



June 7, 2024

**Dear NASA Office of Technology, Policy, and Strategy:**

This comment on the Lunar Non-Interference Questionnaire<sup>1</sup> developed by the Office of Technology, Policy, and Strategy (OTPS) of the National Aeronautics and Space Administration (NASA) is provided primarily by Fellows and Junior Fellows of the Outer Space Institute, a global network of experts united in their commitment to highly innovative, transdisciplinary research that addresses grand challenges facing the use and exploration of space.<sup>2</sup>

On May 8, 2024, the OTPS asked for input “that will inform the development of a framework for further work on non-interference of lunar activities” and provided as background, among other things:

As dozens of countries and private sector companies have expressed interest in establishing lunar operations by the end of the decade, including many in the South Pole region, it will be critical to determine how to minimize interference and contamination in lunar activities. Deconfliction has been identified as an area of further work in Section 11 of the Artemis Accords and will be an area of increasing importance as the number of commercial and international actors operating on the lunar surface grows.

We recognize this effort to improve transparency, coordination, cooperation, and collaboration on and around the Moon and to seek increased granularity regarding the subjects raised in the Questionnaire. We further recognize the efforts by the United States,<sup>3</sup> including NASA, and their international partners<sup>4</sup> in delineating science goals related to the Moon.

The Questionnaire points to the Artemis Accords,<sup>5</sup> in particular Section 11 (titled “Deconfliction of Space Activities”). We have concerns about the non-binding Artemis Accords, which 42 States have now signed.<sup>6</sup> One particular concern is that the Accords may weaken international efforts and negotiations to achieve a space environment that minimizes security dilemmas caused by uncertainties and suspicions by some space actors about the actions and motives of others.

In our view, the scope of the Questionnaire is too narrow to provide substantive new “lunar community” input to “support NASA strategic decision-making on the protection needed for lunar activities”.<sup>7</sup> Cultural heritage sites, though referenced in the Artemis Accords,<sup>8</sup> are not addressed as a factor in this Questionnaire. One working definition of a lunar cultural heritage site is “any place with human material culture on the Moon or that is associated with intangible practices, representations, expressions, knowledge, or skills, that has historic, social, aesthetic, spiritual, or scientific significance for present and future generations”.<sup>9</sup> Moreover, activities on the Moon present issues of cultural, philosophical, and religious importance.<sup>10</sup> In addition, Respondents are not asked to address key substantive areas such as

ethics, societal implications, planning for future generations, differing cultural values, or diversity, equity, and inclusion.<sup>11</sup>

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- **How do you define these terms?**

- **Interference**

“Interference” means many things in many contexts.

Article IX of the 1967 Outer Space Treaty<sup>12</sup> provides for international consultation regarding potentially harmful interference by one State’s activities or experiments in space to those of another State. The Constitution of the International Telecommunication Union<sup>13</sup> provides in Article 45.1 that:

All stations, whatever their purpose, must be established and operated in such a manner as not to cause harmful interference to the radio services or communications of other Members or of recognized operating agencies, or of other duly authorized operating agencies which carry on a radio service, and which operate in accordance with the provisions of the Radio Regulations.

Various provisions in the ITU treaties, including the Radio Regulations, use the term in determining and setting limits to the use of the electromagnetic spectrum.<sup>14</sup>

The Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee on the Peaceful Uses of Outer Space (commonly called LTS Guidelines) use “interference” mostly in the context of radio frequency and physical conflicts between satellites. Guideline A.4 (Ensure the equitable, rational and efficient use of the radio frequency spectrum and the various orbital regions used by satellites) is the only Guideline that addresses interference directly.<sup>15</sup> Guideline A.4 calls on States and international intergovernmental organizations to undertake measures to resolve and avoid harmful radio frequency interference. Guideline A.4.6 also uses the term to refer to orbital debris, the interference of spacecraft and launch vehicle orbital stages that have terminated their operational phases in the GEO region.<sup>16</sup>

As a final set of examples, the provision of Starlink Wi-Fi services to the commercial aviation industry may cause interference by worsening price gouging and electromagnetic interference for aircrafts.<sup>17</sup> In politics, interference also refers to foreign influence, through the exchange of financial gains for political favors.<sup>18</sup> The context in which the term is used is key, and being too specific now risks creating more issues than defining the term further intends to solve. Instead, we find it is better to stress the need for ongoing international consultation, coordination, cooperation, and collaboration.

- **Contamination**

Article IX of the Outer Space Treaty<sup>19</sup> provides that:

States Parties to the Treaty shall pursue studies of outer space, including the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose.

This refers to both “backwards” (avoiding adverse changes in the environment of the Earth) and “forward” (understanding and controlling harmful contamination of non-Earth space by terrestrial organisms, organic materials and organic volatile materials) contamination. The Committee on Space Research (COSPAR),<sup>20</sup> an interdisciplinary international entity and the first Observer to COPUOS, has done substantial work on the prevention of such contamination.<sup>21</sup> Considering the work of COSPAR and the 1967 Outer Space Treaty, the drafters of the LTS Guidelines included the following Recommendation:<sup>22</sup>

States and international intergovernmental organizations should consider appropriate safety measures to protect the Earth and the space environment from harmful contamination, taking advantage of existing measures, practices and guidelines that may apply to those activities, and developing new measures as appropriate.

Like the term interference, “contamination” means many things in different contexts. Further examples include quality control guidelines and requirements of drug manufacturers,<sup>23</sup> airborne contaminants<sup>24</sup> and assessing cotton purity across continents.<sup>25</sup> While these are in different contexts than lunar operations, the concept of a form of quality control as applied to site preservation remains apt. Thus, how and where the term is used is key to its meaning. Again, we find it is better to stress the need for ongoing international consultation, coordination, cooperation, and collaboration.

- **Deconfliction**

The Artemis Accords uses this term in Section 11, titled “Deconfliction of Space Activities.” Section 11 refers to the language in Article IX of the 1967 Outer Space Treaty (“due regard” and “harmful interference”) and provides an initial set of points for how to operationalize deconfliction (use of “safety zones”).<sup>26</sup> We have nothing to add at this point other than to note that there is a potential danger in the designation of “zones”, regardless of intent, rather than emphasizing cooperation, coordination, and collaboration. In many situations, the concept of zone to ensure safety may be ill-defined, and with this, create suspicion of motives.

- **Understanding the Potential Value of a Site**

- **What attributes/characteristics are relevant to site selection in consideration of science objectives? Attributes may include time-sensitive or physical characteristics, holds awaiting technology or science advancements, or other perspectives. Example scenarios are encouraged.**

There is still much work to be done on assessing the attributes/characteristics relevant to science objectives. This is a large and complex question and, so far, discussions of lunar Sites of Extraordinary Scientific Importance (SESIs) on the Moon are in a very nascent stage. Much more deliberation, working across the many scientific disciplines interested in the Moon, is required. Whether such deliberations should be nation-specific or through multilateral dialogues, such as the Scientific and Technical Subcommittee of COPUOS, or through leadership by COSPAR working with other scientific discipline organizations, such as the International Astronomical Union, remains an open but urgent question.<sup>27</sup>

We point out that most orbital space about the Moon is unstable, and debris left in such orbits will impact the surface, creating one set of risks for lunar operations. The near-absence of an atmosphere rules out any reliance on ablation for reducing reentry safety risks on the Moon.

For lunar orbits that are stable, debris could accumulate in mission-critical orbits, compromising safety. Debris ejected into cislunar space will become a challenge for Space Domain Awareness. Such debris may impact the Moon or the Earth at a later time. Such debris, especially large debris pieces, also creates interference for other space exploration, such as astronomical observations.

We are concerned that the industrialization of space with emphasis on innovation and technology-driven solutions for space activities is based on the assumption that space can be developed perpetually.<sup>28</sup> This is not necessarily the case, as even low development rates could lead to unsustainable and adverse impacts in the long term, such as increased collisions risks and impairment of astronomical observations.<sup>29</sup> The lack of consideration for the potential consequences of development exacerbates long-term sustainability issues, while technology-enabled risk mitigation measures and non-binding standards in isolation are insufficient to deal with emerging harms.<sup>30</sup>

- **Impacting the Potential Value of a Site**

- **What human or robotic actions/events may negatively impact the value of a lunar site? Such as chemical contamination, physical contact, hardware proximity (for example Apollo hardware causing localized ‘moon quakes’ due to heating and cooling differences vs surroundings), waste hazards, etc.**
  - **How do the impacts of those actions/events alter the value of a site (e.g., unusable for certain missions, usable for certain missions but not others)?**
  - **What detrimental impacts are permanent, temporary, or still unknown?**

No comment noted at this time.

- **What data, models, or information is needed to inform the value? Such as how to understand where contaminants are going, what they are doing that impacts science, computational models validated with ground and flight data, etc.**

Improving transparency, coordination, cooperation, and collaboration on and around the Moon is key at many levels. These elements reduce risks for an operator’s safety and sustainability of one’s own operations, including risks from conflict. They also prevent or reduce negative impacts on the cis-lunar environment, the protection of which is an interest shared by all States.

Transparency, coordination, cooperation, and collaboration should include dedicated mechanisms, such as the sharing of situational awareness, other information, and positioning, navigation and timing (PNT) capabilities to the greatest degree practicable. This can be done on a step-by-step basis whereby some transparency leads to additional transparency, as space actors learn to trust each other. This sharing should be done in a timely manner and in a usable format to promote operational sustainability and safety, to avoid misunderstandings between States and/or other operators, and to reduce their decision-making uncertainties.

- **Mitigation Mechanisms**

- **What types of mitigation mechanisms exist to preserve the value of a site?**

- **During what phases of operations are mitigation mechanisms needed? Examples include ascent/descent, overflight, traverse, contingency, experimental or construction**

No comment noted at this time.

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We acknowledge the United States' views on achieving a global consensus on Moon resource extraction, as expressed by the U.S. Representative to the Legal Subcommittee (LSC) of the Committee on the Peaceful Uses of Outer Space (COPUOS)<sup>31</sup> in April:

[The United States sees] potential benefits of a general, high-level initial set of recommended principles to help ensure that all nations engaged in space resource activities share a common set of fundamental beliefs: in the rule of law, transparency, open science, interoperability, avoiding harmful interference, and in peaceful purposes, among others. The Artemis Accords underscores these and other critical principles, and forms a starting point for our efforts on space resource activities.

We support inclusive multilateral deliberations concerning the safe and sustainable use of cislunar space.<sup>32</sup> If the Artemis Accords are a starting point, we are concerned that the cooperative work among Artemis Accords signatories is not being openly disseminated. Keeping the information developed internal to Artemis Accords signatories undermines assertions about transparency.

Press reports state that at a meeting of senior officials of the Artemis Accords signatories on the sidelines of the October 2023 International Astronautical Congress (IAC), efforts continued to establish principles for safe and sustainable space exploration.<sup>33</sup> Two Working Groups at this meeting had met in June 2023 and collaborated on such efforts. The Working Group on Mitigation and Avoidance of Interference to Promote Safety in Lunar Operations developed an initial set of mission information items that should be disclosed to avoid interference on the surface, including launch and lunar landing dates, mission duration and related deployments, and information concerning scientific activities worthy of special consideration.<sup>34</sup> The United States followed this coordinated approach and submitted information to the United Nations Office of Outer Space Affairs (UNOOSA) for scientific payloads that were carried on commercial spacecraft earlier this year under the NASA Commercial Lunar Payload Services project.<sup>35</sup> Meanwhile, the Emerging Space Actors Working Group aimed to enhance international collaboration and focuses on devising ways to involve less experienced countries in space research and exploration based on the principles and values set forth in the Artemis Accords.<sup>36</sup>

According to press releases, face-to-face meetings took place in Canada in late May 2024.<sup>37</sup> During these meetings, “participants from 24 countries engaged in robust discussions and conducted a tabletop exercise centered on further defining and implementing key tenets, including non-interference, interoperability, and scientific data sharing among nations”.<sup>38</sup> The outcomes of this workshop are supposed to result in “deliverables” for a meeting of Artemis Accords senior officials at the 2024 International Astronautical Congress. We are concerned that this valuable work is not being shared more broadly.

We note the excellent work done by the Working Group on Legal Aspects of Space Resource Activities at the COPUOS LSC in April 2024.<sup>39</sup> We further note that the Working Group is

expected to continue, among other things, to exchange views on the development of a set of initial recommended principles for activities involving space resources at the Spring 2025 LSC Working Group meeting. The work is expected to take into account an initial draft on this matter prepared by the Chair and the Vice-Chair of the Working Group in advance of the Spring 2025 LSC.

Additionally, we note that the draft *Proposal on a Consultative Mechanism on Lunar Activities: Conference Room Paper by Romania, co-sponsored by Switzerland*,<sup>40</sup> makes strong points. The proposal, which COPUOS may decide to adopt this month, in essence is to establish an Action Team on Lunar Activities Consultation (ATLAC) under COPUOS. The ATLAC would thus include consideration by COPOUS and its two Subcommittees throughout its existence.

As requested, we copied and pasted the questions in the Questionnaire into a searchable, unlocked Word (DocX) file with edit permissions enabled. We include electronic links to references, studies, research, and other empirical data that are not widely published.

Yours sincerely,

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**Charlotte Hook**, Junior Fellow, Outer Space Institute

**Mac Evans**, Former President of the Canadian Space Agency

**Samantha Lawler**, Associate Professor of Astronomy, University of Regina; Fellow, Outer Space Institute

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**Sarah Thiele**, PhD Student in Astrophysics, Princeton University; Junior Fellow, Outer Space Institute

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**Sara Russell**, Merit Researcher, Natural History Museum London

**Giuliana Rotola**, PhD Student, Sant'Anna School of Advanced Studies

**Gerhard Drolshagen**, Former Chair of the Space Mission Planning Advisory Group and former staff member in the Space Safety Division of ESA (retired)

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<sup>1</sup> *OTPS seeks input from the lunar community to inform a framework for further work on non-interference of lunar activities*, (8 May 2024), NASA, <https://www.nasa.gov/organizations/otps/otps-seeks-input-from-the-lunar-community-to-inform-a-framework-for-further-work-on-non-interference-of-lunar-activities/>.

<sup>2</sup> Outer Space Institute (OSI), <https://outerspaceinstitute.ca/>.

<sup>3</sup> Including the *The Lunar Exploration Roadmap: Exploring the Moon in the 21<sup>st</sup> Century: Themes, Goals, Objectives, Investigations, and Priorities*, 2016, Lunar Exploration Analysis Group referenced in the Questionnaire and other relevant studies done by the Lunar Exploration Analysis Group; the 2022 results of the Artemis III Science Definition Team assembled by the Planetary Science Division, Science Mission Directorate, NASA, <https://www.lpi.usra.edu/Artemis/>; and the results of the Technical Assessment Report by Azita Valinia, John M. Grunsfeld, Michal G. Hess, James Green, and James Schier et al., (November 2022), *Unique Science from the Moon in the Artemis Era*, <https://ntrs.nasa.gov/citations/20220017053>, (Report ID: 20220017053).

<sup>4</sup> See ISECG (International Space Exploration Coordination Group) publications, *The Global Exploration Roadmap*, (2011, 2013, 2018), and *The Global Exploration Supplement*, (2020, 2022), <https://www.globalspaceexploration.org/?cat=3>; *Scientific Opportunities Enabled by Human Exploration Beyond Low-Earth-Orbit*, (2017), [https://www.globalspaceexploration.org/wordpress/wp-content/isecg/ISECG%20SWP\\_FINAL-web\\_2017-12.pdf](https://www.globalspaceexploration.org/wordpress/wp-content/isecg/ISECG%20SWP_FINAL-web_2017-12.pdf); *Annual Report*, (2023), <https://www.globalspaceexploration.org/wp-content/uploads/2024/05/ISECG%20Annual%20Report%202023.pdf> (in particular, p.7-8 about the Science Working Group and the Emerging Space Agencies Working Group); *In-Situ Resource Utilization Gap Assessment Report*, (2021), <https://www.globalspaceexploration.org/wordpress/wp-content/uploads/2021/04/ISECG-ISRU-Technology-Gap-Assessment-Report-Apr-2021.pdf>.

<sup>5</sup> Artemis Accords, (13 October 2020), <https://www.nasa.gov/wp-content/uploads/2022/11/Artemis-Accords-signed-13Oct2020.pdf>.

<sup>6</sup> Jeff Foust, (30 May 2024), *Peru and Slovakia sign the Artemis Accords*. SpaceNews. <https://spacenews.com/peru-and-slovakia-sign-the-artemis-accords/>.

<sup>7</sup> *OTPS*, (8 May 2024).

<sup>8</sup> Section 9—Preserving Outer Space Heritage, Artemis Accords.

<sup>9</sup> *Annex I - Technical and Operational Practices and Case Studies on Peaceful and Sustainable Lunar Activities*, (7 February 2023), GEGSLA, <https://moonvillageassociation.org/download/gegsla-annexes/>, p.30. For a cogent discussion of this topic, please see Alice Gorman, (22 March 2023), “[The sustainable management of lunar natural and cultural heritage: suggested principles and guidelines](https://moonvillageassociation.org/download/gegsla-the-sustainable-management-of-lunar-natural-and-cultural-heritage-suggested-principles-and-guidelines/)”, *Report to the Global Expert Group on Sustainable Lunar Activity*, <https://moonvillageassociation.org/download/gegsla-the-sustainable-management-of-lunar-natural-and-cultural-heritage-suggested-principles-and-guidelines/>.

<sup>10</sup> Leslie I. Tennen, (September 2022), “The Development Space Sustainability Standards Through National Licensing Regimes”, 73rd International Aeronautics Congress, IAC-22, E7,4, <https://iafastro.directory/iac/paper/id/70552/summary/>; J.D. Rummel, M.S. Race, G. Horneck, the Princeton Workshop Participants, (2012), “Ethical considerations for planetary protection in space exploration: a workshop.” *Astrobiology*, vol. 12,11: 1017-23, doi:10.1089/ast.2012.0891.



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<sup>11</sup> Zachary Pirtle, Katherine McBrayer, and Alyse Beauchem, (21 September 2023), *Artemis, Ethics and Society: Synthesis from a Workshop*, <https://ntrs.nasa.gov/citations/20230012799>, (Report ID: 20230012799).

<sup>12</sup> Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, (19 December 1966), <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/outerspacetreaty.html>.

<sup>13</sup> Constitution and Convention of the International Telecommunication Union, (22 December 1992), as amended, <https://treaties.un.org/doc/Publication/UNTS/Volume%201825/volume-1825-I-31251-English.pdf>.

<sup>14</sup> Peter A. Tenhula, Carl R. Frank, (2022), Regulation of Radio Frequency Communications: The Untold History of 'Harmful Interference', available at *SSRN 4213923*, <https://ssrn.com/abstract=4181043>.

<sup>15</sup> Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee on the Peaceful Uses of Outer Space, (21 June 2019), [https://www.unoosa.org/documents/pdf/PromotingSpaceSustainability/Publication\\_Final\\_English\\_June2021.pdf](https://www.unoosa.org/documents/pdf/PromotingSpaceSustainability/Publication_Final_English_June2021.pdf).

<sup>16</sup> LTS Guidelines.

<sup>17</sup> Christopher U., (2023), *What's more outrageous than airline ticket costs and uncomfortable economy seating?* LinkedIn. [https://www.linkedin.com/posts/activity-6988625611346837504-DKSc?utm\\_source=share&utm\\_medium=member\\_desktop](https://www.linkedin.com/posts/activity-6988625611346837504-DKSc?utm_source=share&utm_medium=member_desktop).

<sup>18</sup> Samuel Petrequin, (29 May 2024), *Police search the European Parliament over suspected Russian interference, prosecutors say*. AP News. <https://apnews.com/article/eu-belgium-prosecutors-search-russian-interference-ac5f48ed7650ce1b0e3b5464bca8fa20>.

<sup>19</sup> Article IX, Outer Space Treaty.

<sup>20</sup> Committee on Space Research (COSPAR), <https://cosparhq.cnes.fr/>.

<sup>21</sup> A. Coustenis, N. Hedman, G. Kminek, and P. Rettberg, (28 February 2021), *The COSPAR Panel on planetary protection: Recent activities*. CORE. <https://core.ac.uk/outputs/395065090/?source=2>.

<sup>22</sup> Section D.1.4, LTS Guidelines.

<sup>23</sup> Sarvesh Mishra, (2024), *Contamination & Contamination Control Strategy*. LinkedIn. [https://www.linkedin.com/posts/dr-sarvesh-mishra-20807120\\_contamination-contamination-control-strategy-activity-7201487739685330946-0rv6?utm\\_source=share&utm\\_medium=member\\_desktop](https://www.linkedin.com/posts/dr-sarvesh-mishra-20807120_contamination-contamination-control-strategy-activity-7201487739685330946-0rv6?utm_source=share&utm_medium=member_desktop).

<sup>24</sup> Jakub Masnica, (2024), *The Importance of Floor Level Contamination Control for Companies*. LinkedIn. <https://www.linkedin.com/pulse/importance-floor-level-contamination-control-jakub-masnica-bluqe/?trackingId=GMwNrGIKRquO6PKMM3p9Gw%3D%3D>.

<sup>25</sup> Premier Evolvics Pvt. Ltd., (2024), *PREMIER UniQ: A Technology Leap in Cotton Contamination Detection with AI*. LinkedIn. <https://www.linkedin.com/pulse/premier-uniq-technology-leap-cotton-contamination-detection-c5uic/?trackingId=5k%2BGil64RyiFc1HLP4tlow%3D%3D>.

<sup>26</sup> Artemis Accords.

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<sup>27</sup> Alanna Krolkowski and Elvis Martin, (2024), Potential and perils: paths to protecting lunar sites of extraordinary scientific importance (SESIs) for astronomy before it is too late. *Phil. Trans. R. Soc. A*.38220230078, <http://doi.org/10.1098/rsta.2023.0078>.

<sup>28</sup> Andrew Williams, Aaron Boley, Giuliana Rotola, and Richard Green, (2024), “Sustainable skies and the Earth–space environment.” *Nature Sustainability* 7, no. 3: 228-231, <https://www.nature.com/articles/s41893-024-01308-8>.

<sup>29</sup> “Sustainable skies”.

<sup>30</sup> “Sustainable skies”.

<sup>31</sup> *U.S. Statement as prepared for U.S. Representative Emily Pierce – Agenda Item 9 – POTENTIAL LEGAL MODELS FOR ACTIVITIES IN EXPLORATION, EXPLOITATION AND UTILIZATION OF SPACE RESOURCES*, (18 April 2024), U. S. Mission to International Organizations in Vienna. <https://vienna.usmission.gov/u-s-statement-agenda-item-9-63rd-session-of-the-copuos-lsc-april-2024/>.

<sup>32</sup> For the purpose of this Response, OSI defines cislunar space as the volume extending from Earth’s geosynchronous orbits and encompassing the Moon, the Moon’s orbits, the Earth–Moon Lagrange points, and certain types of transfer orbits.

<sup>33</sup> Andrew Jones, (3 October 2023), *Artemis Accords signatories seek to boost transparency and safety in lunar exploration*. SpaceNews. <https://spacenews.com/artemis-accords-signatories-seek-to-boost-transparency-and-safety-in-lunar-exploration/>.

<sup>34</sup> *U.S. Statement as delivered by U.S. Ambassador Laura S.H. Holgate – Agenda Item 4 – General Exchange of Views*, (16 April 2024), U.S. Mission to International Organizations in Vienna, <https://vienna.usmission.gov/u-s-statement-agenda-item-4-63rd-session-of-the-copuos-lsc-april-2024/>.

<sup>35</sup> Hogate statement.

<sup>36</sup> *Poland hosts talks on the Artemis Space Program - POLSA - Polska Agencja Kosmiczna*, (16 June 2023), POLSA, <https://polsa.gov.pl/en/news/poland-hosts-talks-on-the-artemis-space-program/#:~:text=From%20June%2019th%20to%2021stlunar%20program%2C%20gathered%20in%20Gda%C5%84sk>.

<sup>37</sup> *NASA engages in Artemis Accords Workshop to advance exploration*, (24 May 2024), NASA, <https://www.nasa.gov/news-release/nasa-engages-in-artemis-accords-workshop-to-advance-exploration/>; for more information, see *Artemis Accords for Sustainable Space Exploration - Canada welcomes partners from around the world*, (21 May 2024), Canada.ca, <https://www.canada.ca/en/space-agency/news/2024/05/artemis-accords-for-sustainable-space-exploration---canada-welcomes-partners-from-around-the-world.html>; POLSA Polska Agencja Kosmiczna | Polish Space Agency, (2024), *W dniach 21-23 maja br. odbyły się warsztaty Artemis Accords 2024*. [https://www.linkedin.com/posts/polska-agencja-kosmiczna\\_polsa-artemisaccords-kari-activity-7201167865440305154-oFix?utm\\_source=share&utm\\_medium=member\\_desktop](https://www.linkedin.com/posts/polska-agencja-kosmiczna_polsa-artemisaccords-kari-activity-7201167865440305154-oFix?utm_source=share&utm_medium=member_desktop); Nicolas Maubert, (2024), *Montreal was the international center of space exploration last week*. [https://www.linkedin.com/posts/nicolas-maubert-46650210\\_artemisaccords-artemis-outerspacetreaty-activity-7201046927751229441-WC\\_U?utm\\_source=share&utm\\_medium=member\\_desktop](https://www.linkedin.com/posts/nicolas-maubert-46650210_artemisaccords-artemis-outerspacetreaty-activity-7201046927751229441-WC_U?utm_source=share&utm_medium=member_desktop).

<sup>38</sup> *NASA engages in Artemis Accords Workshop*.

<sup>39</sup> “Report of the Chair and Vice-Chair of the Working Group on Legal Aspects of Space Resource Activities” (as adopted by the full Committee in April 2024), COPUOS LSC, [https://www.unoosa.org/res/oosadoc/data/documents/2024/aac\\_105c\\_2sral/aac\\_105c\\_22024sral\\_1\\_0.html/AC105\\_C2\\_2024\\_SRA\\_L01E.pdf](https://www.unoosa.org/res/oosadoc/data/documents/2024/aac_105c_2sral/aac_105c_22024sral_1_0.html/AC105_C2_2024_SRA_L01E.pdf), paragraph 10. The Working Group noted a number of

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elements as well as questions in paragraph 7 of the Report that need to be “addressed in the course of the development of an initial set of recommended principles for space resource activities, in accordance with the work plan of the Working Group. These elements include but not limited to, the centrality of the provisions of the Outer Space Treaty; the principles of non-appropriation and the peaceful use of outer space; matters related to the nature and purpose of space resources and their potential benefits for both scientific research and economic development; the economic, environmental and equitable aspects of space resource activities; the protection of interests of current and future space actors; ethical, indigenous and intergenerational aspects; private sector involvement; and interests of developing countries.”

<sup>40</sup> “Proposal on a Consultative Mechanism on Lunar Activities: Conference Room Paper by Romania, co-sponsored by Switzerland”, (23 April 2024), COPUOS LSC, [https://www.unoosa.org/res/oosadoc/data/documents/2024/aac\\_105c\\_22024crp/aac\\_105c\\_22024crp\\_18rev\\_1\\_0\\_html/AC105\\_C2\\_2024\\_CRP18Rev01E.pdf](https://www.unoosa.org/res/oosadoc/data/documents/2024/aac_105c_22024crp/aac_105c_22024crp_18rev_1_0_html/AC105_C2_2024_CRP18Rev01E.pdf).