SPACE RESOURCES:
MULTILATERALISM OR MULTIPOLARITY?

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INTRODUCTION

Space exploration and exploitation have seen significant increase in the past two decades, driven by the commercialization and privatization of space activities and technological advancement. Benefits of space are multifaceted and far-reaching, from everyday technologies like GPS and improved weather forecasts, to climate monitoring, disaster response capabilities and advancements in medicine, robotics and consumer products. The quest for the exploitation of natural resources on celestial bodies enters the scene in the past ten years and raises important challenges for the existing international space legal order and space governance. Will unilateral space mining efforts be compliant with existing international legal rules in Outer Space or is a multilateral cooperation in this lucrative space industry a legal must? Starting with the first national legislation authorizing commercial exploitation of space resources adopted by the United States and Luxembourg in 2015 and 2016, respectively, followed by the establishment of Artemis Accords in 2020 marking new adherents each year, this development in space politics progressed in spring 2025 with the introduction of the Initial draft set of recommended principles for space resource activities in the framework of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS).

On the one hand, such initiatives give rise to the continued legal questions and controversies like property rights or the legal nature of natural resources of celestial bodies the international community has faced since the negotiation of the space treaties in the 60's and 70's. On the other hand, the latest developments confirm an important tendency towards multilateral cooperation in the establishment of potential legal models of space mining. This policy brief aims to outline an overall international legal perspective on possible directions and challenges of the development of space resource activities, since not only space mining is the issue, but also the international legal foundations of space governance and the principle of multilateralism. It proposes a set of recommendations in light of international law.

1. SPACE MINING INITIATIVES

The US Space Act of 2015 that launched the exploitation drive entitles US citizens to recover, own, use, and sell asteroid or space resource.[1] Luxembourg[2] adopted a similar national law in 2016, followed by United Arab Emirates[3] in 2019 and Japan[4] in 2021.

The Artemis Accords, established in 2020 by the United States and signed by 55 States (as of June 2025), lay down a set of non-legally binding principles for cooperation in the civil exploration and use of the Moon, Mars, comets, and asteroids for peaceful purposes. The Accords affirm that "the extraction of space resources does not inherently constitute national appropriation under Article II of the Outer Space Treaty"[5] and entitle the States to establish and maintain safety zones to avoid harmful interference.[6]

The China-lead International Lunar Research Station (ILRS) project to establish an autonomous base on the Moon by 2035 for multi-discipline and multi-purpose scientific research activities includes a space resource utilization plan.[7] The project has been joined so far by 11 countries and a number of non-State entities and firms as well as international institutions[8].

Space resource activities fall within the realm of international space law with the Outer Space Treaty at the heart. The Outer Space Treaty[9] of 1967, ratified today by 116 States, including all major spacefaring countries, lays down the fundamental principles of international space legal order, including the principle of non-appropriation established in Article II: "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." It is supported by Article I stipulating that the exploration and use of outer space, including the Moon and celestial bodies, "shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind." In addition, the Moon Agreement (1979), ratified by only 17 States, which presumes explicitly the possibility to exploit natural resources of celestial bodies, requires the establishment of an international regime, including appropriate procedures, to govern such activities.[10]

Various interpretations confirming or denying the compliance of the first initiatives of space resource activities with Outer Space Treaty, or the Moon Agreement, reveal the multitude of interpretative approaches and interests raised by States, be they in good or bad faith and legally precise. Examples include the following arguments: "national appropriation" in Art. II does not cover "private appropriation"; natural resources are distinct from "outer space" or "celestial bodies" banned from appropriation; analogy between exploitation of space resources and freedom to fish in high seas; confusion between *res communis*[11] and common heritage of mankind; use of *in situ* resources for the benefit of all; prohibited

"national appropriation" only encompasses imposition of sovereignty and national jurisdiction allowing for property rights established under an international regime, etc.[12]

In this light, multilateral initiatives aiming to address these legal challenges and discrepancies have emerged. Since 2015, the topic of space resources has been included in the agenda of the UN COPUOS Legal Subcommittee and in 2021, the Working Group on Legal Aspects of Space Resource Activities was established[13], offering a unique intergovernmental universal platform to discuss and develop the applicable international legal regime. A multistakeholder initiative, The Hague International Space Resources Governance Working Group, composed of academic institutions and public and private sector actors, was set up in 2016 and proposed Building Blocks for the Development of an International Framework on Space Resource Activities in 2019, serving as an important contribution to the ongoing debate of States.[14]

2. MULTILATERAL OR MULTIPOLAR APPROACH?

The discussions on the potential legal models for activities in exploration, exploitation and utilization of space resources in UN COPUOS Legal Subcommittee reveal two tendencies in the diverging opinions expressed by States:

- to develop a framework for space resource activities primarily on the basis of *unilateral* instruments;
- to develop a framework governing space resource activities that is based on an open *multilateral* system in which all States are invited to participate and contribute to decision-making.[15]

The unilateral approach represented by the adoption of national space acts or by a club-based model (including an open club approach based on a predetermined and fixed set of values)[16] is efficient for practice-driven projects and effective launch of prospecting and mining missions. This multipolar track can fruitfully serve the multilateral approach as a stimulator for productive discussion in an open and inclusive multilateral system regarding the adaptation of the international legal framework *ab initio*. Series of unilateral acts, or a multipolar approach, might also possibly converge in identic core legal elements – be they consensually agreed upon or, *ultima ratio*, crystallized by the State practice.

If this is not the case, this legal discrepancy may stand in the way of achieving consensus on international legal principles governing the exploitation of natural resources and, thus, run the risk of increasing the political and economic tensions.

Considering that only a limited number of countries are able today to develop and deploy space mining technology, an important question arises as to the benefit sharing enshrined in Art. I of Outer Space Treaty[17]. Does benefit sharing refer only to material gains of exploitation of space resources or also to benefits deriving from space power politics,

information sharing, voice in international norm- and decision-making, sharing of intellectual property rights etc.?

Multilateral approach, on the contrary, effectuated in a universal platform based on an open and inclusive development of international legal framework *ab initio*, offers important benefits: guarantees of the legitimacy of the regime of space mining and allocation of the benefits gained from space resources; compliance with international legal order *ab initio*; legal security and certitude to investors by ensuring the recognition of their economic rights at the international level; and a global commitment to ensure sustainable use of outer space. This approach is therefore "likely to mitigate rather than increase the risk of international conflicts".[18]

The multilateral approach might be initially hindered by the lack of consensus on core principles, such as the non-appropriation principle or safety zones, as the current discussions on Initial draft set of recommended principles for space resource activities in the UN COPUOS Working Group show.[19] Nevertheless, it offers a unique universal forum for the discussion and solution of the legal challenges reflecting directly the developments in State practice. The diversified participation of States in the first round of the Working Group's deliberations in 2025, encompassing both spacefaring and non-spacefaring countries, Artemis Accords signatories and ILRS members, is a sign of multilateralism superimposed on the multipolar beginnings.

Furthermore, multilateral legal mechanisms have been achieved also in other international zones abundant in natural resources. This is the case of Deep Sea-Bed and international regime established under the International Seabed Authority,[20] the allocation of exploitation rights in the geostationary orbit governed under International Telecommunication Union,[21] or the Antarctic Treaty System recognizing a special status of States active in Antarctica.[22]

3. GUARANTEES OF MULTILATERALISM EMBEDDED IN INTERNATIONAL LAW

Regardless of the approach States choose to take and the particular interpretation of space treaties they formulate, international legal order intrinsically ensures multilateralism and inclusiveness. Normative unilateralism cannot modify the existing international space legal framework without reflecting the position of other States, including those that have remained silent and passive for now. The latter stance is only seemingly devoid of legal effects. The position of all States is therefore essential for further development of the rules on space mining and, thus, on space governance. Both interpretation and modification of multilateral treaties follow international procedural legal rules. States are free to adapt the existing substantive rules in line with their interests and needs while, however, respecting the legal

processes of international legal order. Disregard of the latter is a risk, degree of which depends on the legitimate protest of opponents. Disregard can sometimes achieve its ends *de facto*, however, peace and security might be at stake.

a. Space mining via interpretation of space treaties

The legal effect of disparate interpretations of the provisions of space treaties relevant to the exploitation of natural resources, notably of Art. II of Outer Space Treaty, is to be assessed under international legal rules on interpretation of international treaties laid down in Vienna Convention on Law of Treaties of 1969, Articles 31—32[23].

The interpretation of a treaty shall be done "in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose" (Art. 31 (1)). Article II of Outer Space Treaty, however, gives rise today to a great diversity of interpretations in view of the unrolling State practice.

In fact, nothing prevents the States from adopting a new or adapted interpretation, including via a subsequent practice, or application of Art. II of Outer Space Treaty in light of the new explorative and commercial pursuits. States are both the authors and addressees of international law and international law supports their activities and cooperation. Nevertheless, international treaty law contains express guarantees of multilateralism as regards the subsequent adjustments:

- an agreement of all parties to the treaty regarding its interpretation is required[24]
- a subsequent practice qualifies as an authentic means of interpretation if it is concordant and embracing all the parties and showing their common understanding of the meaning of the treaty[25]
- not all parties to the treaty must actively engage in the subsequent practice, in order to establish the agreement regarding its interpretation; silence or inaction on the part of one or more parties may constitute acceptance of the subsequent practice when the circumstances call for some reaction[26]
- subsequent agreement and practice may take a variety of forms; subsequent practice by a State may be expressed by the exercise of its executive, legislative, judicial or other functions[27]
- the practice of an individual State may have special relevance only when it relates to the performance of an obligation which particularly concerns that State[28].

This excludes a unilateral approach as to the interpretation or application of Outer Space Treaty with respect to the exploitation of space resources, be it by one State or a group of States, and the principle of inclusiveness and multilateralism constitutes the legal requirement for a valid approach in international law. Any interpretation of Art. II of Outer Space Treaty, and of other provisions relevant to space mining, could be legally viable[29]

under the condition it is shared by all parties to Outer Space Treaty, or at least not opposed. The practice of an individual State has no special pertinence in view of the general nature of relevant provisions in Outer Space Treaty binding all States parties.[30]

b. Space mining via customary modification of space treaties

If States opt for a more substantial approach deviating from Outer Space Treaty, or other space treaties, with respect to the exploitation of space resources, such a space policy is feasible and legally admissible under the condition that the rules on the modification of an international treaty are complied with.

The Outer Space Treaty can be modified in line with Article XV upon the acceptance by a majority of the States parties to the Treaty, i.e. currently at least 59 States (as of June 2025), and the amendment will enter into force for each State party to the Treaty accepting such amendment.[31]

Outer Space Treaty can be modified, too, by an international custom, i.e. via the repetition of practice which is uniform, constant and general and the belief that such a practice is compliant with international law (*opinio iuris*). Similarly to the interpretative subsequent practice, the active conduct of all parties is not required – a very widespread and representative participation provided it includes that of States whose interests were specially affected suffices to establish an international custom.[32] Acquiescence, too, substitutes positive action of all States. The question arises as to which States are those "whose interests were specially affected" with respect to the legal regime of exploitation of space resources? Considering the fact that outer space is the province of all mankind and shall be used in the interests of all countries, the regulation of space mining and modification of any core space law principles should be considered affecting all States, at minimum the States parties to Outer Space Treaty[33]. Limitation to spacefaring States, States actively engaged in the UN COPUOS Working Group on Legal Aspects of Space Resource Activities or, possibly, only States conducting space resource activities would deny the reality of space benefit sharing by all international community as well as the common responsibility for the sustainable use of outer space.

It is noteworthy that the practice giving rise to a custom does not only reside in space mining as such, but comprises a wide range of State acts, such as diplomatic acts, voting in international organizations, executive conduct, legislative and administrative acts, etc.[34] All sorts of State's positions may be relevant for the emergence of a custom, including silence and non-participation in the ongoing debates on potential legal models of space mining, and may produce legal effects.[35]

POLICY RECOMMENDATIONS

In order to maintain peaceful coexistence and the international rule of law in outer space and to ensure that outer space is used and explored for the benefit of all peoples, the following is recommended in relation to space resources activities:

- **Take benefit of the multilateral guarantees offered by international legal order** and participation in the formulation of the potential legal models for activities in exploration, exploitation and utilization of space resources (currently at the UN COPUOS Legal Subcommittee).

- **Take due regard of the rules on interpretation and modification of international legal norms** deriving both from Vienna Convention on Law of Treaties of 1969 and international customary law as outlined in this brief.

- **Be aware that silence and inaction are not deprived of legal effects** and might constitute an acquiescence with subsequent agreement or practice or the emergence of an international custom.

- **Seize efficiently the multilateral potential to guarantee the principle of benefit sharing** – especially States that will not prospectively have the capabilities and technology for exploitation of natural resources of celestial bodies.

- **Navigate the unilateral, or multipolar, approach** towards a follow-up multilateral forum enabling an inclusive participation in the development of the legal framework for space resource activities *ab initio*.

- **Weight up the real advantages and disadvantages for each individual State** stemming from the unilateral approach with no multilateral follow-up, as well as the legal and security risks.

- **Acknowledge the special nature of exhaustible or non-renewable space resources of celestial bodies.**

- **Take stock of lessons learned from the experience on Earth with the management of natural resources and law.**

- **Recognize our common responsibility for the sustainable use and exploration of outer space** and the protection of the space environment.

[1] U.S. Commercial Space Launch Competitiveness Act, H.R.2262 - 114th Congress (2015-2016), § 51303. Asteroid resource and space resource rights.
[2] Loi du 15 décembre 2020 portant sur les activités spatiales, A 1086, *Legilux*, English translation at Law of December 15th 2020 on space activities - The agency - Luxembourg Space Agency.
[3] Federal Law No. (12) of 2019 on the Regulation of the Space Sector, Federal Law No 12 of 2019 on THE REGULATION OF THE SPACE SECTOR.pdf.aspx, Article 18 ─ Exploration, Exploitation and Use of Space Resources.
[4] Act on the Promotion of Business Activities for Exploring and Developing Space Resources (Japanese Law Translation (Ministry of Justice), Act No. 83, 23 June 2021.
[5] Artemis Accords. National Aeronautics and Space Administration, 13 October 2020, Section 10 (2).
[6] Artemis Accords, Section 11. For a legal assessment of Artemis Accords, see e.g. Chazelle, Alexandre. "Application française des accords Artémis". *Revue française de droit aérien et spatial*, n° 3, 2025, forthcoming.
[7] See Technical Presentation "International Lunar Research Station" by Mr. Zhaobin Hu, China, at 66th session of the UN Committee on the Peaceful Uses of Outer Space on 5 June 2023, https://www.unoosa.org/documents/pdf/copuos/2023/TPs/ILRS_presentation20230529_.pdf; and Baptista, Eduardo. "China, Russia may build nuclear plant on moon to power lunar station, official says." *Reuters*, 23 April 2025.
[8] Jones, Andrew. "Senegal among new members of China's ILRS moon base project." *SpaceNews*, 5 September 2024.
[9] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. UNTC, 27 January 1967.
[10] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies. UNTC, 5 December 1979, Art. 11.
[11] In a sense of a common use by States without the right of appropriation.
[12] See, for example, States' positions and discussion in the following footnote.
[13] Originally established under the agenda item "General exchange of views on potential legal models for activities in the exploration, exploitation and utilization of space resources" at the 60th session of the Legal Subcommittee in 2021, the Working Group was renamed in 2022. For documents of the Working Group, see Working Group on Space Resources.
[14] Building Blocks for the Development of an International Framework on Space Resource Activities, 12 November 2019, The Hague International Space Resources Governance Working Group - Leiden University.
[15] Contribution by Belgium to the general exchange of views on potential legal models for activities in the exploration, exploitation and utilization of space resources. Working paper submitted by Belgium. AC105_C2_L325E.pdf, 28 February 2023.
[16] For an international relations analysis of Artemis Accords, see Anne-Sophie Martin and Paul Wohrer. "Les accords Artemis : Une stratégie américaine pour la gouvernance lunaire." *Ifri*, July 2024, p. 11 *et seq*.
[17] Although the principle of equitable sharing of benefits (which does not mean equal) is presumed in the Moon Agreement (Art. 11 (7d)), it reflects the fundamental principle of space law laid down in Art. I of Outer Space Treaty.
[18] Belgium (see footnote n15), p. 3.
[19] Initial draft set of recommended principles for space resource activities. Committee on the Peaceful Uses of Outer Space, Legal Subcommittee. A/AC.105/C.2/L.339, 27 March 2025; contributions received on the Initial draft are available at Working Group on Space Resources.
[20] United Nations Convention on the Law of the Sea. UNTC, 10 December 1982, Part XI, notably Articles 150─170; Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982. UNTC, 28 July 1994. Note, however, the Executive Order by the Government of the United States Unleashing America's Offshore Critical Minerals and Resources – The White House issued on 24 April 2025, and the response by Ms. Leticia Reis de Carvalho, Secretary-General of the International Seabed Authority, Statement on the US Executive Order: 'Unleashing America's Offshore Critical Minerals and Resources' - International Seabed Authority of 30 April 2025.

[21] Constitution of the International Telecommunication Union. ITU, 2022, Article 44 (2) (adopted by the 2022 Plenipotentiary Conference and published in Collection of the basic texts of the ITU adopted by the Plenipotentiary Conference (edition 2023)); Radio Regulations. ITU, edition of 2024.
[22] The Antarctic Treaty. UNTC, 23 June 1961, notably Art. IX; for more information on the Antarctic Treaty System, see Antarctic Treaty.
[23] Vienna Convention on the Law of Treaties. UNTC, 23 May 1969. These core rules of Vienna Convention codify an international custom, as confirmed by the International Court of Justice, so they apply also to States that have not ratified the Convention and to Outer Space Treaty which was adopted in 1967, prior to the entry into force of Vienna Convention in 1980, see e.g. Territorial Dispute (Libyan Arab Jamahiriya v. Chad). *ICJ Rep.* 1994, Judgment of 3 February 1994, para. 41; and Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory. *ICJ Rep*. 2004, Advisory opinion of 9 July 2004, para. 94.
[24] Vienna Convention, Art. 31 (3a, 3b). International Law Commission notes: "Conflicting positions regarding interpretation expressed by different parties to a treaty preclude the existence of an agreement", Draft conclusions on subsequent agreements and subsequent practice in relation to the interpretation of treaties. *Yearbook of the International Law Commission 2018*, vol. II, Part Two, A/CN.4/SER.A/2018/Add.1 (Part 2), commentary to Conclusion 10 (1), p. 60. The Commission highlights, on the contrary, that different *application* of a treaty by parties "does not, as such, permit a conclusion that there are conflicting positions regarding the interpretation of the treaty. [… I]t may also simply reflect a common understanding that the treaty permits a certain scope for the exercise of discretion in its application", p. 60. This is, for example, applicable with respect to human right treaties that aim for a unified interpretation but allow, at the same time, a margin of discretion to States.
[25] *Yearbook of the International Law Commission 1964*, vol. II, A/CN.4/SER.A/1964/ADD.1, p. 204, commentary to draft article 69, para. 13.
[26] International Law Commission (see footnote n24), p. 63 *et seq*. Similarly, the Commission explained that it omitted the word "all" with respect to the understanding of *all* the parties (future "agreement" in Art. 31 (3b)) "merely to avoid any possible misconception that every party must individually have engaged in the practice where it suffices that it should have accepted the practice", *Yearbook of the International Law Commission 1966*, vol. II, A/CN.4/SER.A/1966/Add.l, p. 222, commentary to draft article 27 (3b), para. 15.
[27] International Law Commission (see footnote n24), Conclusions 6 (2) and 5 (1).
[28] International Law Commission (see footnote n25).
[29] Under the condition it complies with international law, including the Charter of the United Nations.
[30] Moreover, preparatory works can serve as a supplementary means of interpretation in line with Art. 32 of Vienna Convention in case the basic interpretative rules laid down in Art. 31 leave the meaning ambiguous. Negotiations during the conclusion of Outer Space Treaty were not, however, marked by a significant confusion or ambiguity as to the meaning of Art. II since it confirmed the established practice by the first spacefaring States. A broad agreement confirmed the wide sense of "appropriation" referring to both public and private and excluding State sovereignty and private proprietary claims, see Hobe, Stephan, et al., editors. *Cologne Commentary on Space Law*, Volume I. Carl Heymanns Verlag, 2009, "Article II", p. 49 *et seq*. Some States, however, predicted already at that time that difficulties might arise when State activities involve exploitation (Hobe, pp. 58-59).
[31] This complies with general treaty law and Articles 39–41 of Vienna Convention (see footnote n23).
[32] North Sea Continental Shelf (Federal Republic of Germany v. Netherlands, Federal Republic of Germany/Denmark). *ICJ Rep.* 1969, Judgment of 20 February 1969, para. 73.
[33] The question will arise which of the Outer Space Treaty rules have a customary nature binding non-party States to the Treaty, too.
[34] Draft conclusions on identification of customary international law, with commentaries 2018. *Yearbook of the International Law Commission 2018* (see footnote n24), Conclusion 6 (2), p. 98.
[35] As International Law Commission precises, only deliberate abstention from acting may count as practice (the State must be conscious of refraining from acting in a given situation), International Law Commission n34, commentary to Conclusion 6 (1), p. 99. Moreover, it lays down that "[f]ailure to react over time to a practice may serve as evidence of acceptance as law (*opinio juris*), provided that States were in a position to react and the circumstances called for some reaction", Conclusion 10 (3), p. 103; see also e.g. Fisheries (United Kingdom v. Norway). *ICJ Rep*. 1951, Judgment of 18 December 1951, p. 139; Sovereignty over Pedra Branca/Pulau Batu Puteh, Middle Rocks and South Ledge (Malaysia v. Singapore). *ICJ Rep.* 2008, Judgment of 23 May 2008, para. 121.