The Artemis Accords as a Tool of Cooperation

Frans G. von der Dunk[*]

Abstract

One of the projects shooting for the Moon attracting the most attention no doubt concerns the Artemis project. Hereby, the US National Aeronautics and Space Administration (NASA) plans to land the first woman and the next man on the Moon, and has meanwhile agreed with other countries on the Artemis Accords with regard to the activities that are to be undertaken on the Moon. While the space agencies assure that the Accords are perfectly in compliance with current international (space) law, some criticism has been levelled against those plans and the Accords disputing that straightforward claim. To assess the validity of such concerns, the paper thus analyses and scrutinizes the thirteen sections of the Accords from the perspective of international law, and in particular its cornerstone principle on international cooperation.

1. Introduction

Among the relatively recent flurry of space activities shooting for the Moon, one of the standout projects concerns NASA's current flagship program Artemis, the female companion to Apollo, which should land the first woman (as well as the next man, at least as far as the United States is concerned) on the Moon by 2024.[1]

Criticisms have been voiced against some elements of the intended lunar activities, as presumably against either the letter or at least the spirit of international cooperation enshrined in the major space treaties – which, given the general lack of acceptance of the 1979 Moon Agreement[2], mainly

* University of Nebraska-Lincoln, College of Law, Space, Cyber and Telecommunications Law Program.

1 See *e.g.* https://www.nasa.gov/specials/artemis/ (last accessed 27 September 2021).

2 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement), New York, done 18 December 1979, entered into force 11 July 1984.

concerns the 1967 Outer Space Treaty[3] and to some extent the three other treaties implementing and detailing some of its key provisions: the 1968 Rescue Agreement[4], the 1972 Liability Convention[5] and the 1975 Registration Convention[6].

At the same time, a major component of the project consists precisely of an effort to promote international cooperation: by way of the so-called Artemis Accords[7], NASA and the space agencies of – currently – eleven other nations have agreed on common principles in the context of Artemis and any related programs of international cooperation on the Moon.[8]

International cooperation indeed is a major principle posited by the Outer Space Treaty. Article I thereof requires that the "exploration and use of (…) the Moon (…) shall be carried out for the benefit and in the interests of all countries (…) and shall be the province of all mankind", and "States shall facilitate and encourage international cooperation" in scientific investigation endeavours there. Article III likewise provides that States shall comply with "international law (…) in the interest of maintaining international peace and security and promoting international cooperation and understanding".

While sometimes efforts were made to interpret this principle of international cooperation as providing for a positive obligation to engage in international cooperative ventures if so requested and/or to share any benefits resulting

3 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (hereafter Outer Space Treaty), London/Moscow/Washington, done 27 January 1967, entered into force 10 October 1967.

4 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (hereafter Rescue Agreement), London/Moscow/Washington, done 22 April 1968, entered into force 3 December 1968.

5 Convention on International Liability for Damage Caused by Space Objects (Liability Convention), London/Moscow/Washington, done 29 March 1972, entered into force 1 September 1972.

6 Convention on Registration of Objects Launched into Outer Space (hereafter Registration Convention), New York, done 14 January 1975, entered into force 15 September 1976.

7 The Artemis Accords – Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes; https://www.nasa.gov/specials/artemis-accords/img/Artemis-Accords-signed-13Oct2020.pdf (last accessed 29 September 2021).

8 See *e.g.* https://en.wikipedia.org/wiki/Artemis_Accords (last accessed 27 September 2021); the nations concerned are Australia, Brazil, Canada, Italy, Japan, Luxembourg, New Zealand, South Korea, Ukraine, the United Arab Emirates and the United Kingdom.

from space activities with other countries, the 1996 Benefits Declaration[9] in its paragraph 2 clearly reiterates the freedom of States "to determine all aspects of their participation in international cooperation in the exploration and use of outer space on an equitable and *mutually acceptable* basis"[10]. Similarly, "[i]nternational cooperation should be conducted in the modes that are considered most effective and appropriate *by the countries concerned*, including, inter alia, governmental and non-governmental; commercial and non-commercial; global, multilateral, regional or bilateral; and international cooperation among countries in all levels of development"[11].

The Artemis Accords, succinctly put, provide for a short-term goal of landing the first woman on the Moon, a mid-term goal of establishing an international expedition team for sustained human presence on the Moon, and long-term goals of laying foundations for a permanent lunar economy to a large extent based on private sector involvement, as well as moving on to Mars.[12] The present paper will provide a summary overview of the thirteen guiding principles offered by the Artemis Accords and the extent to which these have reflected and would be in line with the general goal of international cooperation and, more broadly still, with compliance with international space law.

2. Principle 1: Common Vision

Principle 1 of the Artemis Accords confirms 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 with the intention of advancing the Artemis Program", considered necessary "to increase the safety of operations, reduce uncertainty, and promote the sustainable and beneficial use of space for all humankind". The Accords furthermore "represent a political commitment to the principles described herein", which should guide activities "on the Moon, Mars, comets, and asteroids, including their surfaces and subsurfaces, as well as in orbit of the Moon or Mars, in the Lagrangian points for the Earth-Moon system, and in transit between these celestial bodies and locations".

9 Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of all States, Taking into Particular Account the Needs of Developing Countries (hereafter Benefits Declaration), UNGA Res. 51/122, of 13 December 1996.

10 Emphasis added.

11 Para. 4, Benefits Declaration (*supra* n. 9); emphasis added.

12 *Cf.* also the Preamble to the Artemis Accords (*supra* n.7).

In other words, partnering States' space agencies have to agree to the key principles posited here in order to join the international lunar cooperation effort on Artemis. International cooperation after all might well become a recipe for disputes and conflicts if the underlying assumptions for such cooperation would be rather differently understood by the various participating countries. At the same time, the commitment is *political,* meaning that no legal rights and obligations can be derived directly from the principles; as far as required, those have to be elaborated in further implementing contracts and other arrangements. In that sense, it would indeed merely provide a simple baseline understanding, without as such specific legal ramifications requiring further consideration here.

3. Principle 2: Approach to Implementation

Principle 2 of the Artemis Accords lists the generic, broad approach to implementation of the Artemis Accords further to Principle 1 by way of "Memoranda of Understanding, Implementing Arrangements under existing Government-to-Government Agreements, Agency-to-Agency arrangements, or other instruments. These instruments should reference these Accords and include appropriate provisions for implementing the principles contained in these Accords." The instruments "are expected to contain other provisions necessary to conduct such cooperation, including those related to liability, intellectual property, and the transfer of goods and technical data", and should guarantee that activities are "carried out in accordance with the legal obligations applicable to each Signatory".

As this principle once more focuses on processes rather than substantive obligations – let alone *legal* obligations – it can only be seen as a tool to achieve the desired cooperation: if nothing else, merely confirming the importance thereof under international space law.

4. Principle 3: Peaceful Purposes and International Law

Principle 3 of the Artemis Accords provides: "The Signatories affirm that cooperative activities under these Accords should be exclusively for peaceful purposes and in accordance with relevant international law."

One, obviously, can find little fault with this fundamental repetition of key clauses of the Outer Space Treaty, that "[t]he Moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes"[13], and that, as already quoted, States shall comply with "international law (…) in the interest of maintaining international peace and

13 Art. IV, Outer Space Treaty (*supra* n. 3).

security and promoting international cooperation and understanding"[14]. The only concern here might refer to the precise meaning of 'exclusively for peaceful purposes', although by now general agreement exists that, beyond the quite precise prohibitions of Article IV of the Outer Space Treaty regarding "the *establishment* of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres"[15], the use of substantial armed force would only be allowed anyway in two specific circumstances only: that of self-defence respectively if UN-sanctioned[16].

5. Principle 4: Transparency and Information Dissemination

Principle 4 of the Artemis Accords provides: "The Signatories are committed to transparency in the broad dissemination of information regarding their national space policies and space exploration plans in accordance with their national rules and regulations. The Signatories plan to share scientific information resulting from their activities pursuant to these Accords with the public and the international scientific community on a good-faith basis, and consistent with Article XI of the Outer Space Treaty."
The referenced Article of the Outer Space Treaty provides that States generally should, as part of their supposed general focus on international cooperation, "inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities" for purposes of broad dissemination. In other words, the Principle provides for a general but unequivocal contribution to the cooperative spirit in which space activities are to be undertaken as also per the space treaties.

6. Principle 5: Interoperability and Common Infrastructure

Principle 5 of the Artemis Accords provides: "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 use reasonable efforts to utilize current interoperability standards for space-based infrastructure, to establish such

14 Art. III, Outer Space Treaty (*supra* n. 3).
15 Emphasis added.
16 *Cf.* Arts. 2(4), 51, 42–45, Charter of the United Nations, San Francisco, done 26 June 1945, entered into force 24 October 1945.

standards when current standards do not exist or are inadequate, and to follow such standards."

There is no specific comparable clause anywhere in the space treaties, but this is obviously an(other) straightforward to simply ensure efficiency, to act in the "most effective and appropriate"[17] ways in order to effectuate the desired cooperation. The main forward-looking aspect, given the intention to involve the private sector from the beginning and allow its role only to grow over time, concerns the reference to 'standards' as something that usually would be developed in close conjunction with that private sector in order to maximize its effectiveness.

7. Principle 6: Emergency Assistance

Principle 6 of the Artemis Accords provides: "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."

This Principle quite simply reiterates the fundamental obligation already enshrined in the Outer Space Treaty – to render astronauts "all possible assistance in the event of accident, distress, or emergency landing"[18] – and further elaborated by the Rescue Agreement[19]. Specifically when it comes to astronauts on celestial bodies, this refers to obligations to notify any accident as soon as possible to the launching authority of the astronaut and to the UN Secretary-General, to undertake best efforts to assist in search and rescue operations, and to ensure safe and prompt return of the astronaut to the launching authority.

8. Principle 7: Registration of Space Objects

Principle 7 of the Artemis Accords provides: "For cooperative activities under these Accords, the Signatories commit to determine which of them should register any relevant space object in accordance with 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."

Also this Principle is a straightforward reflection of the obligations under Article VIII of the Outer Space Treaty and the Registration Convention[20] to ensure proper registration, both nationally and internationally, of any object

17 Para. 4, Benefits Declaration (*supra* n. 9).
18 Art. V, Outer Space Treaty (*supra* n. 3).
19 See Arts. 1–4, Rescue Agreement (*supra* n. 4).
20 See notably Arts. II, IV, Registration Convention (*supra* n. 6).

launched into outer space, even if a State not party to the latter might be involved.[21] The main future issue in this context would be a strictly legal one: what if parts of the Artemis infrastructure on the Moon (or beyond) would not be constructed on Earth and then launched to their destination in outer space, but instead would be constructed on, and from materials excavated on, the Moon or other celestial bodies themselves – would they still qualify as 'space objects' for the purpose of the Registration Convention?

9. Principle 8: release of scientific data

Principle 8 of the Artemis Accords in its first two paragraphs basically reiterates the general commitment, subject to their discretion in specific cases to deviate in case of "any proprietary and/or export-controlled information", to coordinated "open sharing of scientific data", honouring once more the obligation of Article XI of the Outer Space Treaty already addressed by Principle 4.

The main impact of this principle thus lies in its third paragraph addressing the specific involvement of the private sector in the Artemis programme and their interest in protection of commercially valuable data, as it provides: "The commitment to openly share scientific data is not intended to apply to private sector operations unless such operations are being conducted on behalf of a Signatory to the Accords." The precise ramifications of this limitation, read the extent to which it may result in *non*-release of scientific data and what that might mean for international cooperation and compliance with international space law, yet remains to be seen.

10. Principle 9: Preservation of Outer Space Heritage

Principle 9 of the Artemis Accords provides: "1. The Signatories intend to preserve outer space heritage, which they consider to comprise historically significant human or robotic landing sites, artifacts, spacecraft, and other evidence of activity on celestial bodies in accordance with mutually developed standards and practices. 2. The Signatories intend to use their experience under the Accords to contribute to multilateral efforts to further develop international practices and rules applicable to preserving outer space heritage."

Already for a number of years NASA has been involved in efforts to convince other space actors of the value of preserving historical sites on the Moon such

21 Note that all twelve States so far engaged in the Artemis Accords by now *have* become a party to the Registration Convention (*supra* n. 6); see further Status of International Agreements relating to activities in outer space as at 1 January 2021; A/AC.105/C.2/2021/CRP.10, of 31 May 2021.

as the Apollo-11 landing site. The Artemis Accords would then clearly serve as another step towards hoped-for global recognition of the concept outer space heritage, followed by full-fledged observance of principles to be developed in this regard to achieve the intended level of protection. As long as the prohibition to apply territorial jurisdiction to the Moon pursuant to Article II of the Outer Space Treaty[22] for such purposes continues to be honoured thereby, such steps would not present any problem with regard to international law and/or international cooperation.

11. Principle 10: Space Resource Exploitation

Principle 10 of the Artemis Accords involves the likely most discussed provisions when "not[ing] that the utilization of space resources can benefit humankind by providing critical support for safe and sustainable operations" and "affirm[ing] that the extraction of space resources does not inherently constitute national appropriation under Article II of the Outer Space Treaty". Not everyone is in agreement that these statements are in line with "emphasiz[ing] that the extraction and utilization of space resources, including any recovery from the surface or subsurface of the Moon, Mars, comets, or asteroids, should be executed in a manner that complies with the Outer Space Treaty and in support of safe and sustainable space activities" and the claims "that contracts and other legal instruments relating to space resources should be consistent with that Treaty".

At least, the entities participating in the Artemis Accords do not intend to be secretive about it, as they "commit to informing the Secretary-General of the United Nations as well as the public and the international scientific community of their space resource extraction activities" and "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."

Much has been said and written about the 'other' interpretation of Article II of the Outer Space Treaty, that it would, further to the *res communis omnium* status of outer space itself, also qualify any space resources as *res communis omnium*, subject to exploitation activities only if fundamentally agreed to at an international level. Rather than rehashing this discussion in any detail, it has to be noted that the eleven States joining the United States in signing the Artemis Accords include not only Luxembourg and the United

22 Art. II, Outer Space Treaty (*supra* n. 3), provides: "Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means."

Arab Emirates, which were quick to follow the US lead in adopting national space laws allowing for commercial space resource exploitation[23], but also Brazil, one of the countries originally most vocally opposed against the US initiative to domestically allow space resource exploitation. Although hardly any details have been made public so far, Russia (the other State most vocally opposed to the US initiative) has now itself teamed up with China to provide something of a counter-initiative to the Artemis Accords in terms of long-duration lunar presence. Finally, Belgium, another country originally concerned with the perceived negative impact on international cooperation and international space law of the US initiative, as well as China have recently engaged with Luxembourg in efforts of closer cooperation concerning the latter's interest in space resource mining.

In short: while political opposition against this approach to space resource mining as also reflected in the Artemis Accords may continue to incentivize discussions on its propriety, it seems more focused on the spirit of international cooperation by the treaties, by definition more subject to political interpretation and differences of opinion, than the actual black-letter law thereof. To address these mainly political concerns, that spirit would probably be best served by developing further assurances that (read: more detailed legal and quasi-legal rules and principles to protect) humankind's general interests in lunar activities – in terms of safety, security, equity and the environment in particular – would be sufficiently safeguarded.

12. Principle 11: Harmful Interference and 'Safety Zones'

Principle 11 of the Artemis Accords would likely be second only to Principle 10 in terms of being disputed as potentially not conforming to key principles of space law. The longest Principle in the Accords, it starts out with acknowledging the importance of avoiding harmful interference with other legitimate activities and the key role that Article IX of the Outer Space Treaty plays in this regard.[24] Paragraph 6 then zooms in on a first concrete measure in this regard – somewhat of a first novelty in terms of space law, as the Artemis partners intend "to contribute to multilateral efforts to further

23 Following Title IV of the U.S. Commercial Space Launch Competitiveness Act, this concerns the Law on the exploration and utilization of space resources of 20 July 2017, published 28 July 2017, respectively Federal Law No. 12 of 2019 on the Regulation of the Space Sector (of 19 December 2019).

24 The longest clause in the Outer Space Treaty (*supra* n. 3), Article IX provides for a general obligation of due regard when acting in outer space, including efforts to avoid harmful interference and concurrent obligations of consultation. It is generally recognized as the legal baseline for the current developments towards more profound legal obligations addressing the problem of space debris.

develop international practices, criteria, and rules applicable to the definition and determination of *safety zones* and harmful interference"[25].

This raises concerns regarding compliance with the fundamental prohibition of the exercise of territorial sovereignty following Article II – how would establishment and (especially) enforcement of a safety zone be possible without the exercise of full territorial control? The Principle itself tackles these concerns by clarifying that the term 'safety zone' (only) refers to a zone where "nominal operations of a relevant activity or an anomalous event could reasonably cause harmful interference", following which "notification and coordination" will be called for in order "to avoid harmful interference". Again, the partners intend to be transparent about the actual detailed development of the concept of safety zones which is yet to take place.

In sum, it seems that it is mainly the term 'safety zone', with its connotation of requiring permission by the State concerned to enter that zone and – perhaps – the additional connotation of that State enforcing such controls, in the worst case by military force[26], which generated apprehension among non-Artemis partners about potential conflicts with the prohibition of territorial appropriation of Article II of the Outer Space Treaty. It is, however, actually more of a 'notification' zone, a zone for which the State establishing it strongly urges for notification of any activities by other States planned there in order to be able to timely and adequately address risks of harmful interference.

Ultimately, of course, the proof of the pudding is in the eating, but unless and until entry by one State or its entities into such a 'safety zone' of another State would trigger actual forceful measures or the threat thereof by the latter, the possibility of incompatibility of establishment of such zones with Article II of the Outer Space Treaty at worst is theoretical, and may well be legitimised by the need to preclude as much as possible harmful interference and/or risks to the rather harsh and unforgiving environment as contemplated by Article IX of the Outer Space Treaty.

25 Emphasis added.

26 Not accidentally, the comparison is often made with Air Defense Identification Zones (ADIZs), where certain States declare that entry into such a zone – even though part of the territorial-sovereignty-free areas of the high seas or Exclusive Economic Zones – by aircraft of another State (notably *military* aircraft) without proper notification and consultation may be considered a hostile threat or action, causing those States to reserve their right to take all countermeasures considered necessary to act against such a threat. See further https://en.wikipedia.org/wiki/Air_defense_identification_zone (last accessed 29 September 2021).

13. Principle 12: Space Debris Mitigation

Principle 12 of the Artemis Accords provides: "1. The Signatories commit 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, 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. 2. 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 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."
Clearly, these provisions echo the growing concerns with space debris also other than concerns for the specific lunar (or Martian) environment, which build upon Article IX of the Outer Space Treaty and are reflected in the IADC Guidelines[27] and the COPUOS Guidelines[28] on space debris mitigation, which currently seem to gradually morph into rules of customary international law following for instance the increasing implementation thereof in national space laws and licensing regimes.

14. Principle 13: Final Provisions

Principle 13 of the Artemis Accords provides for some procedural aspects which, while noting that "these Accords [are](…) not eligible for registration under Article 102 of the Charter of the United Nations" (meaning they do not formally qualify as a treaty under international law) – one may presume at least because the signatories are not States, but their space agencies – do mirror standard treaty provisions. To wit: there is a commitment to periodical consultations and review, to inform all UN members of the existence of the Accords and their contents, and the possibility for any other State to "submit its signature to the Government of the United States for addition to this text", which presumably creates the political – if indeed not legal – obligation to comply with the other Principles contained therein.

27 IADC Space Debris Mitigation Guidelines, IADC-02-01, Revision 1, September 2007.
28 Space Debris Mitigation Guidelines of the United Nations Committee on the Peaceful Uses of Outer Space (A/62/20), of 21 December 2007.

15. Conclusion

Looking at the thirteen Principles as a whole then, from the perspective of determining whether the key principles of international cooperation and compliance with international law are properly complied with – as substantially put in doubt for some of them by some actors in the space arena – the following summary would seem to be appropriate.

Out of the thirteen Principles, four (1, 2, 5 and 13) are essentially of a somehow 'procedural' nature. While being careful not to brand the Accords as a formal 'treaty' under international law, and thereby perhaps also downplaying the extent to which the Accords may possibly interfere with (other/existing) international law, it can of course not be excluded that parts or even all of the substance of the Accords would develop into customary international law – namely, if State practice and concordant *opinio juris* would develop along its lines involving a sufficiently large number of States. In any event, these 'procedural' Principles could only be seen as pragmatic agreements between the signatories to the Accords to facilitate and streamline the international cooperation intended to be its main result.

Most of the other Principles (3, 4, 6, 7, 8 and 12) basically restate, sometimes slightly elaborate existing principles of international space law, often closely tied precisely to the overarching goal of promoting international cooperation as posited by Articles I–III of the Outer Space Treaty. They should not therefore raise any concerns or question marks with respect to international cooperation or compliance with international space law either.

That leaves three out of the thirteen Principles which have turned out to provide at least potentially contentious elements. Whether it concerns addressing outer space heritage (Principle 9), space resource utilization (Principle 10) or the establishment of 'safety zones' (Principle 11), however, the drafters have taken great care to stress the distinction between proposing principles for cooperation among the Signatories in specific areas of the Moon (and later presumably other celestial bodies) and the actual appropriation by their respective States of such areas. Given that none of these measures directly infringe upon other States' opportunities and rights with respect to these areas – they and their entities are merely strongly suggested to respect outer space heritage, are entitled to make their own decision as to whether to allow their entities to exploit space resources, and are merely strongly requested to inform and consult in case of entering a safety zone (which for that reason seems to be a bit of a misnomer) for the purposes of avoiding harmful interference, environmental degradation and the generation of space debris – incompatibility with existing fundamental outer space law principles, notably that of the prohibition of national appropriation of Article II of the Outer Space Treaty, can only be argued either with a view to possible future events going beyond the Principles of the

Artemis Accords or by stretching some of the fundamental outer space law principles effectively beyond their intention.
From a broader perspective also, it only makes sense for States and space agencies initiating such a complex future cooperation adventure as Artemis envisages to agree on certain common principles on what would constitute proper behaviour in advance. To the extent the Russo-Chinese initiative to develop an alternative cooperation framework would allow third States to join just as the Artemis Accords allow for, even without clarity as of yet regarding which principles and fundamental agreements this alternative framework would be based upon, one can be certain that such third States will at least politically be required to commit to those principles and agreements. It can only be hoped that in the end the two alternative approaches would not run too far afoul of each other, so as to prevent any further customary international law underpinning the principles of international cooperation in space and compliance with international space law from developing.