies and orbits around the Earth. It is already the case that no one can voluntarily remove them from these places. In the future, using the provision of Paragraph 7 of the Declaration of Legal Principles, these States would declare their jurisdiction over their Cosmic artificial objects and, thus, expropriate the physical places in outer space and on celestial bodies occupied by these objects without the consent of others States and humanity.

However, as was already mentioned, States do not have

any competence in space above **the upper limit of the State's spatial security layer**, according to the principle of the “*alien room*”.

At the same time, it is necessary to remember that quasi-territorial jurisdiction and personal jurisdiction are not jurisdictions in the literal sense of the word, but are only elements of an agreement between two States or within a group of States and can only apply to objects that are the property (or citizens) of one treaty States but are located on the territory of another treaty State.

However, in this case, Cosmos (which is an “*alien room*” for States and people) has no owner and therefore States have no one to agree with on establishing a prototype of quasi-territorial jurisdiction and personal jurisdiction.

I.e., in Cosmos, there cannot be any quasi-territorial jurisdiction and personal jurisdiction regarding the **Cosmic artificial object** and the astronauts thereon.

Accordingly, States cannot apply national law concerning their **Cosmic artificial objects** and the astronauts thereon, but can only agree with other subjects of space activities on modalities of the activities of their astronauts and **Cosmic artificial objects** in this environment without possessing jurisdiction over them. However, the lack of jurisdiction does not mean the absence of State responsibility for the activities of such objects. At the same time, in addition, States would also need to agree on the format of activities with their astronauts, who would leave the jurisdiction of the States of registration after crossing **the upper limit of the State's spatial security layer**.

In the absence of such agreements, the only right that States have about **Cosmic artificial objects** is the right of ownership, and concerning the astronauts thereon – the right to prohibit the actions of astronauts to the detriment of the State of their registration.

5.3.5. The possibility of States and international bodies applying international law in outer space and on celestial bodies

As in the case of national law, regarding international law, there are also many theories and proposals for its application in outer space and on celestial bodies.

E.g., under the most widespread theories the entire Universe can be divided into two spaces: national (each State has its own national space) and international (all other space, including outer space) [6, p. 40]. Accordingly, national law can be applied within the boundaries of the national space, and peremptory norms of general international law (*ius cogens*) can be applied within the boundaries of the international space. This position corresponds to the previously described theory of “*Res Communis*”.

Some lawyers have proceeded even further, declaring that laws shall follow people in the Universe, promoting Earth laws for the entire Universe [6, p. 40]. This theory has a little bit of religiosity since it reinforces the position that human is the most supreme intelligent being in the Universe excluding the existence of extraterrestrial intelligence.

In turn, to understand this issue, it is enough to “remember” that the creators and actual founders of the institution of international law are the member States of the United Nations.

However, as already said, the jurisdiction of States (including legislative jurisdiction) does not extend to outer space and celestial bodies above **the upper limit of the State's**

spatial security layer – i.e., the jurisdiction of States is limited to their “*domestic rooms*”.

At the same time, the United Nations (the members of which are only States) does not have the authority to grant States additional competencies and rights of use outside their territory, since this is not provided for by the UN Charter. Moreover, according to paragraph 7 of Article 2 of this Charter, the UN has no right to interfere in the internal affairs of States, i.e., it has no right to act in such a way even to expand their territorial jurisdiction [11, p. 577]. Therefore, substantially, the actual jurisdiction of the United Nations is limited to the jurisdiction of the Member States, which in turn are limited to their territorial jurisdiction.

I.e., the “*domestic room*” of the United Nations (which operates based on its Charter, which is an ordinary international agreement) is also limited by the jurisdiction of the United Nations itself, which is limited by the jurisdiction of the Member States of this Organization, which in turn are limited by their spatial-territorial jurisdiction [11, p. 573].

Accordingly, neither the States nor the United Nations can establish standards of behavior in the “*alien room*” (outer space and celestial bodies) for other space actors. All of them can only agree on the way of interaction without causing harm in the “*alien room*”.

As the Representative of France to the United Nations correctly noted: “*International law and the Charter of the U.N. do not apply to space activities in toto*” (this French representative's suggestion was supported by other representatives to the United Nations) [6, pp. 39-40].

At the same time, the rules of international law are applicable concerning the terrestrial effects of space activities – in other words, these rules shall be considered applicable when they are supposed to operate in their traditional environment [6, p. 51].

It seemed to suggest that the established principles and rules of general international law can be applied only in two cases of space activity:

- to regulate relations between or among States in outer space and on celestial bodies;
- to govern the jurisdictional aspects of the terrestrial effects of space activities [6, p. 39].

I.e., international law cannot be imposed and applied in outer space and on celestial bodies as “*ius cogens*”, but “*ipso facto*” can be applied as an element of Outer Space Public Law regulating relations between or among States in this environment [6, pp. 40-41].

6. General Principles of Outer Space Public Law.

6.1. Despite the many unsolved problems in the field of regulation of space activities that arose during 1958-1963, the international community still managed to move a little forward in the formation of the main theses of Outer Space Public Law.

Conventionally, the mentioned theses can be formed into several General Principles of Space Activities, which can be considered the basis for the development of modern Outer Space Public Law.

The main feature of these principles is that they were not agreed upon and formalized in international treaties, but most often took the form of a kind of *Conventionalis stipulatio* (joint public commitment), which was set out in one or more Resolutions and/or Declarations of the UN [8, p. 349].

Wherein, in this study, the term “Cosmos” is mainly

used to determine the name of these principles, and not “Universe” or “outer space and celestial bodies”. And this is not due to the astronomical or physical characteristics of space-time-matter but to the everyday perception of an average person [8, p. 350]. Historically speaking, most people perceive the concept of “Universe” as the whole world that surrounds a human, who is perceived as one of the elements of this world. Considering that the planet Earth, along with the rules established on it, is also part of our “Universe” (in the ordinary sense), the application of this term to the space outside the planet Earth becomes incorrect [8, p. 350]. At the same time, the concept of “outer space and celestial bodies” when translated into different languages often has different meanings and cannot be translated literally. Moreover, this concept has a vague meaning because it does not take into account stars as well as air and other gaseous layers around celestial bodies.

In turn, the concept of “Cosmos” is mainly perceived as a definition of space beyond the planet Earth, which includes both cosmic objects and the space between them [8, p. 350]. Therefore, the use of this term to name the processes of regulating relations outside of planet Earth is likely to be more correct.

Given the above, the General Principles of Space Activities in the Outer Space Public Law formed as of the end of 1963 can be formulated as follows:

- The Principle of Free Cosmos;
- The Principle of Peaceful Cosmos;
- The Principle of Useful Cosmos;
- The Principle of Cosmic Traffic.

The description of the main process of formation and development of these principles during 1958-1963 was previously published in papers from this series: “Outer space public law: the 1958-1963 period. Part 1” [8] and “Outer space public law: the 1958-1963 period. Part 2” [9]. Hence, this paper outlines only the main aspects of the creation and formulation of the General Principles of Space Activity.

6.2. Conventionalis stipulatio “The Principle of Free Cosmos”

When describing this principle, the concept of Free Cosmos refers to both passive and active characteristics of such freedom.

At the same time, the passive characteristic of Free Cosmos is its independence and neutrality. I.e. freedom from any territorial and other claims both from States and individuals [8, p. 350]. In turn, an active characteristic of Free Cosmos is the possibility of its unhindered visiting and exploration by any individual, including those representing the interests of any State or other community [8, p. 350].

Thus, the Cosmos (including outer space and celestial bodies) in this case is the object of this principle, and individuals, States, and other communities are its subjects [8, p. 350].

At the same time, it is necessary to say that in 1958-1963 this principle just started to develop leading to many discussions and disputes. Therefore, its formation took place not only based on specific provisions of the Declarations and conclusions in Resolutions but also based on individual statements, proposals, and assumptions of the UN General Assembly. In this regard, at the end of 1963 this principle could be formulated as follows:

“*Outer space and celestial bodies are free for exploration by all States (on a basis of equality and by international law) as well as by all people, private companies, non-go-*

vernmental organizations, and other interested parties.

Outer space and celestial bodies are not subject to national appropriation by claim of sovereignty, use or occupation, or by any other means” [8, p. 351].

6.3. Conventionalis stipulatio «The Principle of Peaceful Cosmos»

This principle began to take shape since the adoption of the UN GA Resolution 1148 and continues to be relevant to this day.

At the end of 1963 this principle could be formulated as follows:

“All subjects of space activities can explore and use outer space exclusively for peaceful purposes, act only in the interests of maintaining international peace and security as well as for the development of international cooperation and mutual understanding, and have no right to carry out propaganda of war in space activities.

All subjects of space activities shall refrain from placing, installing, and stationing in any other manner (and to refrain from causing, encouraging, or in any way participating in the conduct of the foregoing activities) in orbit around the earth and in outer space and on celestial bodies any objects carrying nuclear weapons or any other kind of weapons of mass destruction.

At the same time, States undertake not to carry out or take part in carrying out any nuclear weapon test explosion in places that are located in outer space and on celestial bodies, and which are under the jurisdiction or control of these States” [8, p. 353].

This principle imposes an absolute prohibition on the placement in outer space of any weapons and equipment that could be used in armed conflicts.

At the same time, any satellites or other equipment that could in some way be used for military purposes should have been launched only with the permission of the UN and under its full control with open access for any State to the information received from such equipment [8, p. 353].

However, already at this stage, the first contradictions arose regarding compliance with this principle.

These contradictions have resulted in multiple *“Fraus legi fit”*, which some States use to interpret the phrase “peaceful purposes” in their military interests [8, p. 353].

Proponents of preserving Peaceful Cosmos claim that the phrase “peaceful purposes” means “non-military purposes” [16, p. 82] – i.e., a prohibition on the use of outer space for any military purposes and placing any military facilities.

Proponents of Cosmos weapons claim that the phrase “peaceful purposes” means “non-aggressive purposes” [16, p. 82] – i.e., the possibility of placing military objects in outer space (e.g., for reconnaissance and surveillance), if they are not used for forceful actions or threats of force. Although this option is the most absurd (because any military facilities, directly or indirectly, are used to carry out military force), nevertheless, it is this option that prevails in the world today [3, p. 337] and is most actively promoted by the United States to ensure its military hegemony in outer space and on Earth [17, p. 82].

At the same time, some politicians justified the military use of space by the absence of a line between the military and peaceful use of outer space, since supposedly in both cases the goals can be duplicated [2, p. 142]. In this case, this meant navigational actions or military actions to fore-

stall an enemy attack and to protect the world.

However, no matter how some people try to justify military actions, they remain military actions, and the game of interpretation would remain an ordinary political game. The difference between military and peaceful goals has always been very simple - military goals are always directed against someone (even if they are carried out for the benefit of someone), and peaceful goals are always carried out for the benefit of someone and are never directed against someone.

Thus, any deployment of military objects in outer space contravenes peaceful purposes [17, p. 83] and also contradicts “The Principle of Peaceful Cosmos” [8, p. 354].

6.4. Conventionalis stipulatio “The Principle of Useful Cosmos”

This principle can be stated as follows:

“All States can explore and use outer space exclusively for the benefit and interests of humanity, avoiding national rivalries into this field” [9, p. 643].

Thus, any other provisions of international documents that grant States any rights to use outer space and celestial bodies can only be applied within the framework of the above formulation of “The Principle of Useful Cosmos” and to the extent that does not contradict “The Principle of Free Cosmos” and the condition of *“Res Nullius Civitatis”* [9, p. 643].

6.5. Conventionalis stipulatio “The Principles of Cosmic Traffic”

It can be considered that from the moment of the adoption of the UN GA Resolution 1721 and the Declaration of Legal Principles, an international process of regulating space activities began, within the framework of which several proposals were made, which can roughly be called *Conventionalis stipulatio* “The Principles of Cosmic Traffic”.

As of the end of 1963 this collection of principles included three special principles of space activities (The Principle of registration of launches, The Principle of mutual assistance, and The Principle of responsibility), which can be described as follows.

The Principle of registration of launches (the 1st Principle): *“States launching objects into orbit or beyond undertake to register such launches to the Committee on the Peaceful Uses of Outer Space under the rules established by this Committee”* [9, p. 644].

The Principle of mutual assistance (the 2nd Principle): *“States shall render to astronauts all possible assistance in the event of accident, distress, or emergency landing on the territory of a foreign State or the high seas. Astronauts who make such a landing shall be safely and promptly returned to the State of registry of their space vehicle. Objects launched into outer space or component parts found beyond the limits of the State of registry shall be returned to the relevant State, which shall furnish identifying data upon request prior to return”* [9, p. 645].

The Principle of responsibility (the 3rd Principle): *“All States that carry national activities in outer space (including States which launch or procure the launching of an object into outer space, and each State from whose territory or facility an object is launched) bear international responsibility for national activities in outer space (including for the activities of governmental agencies or by non-governmental entities), for assuring that national*

activities are carried on in conformity with the principles outlined in the Declaration of Legal Principles, and for damage to a foreign State or its natural or judicial persons by such object or its component parts on the earth, in air space, or outer space.

International organizations bear international responsibility for activities in outer space to ensure that activities are carried on in conformity with the principles outlined in the Declaration of Legal Principles.

The implementation by States or its nationals of space activities (including experiments) that would cause potentially harmful interference with activities of other States in the peaceful exploration and use of outer space is possible only after an international consultation concerning the activity or experiment" [9, p. 646].

It should be separately noted that all these principles of Cosmic traffic did not take the form of imperative and mandatory norms but naturally turned into elements of law since all subjects of space activity adhered to or tried to adhere to these principles to ensure the safety of space movement.

CONCLUSION

Despite all the diversity, the Universe is one giant system with uniform physical and chemical laws throughout its entire space.

However, the current study suggests that human imperfection is the reason why it is essential to divide the Universe into two separate legal spaces concerning jurisprudence and human life: the "domestic room" and the "alien room".

At the same time, the paper proposes that the "domestic room" of humanity shall include the planet Earth and a **layer of spatial security for humanity**, which ensures the livelihoods of all humanity and includes the air-orbital space around the planet at least up to an altitude of 36 000 kilometers (about 22 370 miles) above sea level and the Moon. At the same time, the "domestic room" of any State, which is determined by its spatial-territorial jurisdiction, shall be located at an altitude no higher than **the upper limit of the State's spatial security layer** at an altitude of about 1000 kilometers (about 621 miles) above sea level (i.e., inside "domestic room" of humanity).

In turn, the "alien room" for States and humanity is the Cosmos (including outer space and celestial bodies throughout the Universe) beyond the layer of spatial security of humanity (beyond the Moon and above 36,000 kilometers above sea level around the Earth).

Upon that the emphasis of the study is on the fact that neither people nor States can establish their own rules in an "alien room" for the entire Universe, but can only agree on the way of behavior and relationships when visiting such an "alien room" (i.e., on a visit).

Taking these features into account, the process of regulating space activities in Cosmos can be specified as a unique process. Moreover, this process is very recent in origin (not

accounting for religious theories) and is only taking its first steps, resembling the process of formation of classical law in Ancient Egypt and Ancient Rome.

It is precisely because of the youth and uniqueness of the process of regulating space activities that the study suggests the possibility of the development in the future of several legal systems in Outer Space Law, such as Outer Space Law of Principles (or *Animal rationale ius*), Outer Space Private Law (or Cosmos Private Law), Outer Space Public Law (or Cosmos Public Law).

In turn, subsequently, this may also lead to the emergence of new subjects of Outer Space Law, in addition to States and the United Nations, and therefore, the study proposes introducing a new interpretation of the term "the subject of Outer Space Law" different from the outdated classical interpretation of the term "the subject of law".

In addition, it should be noted that in the process of development of space activities during 1958-1963, the subject and object structure of such activities was gradually formed. At the same time, due to the lack of an effective classification of objects of space activity, this study proposes to divide such objects into four types: natural phenomena, artificial phenomena, artificial space objects, natural space objects (which include outer space and celestial bodies as separate spatial-territorial units).

Furthermore, considering a large number of scientific discussions on the topic of determining the status of "space objects" and "spacecraft" and responsibility for their operation, this study proposes introducing several new terms to solve this problem, namely the term "Cosmic artificial object" and the term "pre-Cosmic artificial object" as well as interpretations of these terms.

To summarize this study, it is safe to say that in 1958-1963 a gradual and confident process of formation of one of the above legal systems, namely Outer Space Public Law, began.

Given the unique environment for which Outer Space Public Law was developed, the sources of this law initially took on a non-standard form, a kind of *Conventionalis stipulatio* (joint public promise) set out in the form of Resolutions and Declarations of the General Assembly of the United Nations or the form of other similar official documents.

However, even in the format of such *Conventionalis stipulatio*, the international community managed to develop the first four most important General Principles for Space Activities: The Principle of Free Cosmos, The Principle of Peaceful Cosmos, The Principle of Useful Cosmos, The Principle of Cosmos Traffic (which consists of the following three specific principles: The Principle of registration of launches, The Principle of mutual assistance, and The Principle of responsibility).

It is these principles that may in the future become the basis for the development of Outer Space Public Law aimed at the benefit of all humanity.

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НОВИЙ ПОГЛЯД НА РЕГУЛЮВАННЯ КОСМІЧНОЇ ДІЯЛЬНОСТІ: ВІД ВИТОКІВ ДО СУЧАСНОСТІ

У дослідженні висвітлено нові погляди на регулювання космічної діяльності, які сформовано на основі синтезу інноваційних підходів до регулювання такої діяльності та аналізу документів, прийнятих міжнародною спільнотою у цій галузі за весь період розвитку космічної діяльності. Насамперед у дослідженні порушено питання про формат наявного Космічного права (зокрема у вигляді *Conventionalis stipulatio*), а також висунуто питання про можливість появи в майбутньому кількох нових правових систем регулювання космічної діяльності. У зв'язку з цим наново переглянуто перелік суб'єктів та об'єктів космічної діяльності та космічного права, а також запропоновано варіанти їхньої класифікації та нової інтерпретації. Крім цього, на поточному етапі дослідження подано пропозицію із застосування нового підходу до організації правового простору Всесвіту з урахуванням принципів «домашньої кімнати» та «чужої кімнати». Водночас така пропозиція також включає застосування нових методів для визначення просторово-територіальної юрисдикції держав. Так, замість пошуків кордону між повітряним та космічним просторами (які досі не увінчалися успіхом) розглянуто питання про можливість поділу всього повітряно-космічного простору на декілька спеціальних шарів: шар просторової безпеки держав, шар просторової безпеки людства та відкритий Космос. Додатково у дослідженні звернуто окрему увагу на поступове формування у період 1958-1963 рр. перших чотирьох найважливіших Загальних Принципів Космічної Діяльності, які у майбутньому можуть стати основою створення Космічного Публічного Права, спрямованого на благо всього людства. На думку автора статті, результати цього дослідження дадуть змогу сформулювати новий погляд на процес регулювання космічної діяльності та запропонувати нові форми та види Космічного права, що дадуть змогу змінити міжнародну ситуацію в цій галузі на краще.

Ключові слова: космос, космічне право, космічна діяльність, принципи, суб'єкти, об'єкти, юрисдикції