

Artemis Accords and the Future of Space Governance: Intentions and Reality

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The article is devoted to the study of the leading positions and principles of Artemis. We are going to consider 13 provisions, including purpose and scope, implementation, peaceful purposes, transparency, interoperability, emergency assistance, registration of space objects, publication of scientific data, preservation of space heritage, space resources, space de-conflict. Actions, Orbital Debris, and Final Provisions. The article opted for exploratory research using an open, grounded theory approach, including regulations, abstracts of international conferences. The data was supplemented by legal documents, including materials from laws, acts and contracts. In this article, we will learn about the leading role of the Artemis Agreement for the signatory countries and why further agreements between the signatories and the United States are so important. The article explores the principle of adaptive management, which began to develop rapidly thanks to Artemis Accords, and its implications for international cooperation. The use of space resources in terms of the Artemis Agreement is also being analyzed, as today we see some differences between the provisions on innovation of the Artemis Agreement and the Outer Space Treaty. This article examines the compliance of Artemis Accords with international law and international standards, as its main purpose is to confirm the willingness of the signatory countries to work together on the basis of established principles.

Keywords: Artemis Agreement, United Nations Office for Outer Space Affairs, European Space Agency, NASA, Outer Space Treaty, Moon Agreement, exploitation of natural resources.

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Introduction

Artemis is a NASA program in cooperation with private companies and space agencies, including the European one, for the development of manned space flights. This program was named after the eponymous U.S. lunar exploration program. The main objectives of such a program are to establish and implement a form of basic principles of research and economic activity in outer space, implement the provisions of the Outer Space Treaty and other relevant international instruments and thereby establish a political understanding regarding mutually beneficial practices for future exploration and use of outer space, with a focus on activities conducted in support of the Artemis Program. The program operates based on agreements on the principles of cooperation in public research and the use of the Moon, Mars, comets, and asteroids for peaceful purposes. The Artemis Accords are part of the Artemis Program led by the U.S. National Aeronautics and Space Administration (NASA). A distinctive trait of the Artemis Program is that it envisages the construction of a permanent outpost on the Moon, which includes a dedicated orbital station (the lunar “Gateway”) and a self-sustaining lunar base (the Moon Base Camp). To implement the Artemis Program, NASA is seeking the international collaboration of States and commercial partners. To that intention, it has elaborated a set of guidelines that will form an integral part of any subsequent agreement with international partners. In practice, states wishing to enter into collaboration with NASA must commit in advance to abide by the principles outlined in the Artemis Accords (Deplano, 2021).

Artemis Accords were signed on 13 October 2020 at the 71st International Congress of Astronautics by the following countries: USA, Australia, Canada, Japan, Luxembourg, Italy, Great Britain, and the United Arab Emirates (Artemis, 2020). One month later, Ukraine joined them (Ukraine, 2020). As of June 2021, 12 countries have embraced the Artemis Accords: Australia, Brazil, Canada, Italy, Japan, Luxembourg, New Zealand, the Republic of Korea, Ukraine, the United Arab Emirates, the United Kingdom, and the United States (International, 2021). On 22 October 2020, a webinar was held on the topic “The Artemis Accords and the Future of Space Governance: Volume II” (Artemis Accords, 2020).

Melissa de Zwart notes that the Artemis project will rely heavily on the involvement of commercial space operators, and other states are invited to become part of the project through relevant space agencies. However, participation depends on the adoption and adherence to the Artemis Agreements, reflecting “a shared vision of the principles based on the 1967 Outer Space Treaty to create a safe and transparent environment conducive to exploration, science, and business for all mankind to enjoy”. Melissa de Zwart writes that the principles underlying the Artemis Agreements are crucial in the context of international space law, in particular the rules applicable to the use of space resources and territoriality, through the application of the contested “zone” principle. Artemis agreements are an important step forward in international space rights (de Zwart, 2021).

The normative character of the Artemis Accords

Artemis Accords affirming the importance of compliance with the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, opened for signature on 27 January 1967 (Treaty, 1967) as well as the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, opened for signature on 22 April 1968 (Agreement, 1968), the Convention on International Liability for Damage Caused by Space Objects, opened

for signature on 29 March 1972 (Convention, 1972), and the Convention on Registration of Objects Launched into Outer Space, opened for signature on 14 January 1975 (Registration, 1975); as well as the benefits of coordination via multilateral forums, such as the United Nations Committee on the Peaceful Uses of Outer Space (Committee, 2020), to further efforts toward a global consensus on critical issues regarding space exploration and use.

Paragraph 2 of Section 13 “Final Provisions” states that the government of the United States of America will maintain the original text of Artemis Accords and transmit to the Secretary-General of the United Nations a copy of these Accords, which is not eligible for registration under Article 102 of the Charter of the United Nations, with a view to its circulation to all the members of the Organization as an official document of the United Nations. This provision means that the Agreement will not be registered following paragraph 1 of Article 102 of the UN Charter. Therefore, none of the parties to the Agreement will be able to refer to it in any of the U.N. bodies. Thus, the United States does not entrust the U.N. with the functions of the depositary of the Agreement. This fundamentally distinguishes the Artemis Agreement from the four main international legal acts on which the space powers of the world are guided in their activities. These are the Space Treaty, the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (1968), the Convention on International Liability for Damage Caused by Space Objects (1972), the Convention on the Registration of Objects Launched into space (1975). The depositary of all four documents is the U.N. However, in the case of the Artemis Agreement, the United States, as the depositary, will keep the original texts of the agreements, verify that all signatures, documents, and notices related to the Agreement are in order, and inform the states that have the right to become parties to the Agreement.

The guiding principles of the Artemis program are peaceful activities, transparency, interoperability (functional interaction), emergency assistance, spacecraft registration, publication of scientific data, preservation of space heritage, extraction of space resources, conflict prevention, and counteraction to the formation of space. The Artemis Agreement does not contain a reference to the Agreement on the Activities of States on the Moon and Other Celestial Bodies (1984), as the United States did not sign. However, on 6 April 2020, Donald Trump signed the order to support the commercial extraction of resources on the Moon and other celestial bodies. The U.S. position on the possibility of appropriating space resources is constant and unchanging, and the United States seeks to extend this approach to other countries (Wall, 2020).

The structure and content of the Agreement is a protocol of intent. This is evidenced by the absence of essential terms of the contract: the distribution of responsibilities of the parties, the specific subject of the contract, the term of the contract, the order of transfer or distribution of results, financial obligations of the parties, intellectual property rights to objects manufactured during the contract, responsibilities of the parties and the procedure for resolving disputes and others.

Section 1, “Purpose and Scope,” states that the purpose of these Accords is to establish a common vision via a practical set of principles, guidelines, and best practices to enhance the governance of the civil exploration and use of outer space to advance the Artemis Program. Adherence to a practical set of principles, guidelines, and best practices in carrying out activities in outer space is intended to increase the safety of operations, reduce uncertainty, and promote the sustainable and beneficial use of space for all humankind. Section 2 – Implementation means that cooperative activities regarding the exploration and use of outer space may be

implemented through appropriate instruments, such as Memoranda of Understanding, Implementing Arrangements under existing Government-to-Government Agreements, Agency-to-Agency arrangements, or other instruments. Section 3 – Peaceful Purposes means that the signatories affirm that cooperative activities under these Accords should be exclusively for peaceful purposes and follow relevant international law. International cooperation on Artemis is intended not only to bolster space exploration but to enhance peaceful relationships between nations. Therefore, at the core of the Artemis Accords is the requirement that all activities will be conducted for peaceful purposes, per the tenets of the Outer Space Treaty. Per Section 4 – Transparency, the Signatories are committed to transparency in the broad dissemination of information regarding their national space policies and space exploration plans under their national rules and regulations. Transparency is a key principle for responsible public space exploration and NASA has always taken care to publicly describe its policies and plans. Artemis Accords partner nations will be required to uphold this principle by publicly transparently describing their policies and plans. Interoperability of systems is critical to ensure safe and robust space exploration. Therefore, the Artemis Accords call for partner nations to utilize open international standards, develop new standards when necessary, and strive to support interoperability to the greatest extent practical. Section 5 Interoperability states that the signatories recognize that the development of interoperable and common exploration infrastructure and standards, including but not limited to fuel storage and delivery systems, landing structures, communications systems, and power systems, will enhance space-based exploration, scientific discovery, and commercial utilization. The Signatories commit to using reasonable efforts to utilize current interoperability standards for space-based infrastructure, to establish such standards when current standards do not exist or are inadequate, and to follow such standards. Providing emergency assistance to those in need is a cornerstone of any responsible civil space program. Therefore, the Artemis Accords reaffirm NASA's and partner nations' commitments to the Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space. Additionally, under the Accords, NASA and partner nations commit to taking all reasonable steps to assist astronauts in distress. Section 6 – Emergency Assistance states that the signatories commit to taking all reasonable efforts to render necessary assistance to personnel in outer space who are in distress and acknowledge their obligations under the Rescue and Return Agreement. The issue concerning the registration of space objects is highlighted in Section 7. This section states that for cooperative activities under these Accords, the Signatories commit to determine which of them should register any relevant space object following the Registration Convention. For activities involving a non-Party to the Registration Convention, the Signatories intend to cooperate to consult with that non-Party to determine the appropriate means of registration. Registration is at the core of creating a safe and sustainable environment in space to conduct public and private activities. Without proper registration, coordination to avoid harmful interference cannot take place. The Artemis Accords reinforce the critical nature of registration and urge any partner who is not already a member of the Registration Convention to join as soon as possible. NASA has always been committed to the timely, full, and open sharing of scientific data. Artemis Accords partners will agree to follow NASA's example, releasing their scientific data publicly to ensure that the entire world can benefit from the Artemis journey of exploration and discovery. Section 8 – Release of Scientific Data states that signatories reserve the right to report and publish information to the public on their activities. Signatories must coordinate with each other in advance on the public disclosure of information concerning other

signatories' activities, and signatories must openly exchange scientific data. However, such obligations regarding the open exchange of scientific data do not apply to the private sector, unless such transactions are conducted on behalf of a Signatory to the Agreements. Therefore, Section 8 stipulates that open data sharing obligations do not apply to private sector activities unless such transactions are conducted on behalf of a party to the Agreement. The Agreement does not prevent the signatory states from involving private entities in fulfilling the terms of further agreements. On the one hand, the Agreement does not contain direct bans on attraction, and on the other hand, the United States is the flagship of space activities at the national level based on public-private partnership. Therefore, by opening the Artemis Agreement for signing, the United States is trying to show its counterparts the urgency and economic justification. The United States has already involved several private companies in the Artemis Program, such as Blue Origin, Dynetics, Lockheed Martin, and SpaceX. Protecting historical sites and artifacts will be just as important in space as it is here on Earth. Therefore, under Artemis Accords agreements, NASA and partner nations will commit to the protection of sites and artifacts with historic value According to Section 9 – Preserving outer space heritage. The signatories intend to preserve the space heritage, which they believe includes historically significant human or robotic landing sites, artifacts, spacecraft, and other evidence of activity on celestial bodies following mutually developed standards and practices. The signatories to the Convention intend to use their experience under the Agreements to promote multilateral efforts to further develop international practices and rules applicable to the preservation of space heritage (Artemis, 2020).

We should admit that in the Outer Space Treaty, there is no provision under which the concept of space heritage neatly falls. The closest provision is Article 7, paragraph 3, of the Moon Agreement. It reads: “States Parties shall report to other States Parties and to the Secretary-General concerning areas of the Moon having a special scientific interest so that, without prejudice to the rights of the other States Parties, consideration may be given to the designation of such areas as international scientific preserves for which special protective arrangements are to be agreed upon in consultation with the competent bodies of the United Nations” (Agreement, 1984). It should be understood that in the case of the creation of international scientific reserves does not violate the principle of free research and use of celestial bodies, then the creation of international historical and cultural reserves is carried out by analogy. According to Clause 2 of Section 9 of the Artemis Agreements, the signatory states must work to preserve the heritage, which in practice involves the creation of a security zone. It should be noted that the main difference between the creation of a safety zone to facilitate the use of natural resources of celestial bodies and the creation of a safety zone to protect human heritage in space is that the latter will create a zone of deconfliction to prevent damage to landings and idle facilities. such as artifacts, not people (Agreement, 1984).

The issue of space resources is highlighted in Section 10. Vladymir Tolstykh has noted that in the past few years, the situation related to the exploration and use of space had changed dramatically and it had been proven that the extraction of space resources could be profitable; there was a gap between the state of the space industry in the United States and other countries. These changes resulted in a US-initiated reform aimed at legalizing the appropriation of extracted space resources, as well as, in the long term, at legalizing the appropriation of sites of celestial bodies and resources in situ by both individuals and states. Its instruments are proposals for the reinterpretation of key agreements, new U.S. and Luxembourg law and the Artemis Accords signed on 13 October 2020. As a result, we can talk about the emergence

of an international custom that legalizes the appropriation of extracted resources (Tolstykh, 2021).

Accordingly with block 5 of Building Blocks for the Development of an International Framework on Space Resource Activities states bear international responsibility for national space resource activities, whether such activities are carried out by governmental agencies or non-governmental entities, and for ensuring that such activities are carried out in conformity with the international framework; non-governmental space resource activities shall require prior authorization and continuing supervision by the appropriate State; when space resource activities are carried out by an international organization, responsibility for compliance with the international framework shall be borne by the international organization and by the States participating in such organization. Block 8 highlights the main provisions concerning resource rights. Following this block, the international framework should ensure that resource rights over raw mineral and volatile materials extracted from space resources, as well as products derived therefrom, can lawfully be acquired through domestic legislation, bilateral agreements, and/or multilateral agreements. Also, the international framework should enable the mutual recognition between States of such resource rights. The international legal framework should ensure that the utilization of space resources is carried out under the principle of non-appropriation under Article II OST1 (Building, 2019).

Per the Artemis Accords, the signatories note that the use of space resources can benefit humanity by providing critical support for safe and sustainable operations. The Signatories emphasize that the extraction and use of space resources, including any recovery from the surface or underground surface of the Moon, Mars, comets, or asteroids, should be carried out in a manner consistent with the Outer Space Treaty and support of safe and sustainable space activities. The Signatories affirm that the extraction of space resources does not inherently constitute national appropriation under Article II of the Outer Space Treaty and that contracts and other legal instruments relating to space resources should be consistent with that Treaty. The Signatories commit to informing the Secretary-General of the United Nations as well as the public and international scientific community of their space resource extraction activities per the Outer Space Treaty. The Signatories intend to use their experience under the Accords to contribute to multilateral efforts to further develop international practices and rules applicable to the extraction and utilization of space resources, including through ongoing efforts at the COPUOS. Interestingly, neither the Artemis Agreement nor the Outer Space Treaty contains direct prohibitions on the establishment of ownership of space resources. This means that the general recognition by all signatories of the legality of exploitation and subsequent recognition of the right of ownership of space resources is a kind of legal precondition for participation in the Artemis Program. It is noteworthy that the three signatory states to the Agreement have settled in advance the issue of commercial extraction of minerals on celestial bodies. These are the United States (U.S, 2015), Luxembourg (Loi, 2017), and the UAE (Law, 2019). It should be noted that Australia is currently the only signatory to the Artemis Agreement, which is also a signatory to the Agreement on the Activities of States on the Moon and Other Celestial Bodies (Agreement, 1979). St. Article 11 of this Agreement establishes that the Moon and its natural resources are the common heritage of mankind and that the Moon's subsoil, parts of its surface or subsoil or natural resources, where they are located, may not be owned by any State, international intergovernmental or non-governmental organization, national organization or non-governmental institution or any individual.

Avoiding harmful interference is an important principle of the Outer Space Treaty which is implemented by the Artemis Accords.

Section 11 Deconfliction of Space Activities, in our opinion, is quite contradictory. We should admit that the concept of a safety zone is not mentioned in the Outer Space Treaty, and its introduction in Section 11 of the Artemis Accords represents a genuine innovation. According to Section 11, the Signatories affirm that the exploration and use of outer space should be conducted with due consideration to the United Nations Guidelines for the Long-term Sustainability of Outer Space Activities adopted by the COPUOS in 2019, with appropriate changes to reflect the nature of operations beyond low-Earth orbit. Following Article IX of the Outer Space Treaty, a Signatory authorizing activities under these Agreements must adhere to the principle of due diligence. The Signatories shall not have the right to engage in activities that could adversely interfere with the use of outer space in the activities of the other Party. The activity of one party is related to the activity of the other party. To fulfill their obligations under the Outer Space Treaty, the Parties shall submit information on their activities and coordinate with the relevant entity to avoid harmful interference. The area in which this communication and coordination will be implemented to avoid harmful interference is called the “safety zone.” Specifically, via the Artemis Accords, NASA and partner nations will provide public information regarding the location and general nature of operations which will inform the scale and scope of “Safety Zones.” The safety zone must be the zone in which the initial operations of the activity concerned or the abnormal event may reasonably cause harmful interference. During their activities, signatories must adhere to certain rules of this security zone, namely: the size and scope of the security zone must reflect the nature of the operations carried out, must be determined reasonably in the light of engineering and scientific principles. In the event of a change like the activity, the size and scope of the relevant security zone should change. The signatory during the creation, maintenance, or completion of the security zone must do so in such a way as to protect public and private personnel, equipment from harmful interference. Notification and coordination between partner nations to respect such safety zones will prevent harmful interference, implementing Article IX of the Outer Space Treaty and reinforcing the principle of due regard.

However, the question arises whether the security zones will not turn into attempts to establish national sovereignty on celestial bodies or their occupation, which is prohibited by Art. 2 of the Space Treaty. After all, in practice, there may be a situation where Entity 1 establishes an appropriate security zone in a part of a celestial body, in which case the free access of Entity 2 to that part may be regarded by Entity 1 as a harmful interference with its use of outer space. At the same time, Entity 1 can, in practice, engage in space activities in the same area of the celestial body for a long time, building the necessary infrastructure for the life and work of its personnel. The time for space activities is not set. Thus, if during this period the legislation on the Earth changes and the Space Treaty in certain circumstances loses force or the corresponding changes will be made to it, Entity 1 can get the property rights to the constructions and buildings located there, without acquiring at this ownership of the land beneath them (Richards, 2017).

In 2016, such a concept was discussed by the Hague Working Group on Space Resources Management. As a result, in 2019, the Building Blocks for the Development of an International Framework on Space Resource Activities were developed and agreed upon. According to these developments, it is not legitimate to double-interpret the very concept of “security zones” and the obligations to operate in them, the requirements for

security measures in such zones (block 11.3), and appropriate international consultations on their establishment (block 11.4) should be appropriate level (Building, 2019).

The issue concerning orbital debris is highlighted in Section 12. Preserving a safe and sustainable environment in space is critical for both public and private activities. NASA and partner nations will agree to plan for the mitigation of orbital debris, including the safe, timely, and efficient passivation and disposal of spacecraft at the end of their missions. The Signatories commit to planning for the mitigation of orbital debris, including the safe, timely, and efficient passivation and disposal of spacecraft at the end of their missions, when appropriate, as part of their mission planning process. In the case of cooperative missions, such plans should explicitly include which Signatory has the primary responsibility for the end-of-mission planning and implementation. The Signatories commit to limit, to the extent practicable, the generation of new, long-lived harmful debris released through normal operations, break-up in operational or post-mission 7 phases, and accidents and conjunctions, by taking appropriate measures such as the selection of safe flight profiles and operational configurations as well as post-mission disposal of space structures (Artemis, 2020).

Section 13 includes Final Provisions, which means that building on any consultative mechanisms in preexisting arrangements as appropriate, the Signatories commit to periodically consult to review the implementation of the principles in Accords, and to exchange views on potential areas of future cooperation (Artemis, 2020).

For the sake of exposition, the provisions of the Artemis Accords can be grouped into three categories. The first category simply transposes provisions of the Outer Space Treaty into the text of the Artemis Accords. The second category implements provisions of the Outer Space Treaty, adding detail and clarity to the rights and obligations contained therein. The third category introduces new concepts. The explicit commitment of the signatories to operate within the boundaries of the Outer Space Treaty's principles makes the content of the Artemis Accords relatively uncontentious. However, closer scrutiny reveals that certain provisions of the Artemis Accords go a step further than mere implementation, effectively introducing concepts and principles not mentioned in the Outer Space Treaty, thus raising issues of compatibility (Deplano, 2021).

Rossana Deplano divided the provisions of the Artemis Accords into three types. The first type includes verbatim transpositions of provisions of the Outer Space Treaty into the text of the Artemis Accords. For instance, Section 3 of the Artemis Accords states that any activity carried out by the signatories shall be exclusively for peaceful purposes, thus replicating the provision contained in article IV, paragraph 2, of the Outer Space Treaty². The second type consists of provisions that cite articles of the Outer Space Treaty instead of replicating their content. For example, Section 4 of the Artemis Accords requires the signatory States to share scientific information resulting from their space activities with the public and the scientific community on a good faith basis and consistent with Article XI of the Outer Space Treaty – that is to say, providing the details of the nature, conduct, and locations of such activities (Deplano, 2021).

The third type includes provisions of the Artemis Accords loosely related to the text of the Outer Space Treaty but grounded on international law instruments. For example, Section 4 of the Artemis Accords requires the signatory States to adopt standards that will ensure the interoperability of any infrastructure used for space-based exploration. The provision reflects established practice in the field of international cooperation in outer space, dating back to the historic docking of the joint Apollo-Soyuz mission in 1975 (Deplano, 2021).

In our opinion, the advantage of the Artemis agreement is the spread beyond the United States of the already successful scenario of public-private partnership in space activities, promoting the commercialization of such activities by involving international partners and private entities. It is the United States that is responsible for building new diplomatic bridges between the states that have been engaged in space activities only recently, as well as those states that have previously had no precedent for interaction with each other in the space sector. The signing of the Artemis Agreement is important for the signatory countries due to further cooperation in the study and use of outer space for peaceful purposes.

An interesting question is whether the signatories agree to be bound by the Agreement. For example, following paragraph 1 of Art. 9 of the Constitution of Ukraine, part of the national legislation of Ukraine are those international treaties, the binding nature of which was approved by the Verkhovna Rada of Ukraine. At the same time, paragraph 2 of Article 9 of the Law of Ukraine “On International Treaties of Ukraine” stipulates that political treaties are subject to ratification in particular. In this context, it should be recalled: Section 1 of the Agreement itself declares that accession to the Agreement constitutes a political commitment to the principles described therein, and Section 13 does not provide direct guidance on how States may agree to be bound by the Agreement, in addition to the actual indication of the accession mechanism in the form of a signature in addition to the text of the U.S. Government Agreement.

Conclusion

Accession to the Artemis Accords is a significant step for the signatory countries, which allows them to fully demonstrate all the accumulated technical potential. Further agreements, which will be concluded between the two parties and will clearly define their rights and obligations in the framework of such cooperation, will be crucial for cooperation between the signatories and the United States in the deep space program. As for the role of the Artemis Accords in establishing relations between space powers, its main purpose is to confirm the readiness of contractors to joint activities based on the principles set out in the Agreement.

The Artemis Accords are not binding in nature, but the overriding goal is to ensure top priorities in space activities. The Artemis Accords took into account the obligations of the Outer Space Treaty, as it is an international basis for cooperation. It should be noted that the Artemis Accords provide a starting point for further discussion of the international framework for space activities, as they encourage and facilitate the fulfillment of space commitments. Important in the study of Artemis agreements is that they are fully developing the principle of adaptive governance, which is extremely important today for international cooperation.

The issue of space exploitation is becoming important today, and this process is gaining in importance and becoming inevitable, contrary to the provisions of the Moon Agreement of 1979. Therefore, provisions of the Artemis Accords are innovative, moving towards development issues of space resources exploitation, but need further improvement.

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