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# Examining the evolution of space law and the position of the Artemis Agreement

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**Abstract:** The rapid advancement of technology across various domains, including outer space, has compelled states to continually update and refine treaties and regulatory frameworks governing space activities. Notable examples include the U.S. Space Resource Exploration and Utilization Act of 2015, the Luxembourg Space Resources Act of 2017, and, most recently, the Artemis Accords, ratified by 32 countries in October 2020. The Artemis Accords are integral to the broader Artemis program, spearheaded by the U.S. National Aeronautics and Space Administration (NASA). This study investigates whether the Artemis Accords can exert a transformative influence on the development of international space law. Employing a documentary (library-based) research methodology, the article critically examines the compatibility of the Artemis Accords with existing international legal frameworks, including the Outer Space Treaty (1967) and the Moon Agreement (1979). The findings indicate that, while the Accords are grounded in the principles of the Outer Space Treaty, they introduce a substantive innovation in international space law by shifting from a prescriptive regulatory approach toward a more facilitative framework for space activities.

**Keywords:** *Moon exploration, Artemis Accords, space rights, outer space, space activities, space treaties*.

**Cite this Article**

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## Introduction

In October 2020, eight countries—Australia, Canada, Italy, Japan, Luxembourg, the United Arab Emirates, the United Kingdom, and the United States—signed the **Artemis Accords** (hereinafter referred to as the Agreement). The Agreement, comprising thirteen articles, seeks to facilitate international cooperation in the exploration, utilization, and development of space projects. To date, **32 countries** have ratified the Agreement.

The primary objective of the Artemis program is to land the first woman and the second man on the Moon by 2024, thereby laying the foundation for future exploration missions to Mars and other celestial bodies within the solar system. A distinguishing feature of this initiative is the construction of a **permanent lunar presence**, encompassing a dedicated orbital station, referred to as **"Moongate,"** and a self-sustaining base on the lunar surface, termed **"Camp Base on the Moon."** Realizing this vision necessitates substantial economic investment, deployment of advanced technological solutions, and utilization of lunar resources to construct and maintain human settlements.

To implement the Artemis program, NASA actively seeks collaboration with other nations and commercial partners. Practically, countries that wish to cooperate with NASA are required to commit to adhering to the principles and norms set forth in the Agreement. This raises a critical research question: **Can the Artemis Accords influence the development of international space law?** The central hypothesis of this study posits that the Agreement reflects and operationalizes key provisions of both the **Outer Space Treaty (1967)** and the **Moon Agreement (1979).**

This study examines two interrelated perspectives on the legal concepts embedded within the Agreement. Specifically, it aims to analyze the **content and scope** of the Artemis Accords in relation to existing international legal frameworks and assess its potential impact on the **multilateral lawmaking process governing outer space activities**. The research methodology employed is **descriptive-analytical**, facilitating a systematic evaluation of the Agreement's alignment with established international norms and its implications for future space governance.

## Background

A substantial body of literature has been produced on the field of outer space law in both Persian and English. Notable works include ***Iran and International Space Law*** by Seyed Sanaz Zabihi Shahri and Ahmad Momani Rad (2022), which addresses the evolution of space law and Iran's position in the field (Momeni Rad & Zabihi

Shahri, 2022: 13). Similarly, ***A Treatise on Space Law*** by Seyyed Mohammad Hosseini (2014) dedicates its seventh chapter to the Moon and the principle of the **common heritage of humanity** (Hoseini, 2015: 251–266).

In addition, the article **"Space Grand Strategy in the Light of International Relations Theory"** by Gulareh Rastgarnia, Afshin Zargar, and Fakhraldin Soltani (2021) analyzes the evolution of international politics and its impact on outer space governance (Rastegarnia, Zargar, Soltani, 2021: 163–181). Furthermore, Leila Raisi's 2023 study, **"Protecting Civil Rights in Cyberspace in the Light of the Third Generation of Human Rights with an Emphasis on Iranian Rights"**, discusses the concept of the common heritage of humanity, which explicitly includes outer space (Raisi, 2024: 53).

Despite these contributions, previous studies have not adequately addressed the need for new agreements that integrate contemporary technological advancements with the evolving legal regime governing space rights. The **Artemis Agreement** fills this gap by incorporating elements of the Outer Space Treaty and the Moon Agreement, providing innovative legal frameworks for space activities—a dimension not explicitly examined in earlier research. This article, therefore, contributes a **novel perspective** to the discourse on international space law.

# Conceptual Framework

Outer space, defined as the region beyond Earth, holds a **unique and exceptional legal status** and is recognized as the **common heritage of humanity**. This status necessitates continuous development of treaties and agreements to ensure its protection, both geographically and legally.

Control over orbital paths, strategically significant locations in outer space, and access to exploitable natural resources offers states significant opportunities to **acquire, maintain, and expand geopolitical and technological power** (Rastegarnia, Zargar, Soltani, 2021: 166). Historically, international treaties such as the **Outer Space Treaty (1967)** and the **Moon Agreement (1979)** emerged in response to technological developments in space exploration. However, the **rapid advancement of space technology** combined with geopolitical competition has created a pressing need for **new legal instruments** that can regulate power dynamics, ensure compliance, and maintain a competitive balance among technologically advanced nations.

The Artemis Agreement represents a contemporary response to this need, integrating previous legal principles while introducing mechanisms to manage and guide state activities in outer space, thus reflecting the evolving relationship between technology, law, and international power structures.

# History

Over the past decades, unmanned missions and other space activities—including the construction and launch of rockets, satellites, planetary explorers, and space navigation systems—have highlighted the urgent need for a legal framework governing the extraction of extraterrestrial resources.

The **Commercial Space Launch Competitiveness Act of 2015** allows private companies and U.S. citizens to engage in mining activities on celestial bodies, including the Moon. Notably, this legislation applies exclusively to U.S. entities (Lavayee, 2021: 8). In a similar vein, Luxembourg enacted the **Space Mining Law** in 2017, aimed at reducing regulatory barriers for private companies engaging in space resource extraction. Following this legislation, Luxembourg signed several bilateral agreements to enhance international cooperation in space mining.

For instance, in November 2017, Luxembourg entered into a five-year agreement with Japan to exchange information on space resource extraction and to collaborate on future projects. Similar agreements were concluded with Portugal and the United Arab Emirates. In March 2019, Luxembourg expanded its international framework by negotiating a space mining agreement with Russia, thus integrating additional global powers into its space resource governance initiatives (Lavayee, 2021: 9). These legislative and diplomatic measures laid the foundational framework for the subsequent development and conclusion of the Artemis Agreement.

**Main Features of the Artemis Accords**

The **Artemis Accords** were formulated to operationalize and implement the principles enshrined in the **Outer Space Treaty** (Artemis Accords, 2020: Preamble, Para. 10). The agreement provides **guidelines and best practices** encompassing:

- International cooperation and transparency in space activities
- Peaceful utilization of outer space
- Assistance to astronauts in distress
- Registration of space objects
- Dissemination of scientific information
- Protection of space heritage
- Utilization of space resources
- Non-discrimination in space activities
- Sustainable exploration of celestial bodies by humans (Artemis Accords, 2020: Preamble, Para. 5).

It is important to note that the Artemis Accords are **not legally binding** (Artemis Accords, 2020: Preamble, Para. 10; Section 13). For analytical purposes, the provisions of the Accords can be categorized into three groups:

1. **Clarification of Existing Terms** – provisions that refine or reinterpret terms from the Outer Space Treaty in the context of this agreement.
2. **Operational Implementation** – provisions that translate treaty terms into practical rights and obligations, facilitating compliance with Article 31 of the Vienna Convention on the Law of Treaties regarding treaty interpretation.
3. **Introduction of New Principles** – innovative concepts and norms not previously codified in international space law.

The subsequent sections of this study examine these three categories sequentially. First, the provisions are compared with the Outer Space Treaty and other relevant international legal instruments. Second, the operational implementation of these provisions is analyzed, including their compatibility with established treaty rights. Finally, the novel principles introduced in the Artemis Accords are critically evaluated in the context of international space governance.

## Integration of International Law Provisions

The provisions of the Artemis Agreement, which integrate elements of the **Outer Space Treaty** and other international instruments, can be categorized into three distinct types.

**The first type** entails the verbatim incorporation of Outer Space Treaty provisions into the text of the Agreement. For instance, **Section III** stipulates those activities conducted by the signatories must be "exclusively for peaceful purposes," directly reflecting **Article IV, Paragraph 2** of the Outer Space Treaty, which is similarly reiterated in **Article 3 of the Moon Agreement** (Hoseini, 2015: 250; Outer Space Treaty, 1967: Article IV, Para. 2). Similarly, **Section VI** mandates that signatories provide assistance to astronauts in distress, mirroring **Article V of the Outer Space Treaty**.

**The second type** includes provisions that reference the Outer Space Treaty without reproducing its text. For example, **Section IV** requests that signatories make scientific information from their space activities available to the public and the scientific community in good faith, consistent with **Article XI of the Outer Space Treaty**, which obliges states to provide information about the details, location, and methods of their space activities (Outer Space Treaty, 1967: Article XI).

**The third category** reflects provisions that have a weaker textual connection to the Outer Space Treaty but remain grounded in international law instruments. For example, **Section IV** requires signatories to adopt standards ensuring the interoperability of infrastructure used in space exploration, reflecting established international cooperative practices dating back to the **Apollo-Soyuz Test Project (1975)** (Lebedev & Romanov, 1979: 40). Similarly, **Section V** mirrors **Article V, Section 2** of the Outer Space Treaty by mandating that astronauts render all possible assistance to those of other member states in need. Provisions regarding the registration of space objects (**Section VII**) also indirectly reference **Articles V and VII** of the Outer Space Treaty. Finally, **Section XII** introduces requirements for space debris mitigation programs, consistent with the responsibilities enumerated in **Article IX and Article XI** of the Outer Space Treaty concerning cooperative conduct and shared interests in outer space.

Overall, the provisions of the Artemis Agreement align closely with established international law, while also introducing new operational and practical guidelines.

## Refining the Provisions of International Law

Certain provisions of the Artemis Agreement are designed to implement the obligations established in the Outer Space Treaty by specifying the executive responsibilities of states and other space actors. A critical question arises: **Does the Agreement qualify as a valid instrument for interpreting the Outer Space Treaty under Article 31 of the 1969 Vienna Convention on the Law of Treaties?** This issue is particularly pertinent to **Sections X (Space Resources) and XI (Non-Opposition to Space Activities)**, which align with the Outer Space Treaty in both intent and effect.

- ***Space Resources***

The **Outer Space Treaty (1967)** was adopted when space technology was nascent. Article II explicitly states:

"Outer space, including the Moon and other celestial bodies, may not be appropriated by any means, including sovereignty claims or exploitation."

Over fifty years later, technological advancements have made space resource utilization a practical reality, necessitating more precise regulatory guidance (Danilenko, 2016: 179). The **International Law Commission's Study Group on Treaties Over Time** emphasizes that as treaties age, their operational context evolves, and subsequent practice should adopt a flexible, reasonable, and predictable approach to interpretation (Yearbook of the International Law Commission, 2008: 154).

**Section X of the Artemis Agreement** interprets Article II of the Outer Space Treaty in the context of resource extraction. It states that space resources may be used to **"provide vital support for safe and sustainable operations for the benefit of humanity"**, ensuring scientific results are shared with the public and the research community. This provision is consistent with **Article I of the Outer Space Treaty** and **Article IV, Paragraph 1 of the Moon Agreement**, which emphasizes exploration and utilization in line with the interests of present and future generations (Hoseini, 2015: 255).

Section X further clarifies the concept of **"national ownership"** in the context of Outer Space Treaty obligations. The International Law Commission considers that subsequent practice, if clearly agreed upon by parties, can inform treaty interpretation (UN Doc, 2018: Conclusion 3). In this case, while the Artemis Agreement defines future practices, it **does not amend or modify the Outer Space Treaty**. Instead, signatory states intend to implement the Treaty through bilateral agreements and operational arrangements consistent with its principles.

The Agreement emphasizes two interpretive criteria:

1. **Clarity and specificity of activities:** Section X specifies that space resource extraction must comply with the Outer Space Treaty and that extraction **does not constitute national appropriation**, thereby providing practical guidance on lawful utilization (Artemis Accords, 2020: S10).
2. **Repetition over time:** With 32 ratifying countries, the Agreement forms a foundation for ongoing international cooperation. While not determinative of customary law, it establishes a framework for future bilateral agreements under the Artemis program.

The International Law Commission further notes that silence or lack of consensus among parties does **not constitute acceptance of future activities** as a legal norm (ICJ Rep, 1962: P. 23). Accordingly, Section X **neither reinterprets nor amends Article II of the Outer Space Treaty**, but serves as a guiding instrument for lawful space resource utilization and future cooperative activities.

- ***Non-Interference in Space Activities***

**Section XI** of the Artemis Agreement addresses the principle of non-interference in space activities. Sections III and IV of this Article reference two key principles in **Article IX of the Outer Space Treaty**: first, that states must conduct their space activities with due regard for the interests of other states parties; and second, that states have a duty to refrain from causing harmful interference with the activities of other states.

To operationalize these principles, **Section V of Part XI** obliges signatories to share information concerning the location and nature of their activities and to establish **"safe zones"** to prevent harmful incidents. These zones serve two purposes: (1) facilitating scientific discovery, and (2) supporting safe and efficient resource extraction in accordance with **Section X** of the Agreement, thereby aiding space exploration projects and related operations (Artemis Accords, 2020: S XI).

The concept of safe zones is novel; it is **not explicitly addressed in the Outer Space Treaty**, representing a clear innovation in the Artemis Agreement. Furthermore, **Section II of Part XI** aligns with the **UN Guidelines for the Long-Term Sustainability of Outer Space Activities** (UN Doc, 2019: Annex II).

Paragraph VII of Part XI establishes four principles governing the establishment of safe zones, specifying their scope, duration, and operational oversight, supplemented by information dissemination, progress reporting, and periodic consultations among parties. These provisions are explicit, transparent, and clearly delineate responsibilities, while remaining one of multiple mechanisms to mitigate potential interference.

Consequently, Section XI **does not extend or restrict the obligations under Article IX of the Outer Space Treaty**. Rather, it represents a supplementary or forward-looking interpretation under **Article 31, Paragraph 3 of the Vienna Convention** (UN Doc, 2018: Para. 3). The acceptance of safe zones in broader space law remains a subject for future practice and multilateral endorsement.

## Introduction of a New Concept: Space Heritage Preservation

**Section IX** introduces a novel principle in international space law: the **preservation of outer space heritage**. It states:

"The Signatories intend to preserve the heritage of outer space, including sites of historic human or robotic landings, aircraft, missiles, and other evidence of activities on celestial bodies in accordance with mutually agreed standards."

Existing treaties, including the Outer Space Treaty, do not comprehensively address the protection of space heritage. The **Moon Agreement** (Article VII, Section 3) makes a brief reference to scientific preservation zones on celestial bodies but lacks a defined procedure for designating or managing these areas (Aminzadeh, 2019: 138).

**Paragraph II of Section IX** mandates that contracting states cooperate to develop multilateral laws protecting space heritage. In practice, safeguarding historical sites on celestial bodies requires the creation of **safe zones** to mitigate risks of damage (Hanlon & Cunningham, 2019: 309). Unlike safe zones for resource extraction, heritage zones are designed to **protect historical artifacts and sites**.

Article IX of the Moon Agreement permits the construction of bases but mandates minimal spatial occupation and denies creation of property rights over these areas (Hoseini, 2015: 257). **Outer Space Treaty, Article VIII** recognizes the ownership of launched spacecraft by the state that placed them on celestial bodies. However, historical objects such as the Apollo 11 landing site or Apollo 15 lunar rover tracks are not explicitly addressed, highlighting a regulatory gap.

Section IX of the Artemis Agreement requires states to cooperate in identifying space heritage and establishing criteria for its recognition. Damage to objects of historical significance may trigger state responsibility under the principle of **due regard for the interests of other states**, as articulated in Article IX of the Outer Space Treaty.

Thus, while the concept of space heritage aligns with the Outer Space Treaty's provisions, the existing treaties are insufficient for its effective protection. Section IX of the Artemis Agreement represents a **significant and innovative step** toward codifying the protection of humanity's extraterrestrial heritage.

## The Impact of the Artemis Agreement on the Development of International Space Law

Fundamentally, the Artemis Agreement is grounded in the established principles of international space law, particularly the provisions of the **Outer Space Treaty**. From an innovative standpoint, the Agreement introduces novel applications of these principles. However, formally, it remains largely detached from the **United Nations negotiation process** that governs the development of space law. This section examines the Agreement's influence on the evolution of space law by evaluating whether its adoption process may serve as a new model for lawmaking in outer space.

Historically, in the absence of detailed prior regulations and given the dual-use nature of space technologies, **UN space treaties** were designed to guide state conduct through broad principles to control future space activities (De Man, 2017: 5). These principles inherently provide a predictive framework for space surveillance. However, with globalization and the expansion of space activities, technological and scientific advances have necessitated updating treaty provisions to accommodate new commercial and scientific endeavors.

The emergence of the **private sector** as a primary participant in space exploration has further underscored the need for adaptable frameworks, transforming space from a purely multilateral domain into a platform where states can pursue domestic policies in alignment with international obligations (De Man, 2017: 92). This is particularly evident in the regulation of space resource activities. For instance, the **US Commercial Space Launch Competitiveness Act (2015)** and the **Luxembourg Space Mining Act (2017)** grant property rights to companies engaging in extraterrestrial resource extraction, reflecting national initiatives within the broader multilateral treaty framework (Hobe & De Man, 2017: 7).

Within this context, the Artemis Agreement represents a **hybrid legislative approach**, blending multilateral principles with unilateral national laws. It establishes foundational principles for future bilateral agreements between NASA and other contracting states without prescribing detailed regulatory mechanisms. By doing so, it diverges from the prescriptive approach traditionally employed by UN space treaties. While the Agreement does not introduce fundamentally new international law principles, it provides a practical blueprint for regulating space resource activities and consolidates the phased monitoring of exploitation practices.

Common provisions between the Outer Space Treaty and the Moon Agreement, reflected in the Artemis Agreement, include: peaceful purposes, information dissemination in good faith, interoperability standards, assistance to personnel in distress, registration of space objects, preservation of space heritage, non-appropriation of space

resources, and notification to the **UN Secretary-General** and the international community regarding resource utilization.

The Agreement also introduces new provisions, such as: exemptions from public dissemination of sensitive scientific information, long-term space exploration programs, establishment of safe zones, protection of proprietary data, minimization of debris, and periodic review of bilateral agreements. These provisions reflect a **pragmatic, performance-based approach** to defining rights related to resource extraction, which both influences and is shaped by multilateral discussions on international space law.

For example, **Article 11 of the Moon Agreement** situates economic activities within a framework of shared global interests, emphasizing that celestial resources are the **"common heritage of mankind"** and prohibiting unilateral property claims (Razipour, 2015: 84; Navadeh Toopchi, 2019: 63). Section VI of Part XI of the Artemis Agreement encourages participants to leverage their experiences to contribute to multilateral development of international procedures and standards for safe zones, highlighting a cooperative approach absent from previous treaties. Similarly, Section IX initiates multilateral discourse on the **preservation of space heritage**, supplementing the Outer Space Treaty and Moon Agreement.

Finally, while the Artemis Agreement does not create binding institutions or mechanisms for dispute resolution, it encourages **periodic review and multilateral cooperation**, allowing for incremental evolution. Its provisions, consistent with Article I of the Outer Space Treaty and Articles 4 and 11 of the Moon Agreement, ensure that contracting states—particularly those also party to the Moon Agreement—fulfill their international obligations. Sections IV and IX of the Agreement establish key functions for the international management of space resources, including legal registries, databases of activities, prior notifications, and mechanisms for preserving recognized heritage, thereby reinforcing the principle of **free and unfettered access to space**.

In sum, the Artemis Agreement acts as a forward-looking instrument that complements existing treaties, providing a flexible and practical framework for both the governance of space resources and the protection of humanity's shared heritage in outer space.

## Conclusion

The Artemis Agreement represents a significant international framework for cooperation in human space exploration, reinforcing and operationalizing core commitments of the **Outer Space Treaty**. While not legally binding, the Agreement establishes a principled approach to the conduct of space resource activities, offering guidance where detailed multilateral regulations are absent.

A notable feature of the Artemis Agreement is its facilitation of **Outer Space Treaty compliance**, even in the absence of specific instruments governing the utilization of extraterrestrial resources. By shifting from prescriptive forward-looking regulations to a model based on **adaptive sovereignty**, the Agreement provides a flexible foundation for international collaboration in space governance. This approach creates a structured starting point for further deliberations on the legal framework for international space activities.

Given the current trajectory of space technology, the commercial exploitation of lunar and other celestial resources is increasingly plausible. Consequently, the Artemis Agreement addresses the limitations of the **1979 Moon Agreement**, offering a practical and progressive path toward reconciling commercial interests with international legal principles.

Ultimately, the Artemis Agreement is both innovative and strategic. By operating within the parameters of existing multilateral space treaties, it advances the **evolution of international space law** while preserving its foundational principles, enabling legal development in response to emerging technological and commercial realities.

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