International Agreements:
One Section May Prevent Many Problems

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Without a well-drafted "Dispute Resolution Section" (including but not limited to a thorough international arbitration agreement), a party to any international contract risks the possibility that one or more breaching party(ies) may be able to effectively evade civil prosecution, due to that one (or more) the party's home country/jurisdiction, due to an absence of minimum contacts with any U.S. Absent a well written Dispute Resolution Section, the breaching party(ies) may simply be unreachable beyond their home shores and as such, be forever beyond the shores of justice.

Jurisdictional barriers to otherwise valid contractual claims can result in the breaching party(ies) choosing to:

- Ignore a lawsuit or arbitration filed by the complaining party in the complaining party's home jurisdiction or vaguely defined proper arbitration venue;
- Challenge the venue of any such filed lawsuit or arbitration in an attempt to relocate to the litigation/arbitration to the potential defendant(s)/respondent(s) home nation;
- Even enter into litigation or arbitration with no intent to pay any judgment or arbitral award, due to post-judgment/post-award issues, including collateral attack or other post-verdict/award arguments created by unaddressed issues;

Unique Issues in International Dispute Resolution Section:

Some examples of issues which are often not contemplated in regional/U.S. contracts (but may be), in the Dispute Resolution Section are as follows:

- **Required Mediation *Before* Litigation or Arbitration:** The parties are always free (in any international or regional contract), to agree to a cooling off period, prior to commencing litigation or arbitration, in which they will enter into mediation – informal or formal;

- **Venue:** The parties can agree as to what nations (and jurisdictions) litigation or arbitration may be brought under the Dispute Resolution Section;
  - This designation may be limited to one or more nations and jurisdictions;
  - This designation may be a neutral nation and jurisdiction or may be the nation and jurisdiction of one or more of the parties to the contract;

- **Arbitration (Exclusive or Non-Exclusive):** The parties may agree exclusively to litigation or arbitration, but may agree to either/both, anywhere in the world;
  - **Arbitration Must be Agreed to by All the Parties to the Contract:** In order for any arbitral body to obtain jurisdiction over all the parties to any contract, each signatory must agree to the jurisdiction of the tribunal (in the Dispute Resolution Section). This is the only way in which the arbitral body may assume the necessary jurisdiction to render a valid award;
    - Confidentiality: The parties may agree to confidential arbitration, whereas most jurisdictions in the world (though not all) conduct litigation in a somewhat-to-total-public forum as in the U.S.;

- **Agreement as to the Procedural and Substantive Rules:** The Parties are free to, and should agree in the Dispute Resolution Section, to the designation of what rules will be used controlling all procedural and substantive issues in the agreed-to arbitration and/or litigation;
  - **Substantive Law**
    - **Substantive Law:** The controlling law may be selected from a venue and jurisdiction outside of where the arbitration will take place.
  - **Procedural Law**
    - **Procedural Law which Results in Substantive Outcome:** In certain instances procedural law may result in definitive substantive outcomes (including rulings or an award), therefore the parties should establish any boundaries or limitations of the agreed-upon procedural rules.

- **Service:** The parties will be bound to the jurisdictional requirements regarding service for the commencement of a lawsuit (subject to international service treaties which may apply), however, the parties may create their own definition of valid service for purposes of arbitration.
  - **Valid Service Necessary for Any Lawsuit or Arbitration:** Without a party being validly served, litigation or arbitration may not validly commence. Improper service may result in the challenge of a judgment or award, which could potentially overturn the final judgment or award;

- **Certification of Arbitral Award or Foreign Civil Judgment:** The parties may stipulate in the Dispute Resolution Section their agreement that a court judgment or arbitral award may be executed in a jurisdiction other than where said judgment or award was issued. Again, such a stipulation may be valuable in order to deprive the losing party from an argument challenging the validity of the trial judgment or arbitral award in the event the prevailing party seeks to convert and enforce the judgment or award in a foreign jurisdiction.

Unfortunately, companies both large and small, learn all too often that in the arena of international commercial contracts, serious ramifications can result through a failure to include a properly drafted Dispute Resolution Section in their international agreements.

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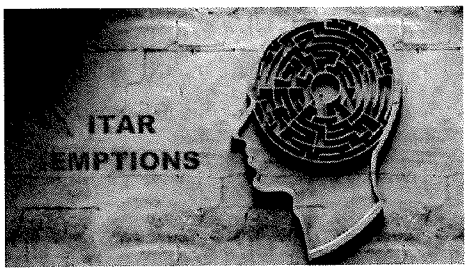

The ITAR and U.K. Exemptions, Better Read the Regulations Carefully

By: **Bruce Leeds**, Senior Counsel, Braumiller Law Group and **S. George Alfonso**, Of Counsel Braumiller Law Group and President Reigncore, LLC.

On behalf of our example, we'd like to introduce you to "Joe Compliance." Imagine Joe Compliance is going through the International Traffic in Arms Regulations (ITAR) and notices license exemptions for Australia and the UK in Part 126.16 126.17. Joe thinks "this is great" because a business unit at his company is planning exports of defense articles to both countries.

Under the ITAR a license exemption means that the exporter does not need a license or agreement to export or temporarily import defense articles or defense services. To qualify to use a license exemption, the exporter must be registered with the Directorate of Defense Trade Controls (DDTC), meet all the requirements for use of the exemption, and declare the exemption on the Electronic Export Information (EEI) filed in the Automated Export System. Exporters should assume that DDTC and US Customs & Border Protection will interpret and enforce ITAR exemptions strictly.

What Joe needs to do is to read Parts 126.16 and 126.17 carefully to determine if his company meets all the requirements to use either of these exemptions. The first thing Joe notices is the titles of these parts. They read "pursuant to the Defense Trade Cooperation Treaty between the United States and Australia (or UK)." This indicates there are treaties that form the basis for these exemptions, meaning that use of any exemption must be in accordance with these treaties.

The regulations for the two exemptions read in a similar manner. Let's look at Part 126.17 for the UK exemption to see what is required.

- The exporter must be a member of the United States Community. The US Community includes US Government agencies acting in their official capacity, and non-governmental exporters registered with DDTC and eligible to apply for and receive an export license.

- The exporter will need to be registered for the Defense Export Control and Compliance System (DECCS).

- The export must be to a member of the United Kingdom Community. The community consists of (1) UK governmental entities identified at the DDTC website (pmddtc.state.gov), and (2) non-governmental entities identified as part of the UK Community at the DDTC website. The lists of these entities are located in the Treaty Compliance System in DECCS.

- The exported defense articles or defense services must be for one of the authorized end uses identified in Part 126.17(e) or the eligible programs listed at the DDTC site.

- The exported defense articles or defense services must meet the qualifications and restrictions in Part 126.17(g).

- Any transfers, retransfers or re-exports must meet the conditions in Part 126.17(h).

- Classified and unclassified articles exported under the treaty and exemption must bear special marking.

- Any intermediate consignees in the UK, such as customs brokers and freight forwarders, must be identified on the list of Authorized United Kingdom Intermediate Consignees at the DDTC website.

- The UK exemption must be cited on the EEI filed in the Automated Export System at the time of export. Additional information, such of the name of the program, may also be required on the EEI.

- The US exporter of defense articles or defense services under the exemption must keep detailed records of each export and make them available to the US Government on request.

Exporters that cannot meet all these requirements cannot use the exemption.

What about Australia? Other than the name of the country involved, the regulations governing the exemption in Part 126.16 of the ITAR are very similar. Anyone wanting the use the ITAR exemption for Australia will need to meet many – if not most – of the same requirements. The same goes for Canada and Japan.

What about Joe Compliance? After reading the regulations and reviewing the requirements, he advised the business unit at his company to either apply for a license or forget about exporting to the UK or Australia.

"When considering the continuing saga of Joe Compliance and ITAR Exemptions, the fact remains, it doesn't have to be this way." stated S. George Alfonso, Of Counsel Braumiller Law Group, and President Reigncore, LLC, a lobbying firm. The above tale of Joe Compliance is a story that doesn't have to end with Joe having wasted hours of his life he'll never get back, reading the International Traffic in Arms Regulations

(ITAR) notices and license exemptions, only to give up on his idea of utilizing the codified "ITAR Exemptions"[1] in order for his company to substantially benefit from these codified and authorized Exemptions, although unfortunately the vast majority of businesses do *exactly* this.

Instead, as an alternative to simply taking a "pass" based on complexities involved, Joe could've retained the services of a lobbying firm focusing on international trade, including ITAR and ITAR Exemptions.

The ITAR Exemptions were created specifically to assist companies planning export defense articles to the identified nations or regions, with the ability to avoid the necessity of obtaining a license or agreement to export, or temporarily import, defense articles or defense services.

However, the opaque language and intertangling references to sections and treaties in reality, has rendered most companies too timid to attempt to undertake the potential benefits to ITAR Exemptions, due in part to:

- Ongoing self-imposed and self-monitored Exemption requirements;
- The inherent substantial financial risks in penalties and violations in the event the company is determined subsequently to have failed to satisfy all required Exemption requirements; and,
- A negative view of potential contractors who desire to deal with companies who state their intention to attempt to operate under ITAR Exemptions.

How would a lobbying firm's assistance work then? Joe could retain a lobbying firm who would specifically draft for his relevant country, or group of countries, via something similar to "ITAR Exemption for Dummies". Joe would therefore be equipped with a plain English, easily understandable roadmap on what will be required to initially satisfy the ITAR Exemption requirements, as well as a checklist for the required ongoing self-monitored ITAR Exemption compliance. The lobbying firm would also provide ongoing consulting to Joe and his company in order to ensure that the company doesn't make any subsequent mistake or omission, which would render an otherwise compliant **ITAR Exemption Program** in violation of the Exemption rules and thereby subject to substantial fines and penalties.

* Reigncore was founded by Adrienne Braumiller (Senior Partner of Braumiller Law) and S. George Alfonso (founder of The Law Offices of S. George Alfonso). This is a uniquely qualified partnership as there are very few lobbying firms that also have expertise in international trade, which in the case of Joe Compliance, is essential. For more information, SGeorge@Reigncore.com. www.reigncore.com

[1]. *See* §§ 123/125/126:

- Japan [See § 123.9];
- "NATO Nations" [See § 123.9];
- Canada [See § 126.5];
- Australia [See § 126.16];
- The United Kingdom [See § 126.17]

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The Lunar Legal Landscape: Challenges and Opportunities

Tanja Masson-Zwaan* & Mark J. Sundahl**

This article provides an overview of the current legal landscape for lunar missions and summarizes various initiatives and developments at both the national and international level that complement the existing regulatory framework in this field. The authors tie all these elements together in an effort to give an outlook on the prospects for a sustainable lunar legal landscape in a realistic format and timeline.

Keywords: Space law, space policy, lunar exploration, space resources, UNCOPUOS

1 INTRODUCTION

Multiple missions to the Moon and cislunar space are currently in progress or are planned for the coming years by a number of countries and regional space agencies, including the European Space Agency, China, India, Russia, South Korea, and the United States (together with the, so far, eight signatories of the Artemis Accords).[1] In addition, a number of private actors are planning lunar missions either independently or in public-private partnerships, including Astrobotic, Intuitive Machines, iSpace (with Draper Lab), and SpaceX. The purposes of these missions range from orbital remote sensing and orbital tourism, to resource prospecting and extraction and even the establishment of a permanent human presence on the Moon. Many of the surface missions will be concentrated around the south pole of the Moon where water ice is relatively plentiful.

With so many missions headed to the Moon, often operating in the same area, the time has come to refine the laws that will govern these lunar missions. However, before the international community can properly evaluate the need for legal reform, it is essential to first understand the state of existing law, both

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1 *See* s. 3.3. below for a list of Artemis Program partners.

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domestic and international. This article helps set the stage for such reform by describing the current lunar legal landscape as well as recent legal developments and initiatives. This landscape is evolving as these new initiatives take root and new initiatives are undertaken to ensure that the exploration, utilization, and settlement of the Moon moves forward in the spirit of international cooperation, mutual assistance, and peace.

How the community of space actors, and the international community at large, can move forward in refining and adding to the rules governing this expanding human activity on the Moon is complicated. The 'holy grail' of legal reform would be the conclusion of a multilateral treaty drafted under the auspices of the United Nations. Even if this does come to fruition one day, it would likely take a decade to develop a comprehensive binding instrument. The pace of technological development and political goals of settling the Moon is outstripping legal innovation, giving some urgency to current initiatives.

In the following section, this article will sketch out the existing fabric of international and domestic space law that is of particular importance to lunar missions. Section III describes a number of current initiatives, both domestic and international, that are addressing legal lacunae and setting the stage for further multilateral efforts to develop lunar law. Finally, the article closes with a summary of the current state of lunar law and observations about opportunities for the next generation of space law.

2 EXISTING COMPONENTS OF THE LUNAR LEGAL LANDSCAPE

In this section, an overview is given of international law (hard law and soft law) and national legislation that contain elements relevant for lunar governance. The section focuses on the *lex lata* at the time of writing.

2.1 UN TREATIES

Several of the United Nations treaties on outer space make reference to the Moon and other celestial bodies, the most relevant ones being the 1967 Outer Space Treaty (OST)[2] and the 1979 Moon Agreement.[3] A brief summary of their relevant provisions follows.

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[2] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (referred to as Outer Space Treaty or OST), opened for signature on 27 Jan. 1967, entered into force on 10 Oct. 1967, UNTS, vol. 610, No. 8843. The OST currently has 110 States Parties, *see*, https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/status/index.html (accessed 24 Nov. 2020).

[3] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (referred to as Moon Agreement or MA), opened for signature on 18 Dec. 1979, entered into force on 11 July 1984, UNTS, vol. 1363, No. 23002. Even though the Treaty was adopted by consensus in UNCOPUOS,

2.1[a] *The Outer Space Treaty*

The OST, known as the 'Magna Carta' of outer space is the foundational legal instrument governing the activities of States in outer space. The Moon is explicitly mentioned in every article of the OST, except Article VIII, which does however mention it implicitly by the words 'on a celestial body', and Articles XIV–XVII which deal with procedural matters. Article I provides that the exploration and use of the Moon must 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. States Parties are free to explore and use outer space, as long as the activities are in line with the provisions of the Treaty. This means for instance that activities on the Moon must be in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding (Article III). It also means that the Moon must be used 'exclusively for peaceful purposes' (Article IV). Lunar activities by private entities must be authorized and supervised by the 'appropriate State' (Article VI), launching States are internationally liable for damage caused on the Moon by their objects to another State Party, and States have jurisdiction and control over their registered space objects and personnel thereof (Article VIII).

Article II forbids the 'appropriation' of (parts of) the Moon, but does not explicitly specify whether extracting and commercializing lunar resources is in line with its provisions.[4] One of the tasks of a future lunar governance system will be to clarify this matter. A consensus seems to have emerged that resources are not covered by the non-appropriation principle.[5]

In terms of environmental protection, Article IX of the OST provides that States must explore the Moon in a manner that avoids its harmful contamination or adverse changes in the environment of the Earth resulting from the introduction of extra-terrestrial matter. States Parties are also obligated to enter into consultations

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the MA currently has eight States Parties, not including any of the space powers, *see*, https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/status/index.html (accessed 24 Nov. 2020).

[4] *See IISL Position Paper on Space Mining* (20 Dec. 2015, s. II.1.b), http://www.iislweb.org/html/20151220_news.html (accessed 24 Nov. 2020), and *see also* T. Masson-Zwaan & M. Hofmann, *Introduction to Space Law*, Ch. 7 (Kluwer 2019) and T. Masson-Zwaan & N. Palkovitz, *Regulation of Space Resource Rights: Meeting the Needs of States and Private Parties*, 35 QIL, Zoom-in 5–18 (2017).

[5] *See* e.g. F. Lyall & P. Larsen, *Space Law: A Treatise* 163–188 (2nd ed., Routledge 2018); F. Tronchetti, *Legal Aspects of Space Resource Utilization*, in *Handbook of Space Law* 769–813 (F. von der Dunk & F. Tronchetti eds, Elgar 2015); R. Jakhu & S. Freeland, *Article II*, in *Cologne Commentary on Space Law*, Vol. I, 44–63 (S. Hobe, B. Schmidt-Tedd & K. U. Schrogl eds, Heymanns 2009); M. Hofmann & F. Bergamasco, *Mining in Outer Space: Legal Aspects*, Eur. Y. B. Int'l Econ. L. 313–336 (2018); for a contrary view, *see* G. Oduntan, *Who Owns Space? US Asteroid-Mining Act Is Dangerous and Potentially Illegal*, The Conversation (25 Nov. 2015). *See also* s. 3.2 below, giving an overview of discussions in UNCOPUOS on this matter.

when harmful interference with the peaceful activities of another State Party may result from its activities. This article is often considered as the main basis for 'soft law' rules on space debris mitigation, which is addressed below, but does not impose a very strong legal obligation on States Parties. Articles X–XIII also mention the Moon but will not be further elaborated on here.

The OST is widely accepted by space powers and emerging spacefaring nations from all continents, which gives it considerable weight. Nevertheless, its provisions are, as the Treaty's title says, 'Principles' and thus not intended to provide all encompassing detail.

2.1[b] *The Moon Agreement*

For obvious reasons, the Moon Agreement makes reference to the Moon in each of its articles, except the procedural provisions in Articles 17–21. The treaty also applies to all other celestial bodies in the solar system other than the Earth, unless and until, for instance, a specific treaty for Mars or asteroids would enter into force. The Moon Agreement reiterates and reinforces many of the principles of the OST. It reiterates the 'province of mankind' principle in Article 4, but also provides in Article 11 (1) that the Moon and its natural resources are 'the common heritage of mankind' (CHM). This principle finds its expression in particular in Article 11(5), which mandates States Parties 'to establish an international regime, including appropriate procedures, to govern the exploitation of the natural resources of the moon as such exploitation is about to become feasible'.[6] Article 11(3) further specifies that 'neither the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person'. Although the States Parties to the Moon Agreement have thus committed to reach an international agreement to govern commercial mining activities, it is unclear whether this means that the obligation also covers preliminary stages, such as exploration and prospecting, and whether no commercial activity can take place before such an agreement is in place. Neither seems likely; indeed, a Joint Statement was issued by the States Parties in 2008, proclaiming that the

[6] The proper meaning of the CHM concept must be determined in the context of its use and for the purpose of the future applicable regulatory regime. States Parties must make good faith efforts to negotiate in order to reach an agreement, but the result of such negotiations could be a rejection of the concept or giving it a new scope, as has also happened in the field of the law of the sea. *See Cologne Commentary on Space Law*, vol. II, 395 (S. Hobe, B. Schmidt-Tedd & K. U. Schrogl eds, Heymanns 2013).

'common heritage of mankind' principle as embodied in the treaty does not constitute an obstacle to space mining initiatives.[7]

Regarding environmental issues, Article 7 of the Moon Agreement amplifies Article IX OST by stating, in part:

> In exploring and using the Moon, States Parties shall take measures to prevent the disruption of the existing balance of its environment whether by introducing adverse changes in that environment, by its harmful contamination through the introduction of extra-environmental matter or otherwise. States Parties shall also take measures to avoid harmfully affecting the environment of the Earth through the introduction of extra-terrestrial matter or otherwise.

Unfortunately, the impact of the Moon Agreement is limited as so far it has just eighteen States Parties, which include none of the space powers. It must however not be forgotten that the treaty was adopted by consensus in the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), including all space powers, and no State has ever withdrawn. To underline the consensus that has emerged about the legality of space resource utilization, reference can be made to the preamble of the treaty, which specifically mentions the benefits which may be derived from the exploitation of the natural resources of the Moon and other celestial bodies. However, much remains to be done to agree on the details of a multilateral framework to govern such activities.

2.2 Soft law

Besides the treaties, there are also several 'soft law' instruments that directly or indirectly address the Moon. Although these instruments are not legally binding, their legal effect should not be underestimated, as they may evolve into customary international law with sufficient state practice and *opinio juris*, and thus become binding on States.[8] Moreover, national space legislation often includes an obligation for private entities to comply with such instruments, making them binding under national law. To encourage this, UN General Assembly resolution 68/75 of 11 December 2013, containing recommendations to States on national legislation relevant to the peaceful exploration and use of outer space,[9] explicitly mentions several of these soft law instruments. A few that are relevant for the topic of this article are addressed below.

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[7] *Joint Statement on the benefits of adherence to the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies of 1979 by States Parties to that Agreement*, UN Doc. A/AC.105/C.2/2008/CRP.11 (2 Apr. 2008).

[8] *See* Statute of the International Court of Justice, Art. 38.

[9] UN Res. 68/74, Recommendations on national legislation relevant to the peaceful exploration and use of outer space, UN Doc. A/RES/68/74 (11 Dec. 2013).

2.2[a] *The Declaration of Legal Principles*

The 1963 'Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space' (Declaration of Legal Principles), adopted in 1963[10] forms the basis of the OST of 1967. The principles were later transposed into a treaty in order to have legally binding force. The wording of the Declaration of Principles and the OST are nearly identical, and although a UN resolution is of itself not legally binding, its consensus adoption by all UN Member States further reinforces the universal validity of the principles.

2.2[b] *The Space Benefits Declaration*

The 1996 'Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interests of All States, taking into Particular Account the Needs of Developing Countries'[11] (Space Benefits Declaration) is based on Article I of the OST, which makes it relevant for lunar missions, even though it does not make specific reference to the Moon. Besides reflecting the concerns of the developing countries and stressing the need to take their interests into special account in paragraph 1, it further provides that 'States are free 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' (paragraph 2), and that 'contractual terms in such cooperative ventures' should be 'fair and reasonable' and in 'full compliance with the legitimate rights and interests of the parties concerned'. Intellectual property rights are explicitly mentioned in this context. This resolution is of particular relevance in the context of the need to ensure equitable sharing of the benefits of lunar exploration and space resource utilization.

2.2[c] *The COSPAR Planetary Protection Policy*

The relevance of planetary protection in the context of lunar governance is growing as plans for lunar missions increase among both public and private actors. The Committee on Space Research (COSPAR) was established in 1958 by the International Council of Scientific Unions (ICSU) to provide scientific advice on matters concerning scientific space research to the UN and other organizations.[12] The COSPAR Bureau can set up Panels to study topics of interdisciplinary

[10] UN Res. 1962 (XVIII) (13 Dec. 1963).
[11] UN Res. 51/122 (13 Dec. 1996).
[12] ICSU is now named the International Science Council (ISC). Find further information about COSPAR at https://cosparhq.cnes.fr (accessed 24 Nov. 2020).

interest. Several of these deal with environmental aspects of space activities, such as the Panel on Potentially Environmentally Detrimental Activities in Space (PEDAS), the Panel on Exploration (PEX) and the Panel on Planetary Protection (PPP). The latter formulated the COSPAR Planetary Protection Policy, which was updated most recently in 2020.[13] It constitutes an international standard on procedures to avoid contamination in space exploration, and serves as a guide for compliance with the OST, specifically its Article IX. It addresses both backward and forward contamination and distinguishes five categories of space missions, based on the type of mission (e.g. flyby, orbiter, lander, or sample returns), and the interest of the target body for understanding the origins and evolution of life.

The Moon as a target body falls under Category II, meaning that it is 'a body of significant interest relative to chemical evolution but with only a remote chance that contamination could jeopardize future exploration'. Accordingly, the requirement for a lunar flyby, orbiter or lander mission is to submit certain documentation. If the lunar mission involves a return of samples to Earth, the mission will fall under Category V-Unrestricted, i.e. 'sampling from locations not of biological concern', in which case again, documentation is the only requirement.[14]

Space agencies traditionally follow the Planetary Protection Policy for their missions, and usually have planetary protection offices, which also adopt their own additional policies. For instance, NASA recently announced two 'Interim Directives' on planetary protection, one of which concerns the Moon.[15] Missions to the Moon's polar regions and to the Apollo landing sites will remain in Category II, whereas all other lunar missions will become Category I ('not of direct interest for understanding the process of chemical evolution or the origin of life') instead of Category II, meaning there are no requirements. Indeed, growing scientific insight requires a continuous evolution of planetary protection principles, and the increased interest in the Moon and the growing number and diversity of actors indicate a need for lunar governance to include planetary protection principles, and to ensure adherence by private actors.

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13 *See*, https://cosparhq.cnes.fr/scientific-structure/panels/panel-on-planetary-protection-ppp/ (accessed 24 Nov. 2020).

14 Masson-Zwaan & Hofmann, *supra* n. 4, Ch. 9. *See also Protecting the Environment of Celestial Bodies: The Need for Policy and Guidelines* (M. Hofmann, P. Rettberg & M. Williamson eds, IAA 2010).

15 *See* J. Foust, *NASA Implements Changes to Planetary Protection Policies for Moon and Mars Missions*, Space News (July 2020), https://spacenews.com/nasa-implements-changes-to-planetary-protection-policies-for-moon-and-mars-missions/ (accessed 24 Nov. 2020).

2.2[d] *The UN Space Debris Mitigation Guidelines*

Prior to the adoption of the UN guidelines on debris mitigation, space agencies from around the world had been collaborating in this field. The Inter-Agency Debris Coordination Committee (IADC) adopted debris mitigation guidelines in 2002.[16] These served as the basis for the discussions in UNCOPUOS, leading in 2007 to the UN General Assembly endorsement of the Space Debris Mitigation Guidelines previously adopted by UNCOPUOS.[17]

The UN guidelines use the same definition of space debris as the IADC guidelines: 'space debris is defined as all man-made objects, including fragments and elements thereof, in Earth orbit or re-entering the atmosphere, that are non-functional'. This seems to exclude debris on celestial bodies such as the Moon, and in fact the Moon is not even mentioned in the guidelines, although some of the seven guidelines could also be conceived as applying to celestial bodies, notably guidelines 1 (limit debris released during normal operations); 2 (minimize the potential for break-ups during operational phases); and 4 (avoid intentional destruction and other harmful activities). It may however be advisable to clarify this, and to address the particular characteristics of debris located on a celestial body, as opposed to in orbit. In contrast to orbital debris, waste will not eventually re-enter the earth's atmosphere, and so the usual debris disposal methods will have to be reassessed.[18]

2.2[e] *The UN Guidelines for the Long-Term Sustainability of Space Activities*

After nearly ten years of debate marked by political tensions, UNCOPUOS adopted twenty-one guidelines on the Long-term Sustainability of Space Activities (LTSSA) in 2019.[19] The long-term sustainability of outer space activities is defined as:

> the ability to maintain the conduct of space activities indefinitely into the future in a manner that realizes the objectives of equitable access to the benefits of the exploration and

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[16] IADC Space Debris Mitigation Guidelines, rev. 1, IADC-02-01, https://www.iadc-online.org/ (accessed 24 Nov. 2020), at 'documents' (Sept. 2007).

[17] UN Res. 62/217, International cooperation in the peaceful uses of outer space, UN Doc. A/RES/62/217 (22 Dec. 2007).

[18] *See* in this context A. Salmeri, *e.a., Waste Management for Lunar Resources Activities: Towards a Circular Lunar Economy*, 71st International Astronautical Congress, IAC-20-D4.5.16 (2020).

[19] Report of the Committee on the Peaceful Uses of Outer Space, UN Doc. A/74/20, para. 163 and Annex II (3 July 2019). For an overview of the work of UNCOPUOS on the Long-Term Sustainability of Space Activities, *see*, http://www.unoosa.org/oosa/en/ourwork/topics/long-term-sustainability-of-outer-space-activities.html (accessed 24 Nov. 2020). Consensus could not be reached on seven remaining guidelines, they can be found in UN Doc. A/AC.105/2018/CRP.21 (27 June 2018).

> use of outer space for peaceful purposes, in order to meet the needs of the present generations while preserving the outer space environment for future generations.[20]

The twenty-one non-legally binding, voluntary guidelines address the policy, regulatory, operational, safety, scientific, technical, international cooperation, and capacity-building aspects of space activities and are divided in four groups:

(1) Policy and regulatory framework for space activities (five guidelines);
(2) Safety of space operations (ten guidelines);
(3) International cooperation, capacity-building, and awareness (four guidelines);
(4) Scientific and technical research and development (two guidelines).

The guidelines do not explicitly mention the Moon, but will of course indirectly have an impact on lunar governance. The guidelines must be seen as a living document which will be periodically reviewed, revised or added to, so that they may continue to ensure the long-term sustainability of outer space activities.[21] States are now called upon to take measures to ensure that the guidelines are implemented to the greatest extent feasible and practicable, and various States have started reporting to the Subcommittee about their actions in that context. In 2019, a new working group on the topic was established under the Scientific and Technical Subcommittee of UNCOPUOS, where these discussions will be continued.[22] It would be advisable to take the guidelines into account when developing a lunar governance system.

2.3 Domestic laws

Beneath the umbrella of international law, many countries have enacted domestic legislation to implement their international obligations as well as to regulate (as well as nurture) their domestic space industry. When a private space industry emerges in a country, Article VI of the OST requires that the country authorize and continually supervise this private activity, as explained above in section 2.A.1. Even before a domestic industry emerges, some countries enact legislation in order to foster the growth of private activity by providing regulatory clarity. Generally speaking, domestic legislation is primarily dedicated to the creation of a process for licensing the launch of space vehicles and the subsequent carrying out of certain

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[20] Report of the Committee on the Peaceful Uses of Outer Space, UN Doc. A/74/20, Annex II.I.5 (3 July 2019).

[21] *See* P. Martinez, *UN COPUOS Guidelines for the Long-Term Sustainability of Outer Space Activities: Early Implementation Experiences and Next Steps in COPUOS*, 71st International Astronautical Congress, IAC-20-E.3.4.1 (2020).

[22] *See* UN Doc. A/74/20, para. 165.

traditional space activities, such as communications, broadcasting, remote sensing, and navigation.[23] These domestic laws typically do not address lunar activities. The exception to this rule is found in those countries that have legislated with respect to resource extraction, an activity that will necessarily take place upon the establishment of a permanent human presence on the Moon.

2.3[a] *United States*

The United States was the first country to enact legislation specifically addressing space resource activities. The centrepiece of Title IV of the 2015 *US Commercial Space Launch Competitiveness Act* (CSLCA) is the addition of section 51303 to the US Code. This new section allowed for those engaged in space resource activity to assert ownership rights over extracted resources[24]:

> A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States.

Although this legislation was a bold and unprecedented step forward for the future of space resource activity, the law fell short of its promise in certain respects. First of all, the law only recognizes the right of a 'United States citizen' to own space resources, which narrows the reach of the law and leaves uncertainty as to the rights of foreign entities who may come before a US court or administrative agency claiming a right to space resources.[25] Another shortcoming of the law is that it provides no clear process or mechanism for resolving one of the primary concerns of space mining pioneers: how will companies be protected from other operators (both domestic or foreign) who interfere with their planned or ongoing mining activity (i.e. 'claim jumping')? An earlier version of the draft law created a new civil action precisely for the resolution of conflicting claims.[26] Moreover, that version of the law instructed the judge presiding over such an action to issue judgment in favour of the party that was 'first in time to conduct the activity' – provided that the activity was 'reasonable for the exploration and utilization of [space] resources'. In effect, this would have created a 'first in time' system of establishing

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[23] *See* Mark J. Sundahl, *Regulating Non-Traditional Space Activities in the United States in the Wake of the Commercial Space Launch Competitiveness Act*, 42(1) Air & Space L. 29 (2017).

[24] 51 USC §51303.

[25] The phrase 'citizen of the United States' is defined as including, in addition to an individual with US citizenship, any company organized in the United States or a company organized in another country i.e. controlled by a US company or citizen. *Ibid.*, §50902.

[26] Space Resource Exploration and Utilization Act of 2015, H.R. 1508, 114th Congress (2015), www.congress.gov/bill/114th-congress/house-bill/1508/text (accessed 24 Nov. 2020).

priority rights to space resources. That said, the wording of this draft bill presented its own problems, including the difficulty of determining at what point a company's activity would lock in the company's priority rights. Would the remote identification of future mining sites qualify as an activity that was 'reasonable for the exploration and utilization of [space] resources', thus giving the company priority rights to the identified site?[27]

Although Congress ultimately decided not to create a new cause of action to protect mining claims, Title IV does instruct the President, through federal licensing agencies, to[28]:

> promote the right of United States citizens to engage in commercial exploration for and commercial recovery of space resources free from harmful interference, in accordance with the international obligations of the United States and subject to authorization and continuing supervision by the Federal Government.

In short, rather than creating a civil court action, Congress left it to federal agencies to ensure non-interference through its existing licensing processes. One way in which this could be done is by making all licenses conditional on the licensee not interfering with existing space resource activity. But would the licensing agency also prohibit the licensee from mining sites that have not yet been touched, but have been publicly identified as a future mining site by another company? How would the agency decide which future sites should be given such protection? Without further regulatory guidance, the agency would have to make an ad hoc determination which mining claims deserved protection and which did not. But this leads to an even more fundamental question: Which agency will make these determinations and enforce these conditions? Congress has not yet given any agency in the US government authority to license space resource activity or, for that matter, any other private activity on the Moon.[29] The likely candidates for receiving such authority are the Federal Aviation Administration Office of Commercial Space Transportation (FAA-AST), which currently issues launch and re-entry licenses in addition to licensing spaceports, and the Office of Space Commerce in the Department of Commerce, which currently licenses remote sensing activity, enforces export controls, and oversees space traffic management.

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[27] It has also been argued that the US missed an opportunity to create a broader solution to the problem of potential disputes over space resources by failing to provide for the mutual recognition of mining authorizations granted to commercial entities by foreign states as had been done for deep seabed mining. *See* Thomas E. Simmons, *The Unfortunate Provincialism of the Space Resources Act*, Space Rev. (25 Jan. 2016), www.thespacereview.com/article/2910/1 (accessed 24 Nov. 2020).

[28] 51 USC §51302. What type and how much activity would have been needed to trigger this protection was unclear.

[29] *See* Sundahl, *supra* n. 23.

2.3[b] *Luxembourg*

Two years after Title IV of the CSLCA took force in the United States, the *Law of 20 July 2017 on the Exploration and Use of Space Resources* was enacted by Luxembourg in order to provide regulatory clarity to the nascent space mining industry.[30] As a result, the Grand Duchy has become a hub of space resource activity.[31]

Like the US law, the core of the Luxembourg legislation is the recognition that '[s]pace resources are capable of being owned'.[32] (Note that in contrast to the US law, this ability to own space resources is not limited to citizens.) Beyond the recognition of ownership, the Luxembourg law states that 'no person can explore or use space resources without holding a written mission authorization from the minister or ministers in charge of the economy and space activities'.[33] In order to apply for an authorization, the applicant must either incorporate in Luxembourg or have a registered office in Luxembourg. This does not prevent foreign companies from seeking the protections of Luxembourg law – the entity need only form a subsidiary or open a registered office in Luxembourg.

The remainder of the law sets out the requirements and procedures for acquiring authorization. An authorization will only be granted if, and is made conditional on, the applicant showing (1) financial means, (2) robust internal governance and auditing systems, (3) the requisite skill, knowledge, and experience, and (4) the 'good repute' of its shareholders.[34] Once an authorization is issued, the law requires that it be worked.[35] The authorization will be withdrawn if the operator 'does not make use' of the authorization within thirty-six months of issuance. Likewise, the authorization will be withdrawn if work ceases for 6 months or more at any time.

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[30] Law of 20 July 2017 on the Exploration and Use of Space Resources ('Luxembourg Law'). Although the English version of the law will be quoted in this article, it should be noted that the French version is authoritative. The English text, https://space-agency.public.lu/en/agency/legal-framework/law_space_resources_english_translation.html. The French version, http://legilux.public.lu/eli/etat/leg/loi/2017/07/20/a674/jo (accessed 24 Nov. 2020).

[31] Luxembourg had previously enacted the Law of 1991 on Electronic Media which established that a license is required to operate a satellite telecommunications system in Luxembourg. At the time of writing, a general space law is in the final stages of the parliamentary process in Luxembourg which will establish 'general rules on compliance with international law and environmental protection, including space debris'. In addition to establishing a domestic registry for space objects, the new law will also 'set up a system of authorization, monitoring and sanctions'. *See*, https://space-agency.public.lu/en/agency/legal-framework.html (accessed 24 Nov. 2020).

[32] Luxembourg Law Art. 1.

[33] *Ibid.*, Art. 2(1).

[34] *Ibid.*, Arts 7–11.

[35] *Ibid.*, Art. 14.

Unlike the US law, there is no mention in the Luxembourg law of the need to avoid harmful interference with the activity of other operators. However, the law does provide for the operator's liability for damage caused by its activities:

> The operator that is granted an authorisation for a mission is fully responsible for any damage caused at the occasion of the mission, including at the occasion of all preparatory works and duties.

In addition to imposing potential liability on authorized actors, the law imposes steep penalties (e.g. EUR 1 million per day), and even prison time, for conducting space resource activity without authorization or in contravention of the conditions of an authorization.

As under the US law, the question arises how Luxembourg will protect the interests of companies engaged in space resource activities, in particular, the interest of a company in mining a site that it has previously identified through remote sensing. It would be easy enough for Luxembourg to require as a condition of its authorizations that the authorized party not interfere with another entity's ongoing operations on the Moon. But does the law protect future mining sites from being poached by another company?

An answer to this question may lie in a provision of the Luxembourg law that mentions 'preparatory works' of mining companies, which would presumably include the remote prospecting for, and selection of, potential mining sites. By bringing 'preparatory works' into the scope of the law with respect to an operator's harmful actions, it is not a large jump to say that the party whose 'preparatory work' is damaged through harmful interference with a site selected by another mining concern could have an action for liability. In other words, could an operator who has plans to mine a particular site on the Moon (and made these plans public) sue for damages if another party authorized by Luxembourg harms the planned operation by poaching the site and mining it itself? Unfortunately, it is still unclear what the nature and breadth of the authorization conditions will be and how the courts will react to such a theory of liability. To end on a high note, however, Luxembourg does have the advantage over the US regulatory system in that the Luxembourg law makes a clear grant of authority to authorize space resource activity to the 'minister or ministers in charge of the economy and space activities'.

2.3[c] *Two Other Examples of Domestic Legislation: Japan and the UAE*

So far, two other countries, Japan and the United Arab Emirates (UAE), have made changes to their law or administrative processes in order to accommodate and encourage space resource activity. In Japan, the change was minimal and

merely consisted of a small change to a licensing application (rather than to the law itself). Specifically, in the application form for a license to operate a satellite (Form 17), the question regarding 'the purposes and methods of using the spacecraft' has been changed so that applicants now select from a number of choices, one of which is 'Space Science and Exploration (including space resources exploration)'. This amendment makes clear that space resources exploration is a lawful activity under Japanese law. However, Japanese law continues to be silent on issues relating to protections against harmful interference with space resource activity or priority rights to mining sites. That said, as is the case in the US and Luxembourg, the Japanese authorities could include a prohibition against harmful interference with the activity of others in the conditions of a license. The Japanese case highlights the fact that merely because a country's domestic laws do not expressly permit for space resource activity does not necessarily mean that such activity is prohibited. The change in the application format, although subtle, is a clear indication that space resource activity is permissible under Japanese law.

The UAE has taken a more formal approach in its *Federal Law No. (12) of 2019 on the Regulation of the Space Sector*, an omnibus national space law that contains an Article 18 on 'Exploration, Exploitation and Use of Space Resources'. Like the Luxembourg law, Article 18 grants clear authority to the Council of Ministers to regulate space resource activity. More specifically, the law gives the Council the authority to issue permits 'for the exploration, exploitation and use of Space Resources, including their acquisition, purchase, sale, trade, transportation, storage and any Space Activities aimed at providing logistical services in this regard'.[36] The legal effect of this article is perhaps greater than it first appears. Although the article appears to merely be a grant of authority to regulate, it contains within it two critical presuppositions: first, that the extraction of space resources is permissible under the UAE's interpretation of international law and, second, that extracted resources can be privately owned.

3 CURRENT INITIATIVES AND DISCUSSIONS

In this section, several initiatives addressing the *lex ferenda* for lunar governance will be highlighted, and an overview of discussions in UNCOPUOS will be given.

[36] UAE Federal Law No. (12) of 2019 on the Regulation of the Space Sector, https://u.ae/en/about-the-uae/science-and-technology/key-sectors-in-science-and-technology/space-science-and-technology (accessed 24 Nov. 2020).

3.1 The Hague Building Blocks for the Development of an International Framework on Space Resource Activities

The multi-stakeholder 'The Hague International Space Resources Governance Working Group' was created in 2016 as the outcome of a Roundtable on the Governance of Space Resources, convened by The Hague Institute for Global Justice in December 2014. The Working Group concluded its work at the end of 2019 with the adoption of twenty 'Building Blocks for the Development of an International Framework on Space Resources Governance'.[37] The Building Blocks aim to lay the groundwork for potential future negotiations on a framework to govern space resource activities. A Commentary to the Building Blocks was published in 2020 to provide background about the formulation of the Building Blocks and to analyse the legal basis and discussion behind each provision.[38] The Working Group included members and observers from space agencies, industry, academia, science, international organizations and civil society. The group felt that a future international framework should create an enabling environment for space resource activities that takes into account all interests, and benefits all countries and humankind.

The Building Blocks are based on the concept of 'adaptive governance', meaning that they do not try to address all aspects from the start, but should evolve on the basis of growing insight and understanding. A prime example of the application of this concept is that the Building Blocks only address the use of resources in outer space, and not their eventual return to earth.

The Building Blocks include technical, legal, scientific, industrial, business and social perspectives, thus reflecting the multifaceted character of space resource utilization. They include definitions of key terms, provisions regarding access to

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[37] The Working Group was hosted by the International Institute of Air and Space Law at Leiden University. Funding for the functioning of the group and for administrative support was provided by the Dutch government with contributions by Secure World Foundation and Deep Space Industries, later joined by the University of Luxembourg, Nishimura & Asahi, and ispace. *See* for more information about the Working Group, such as links to the Final Reports, the text of the Building Blocks, meeting reports, lists of members and observers and more, https://www.universiteitleiden.nl/en/law/institute-of-public-law/institute-of-air-space-law/the-hague-space-resources-governance-working-group (accessed 24 Nov. 2020). Five papers with annual updates were published between 2017 and 2020, *see* T. Masson-Zwaan et al., *The Hague Space Resources Governance Working Group: A Progress Report*, Proc. Int'l Inst. Space L. 2016, 163 (Eleven 2017); T. Masson-Zwaan et al., *The Hague Space Resources Governance Working Group: Second Progress Report*, Proc. Int'l Inst. Space L. 2017, 281 (Eleven, 2018); T. Masson-Zwaan et al., *The Hague Space Resources Governance Working Group: Third Progress Report*, Proc. Int'l Inst. Space L. 2018, 761 (Eleven, 2019); T. Masson-Zwaan et al., *The Hague International Space Resources Governance Working Group: Final Progress Report*, 70th International Astronautical Congress, IAC-19-D4.5.1 (2019); T. Masson-Zwaan et al., *The Hague International Space Resources Governance Working Group: Conclusion and Way Forward*, 71st International Astronautical Congress, IAC-20-D4.5.1 (2020).

[38] *See*, https://www.boomdenhaag.nl/en/webshop/building-blocks-for-the-development-of-an-international-framework-for-the-governance-of-space-resource-activities (accessed 24 Nov. 2020).

and rights over space resources, safety measures related to space resource activities, prevention and mitigation of their potentially harmful impact, sharing of benefits from space resource activities, and a number of general provisions. The Building Blocks also include provisions regarding the attribution of priority rights to operators to search and/or recover space resources *in situ* for a maximum period of time within a maximum area upon registration in an international registry as well as the establishment of safety zones to assure safety and to avoid any harmful interference with space resources activity.

The impact of the Building Blocks is still emerging, and as can be seen in the following sub-sections they have already influenced subsequent initiatives that further develop their content.

3.2 UNCOPUOS

In 2016, shortly after the adoption of the first national law on space resources utilization by the US, the Legal Subcommittee of UNCOPUOS adopted an agenda item titled 'General Exchange of views on potential legal models for activities in exploration, exploitation and utilization of space resources. This item was addressed in 2017, 2018 and 2019, but in 2020 the session of the Legal Subcommittee was cancelled due to the COVID-19 pandemic. This section provides a summary of the discussions at these sessions.

In 2017,[39] the discussions did not go into much detail. Belgium submitted a Conference Room Paper that was quite critical about commercial space resources utilization. It asked, for instance:

> what would be the purpose of prohibiting national appropriation of celestial bodies while allowing the same nations to exclusively determine the use of their resources, surely the most valuable and, hence contentious, part of celestial bodies? What would be the point of reserving celestial bodies' use to a universal purpose while letting some nations with the highest technological development take all the benefit of their resources?[40]

It was suggested that a broad debate should take place within the Legal Subcommittee as the appropriate forum, involving especially developing countries. The need for a multilateral approach and the need for national legislation to conform to the principles enshrined in the UN space treaties were mentioned in

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[39] Report of the Committee on the Peaceful Uses of Outer Space, UN Doc. A/72/20 (27 June 2017). *See also* Report of the Legal Subcommittee, UN Doc. A/AC.105/1122, paras 221–250. Some of the early reactions at UNCOPUOS were summarized by O. Bittencourt Neto & Th. Cheney at the *Symposium on Legal Aspects of Space Resource Utilization* held in Leiden on 17 Apr. 2016, *see*, https://www.universiteitleiden.nl/en/events/2016/04/symposium-on-legal-aspects-of-space-resource-utilisation (accessed 24 Nov. 2020).

[40] UN Doc. A/AC.105/C.2/2017/CRP.19.

this context. There were States who felt that national laws in this field could lead to the development of multiple incompatible national frameworks, which would pose a risk of conflicts among States and potentially impact the sustainability of outer space. Some States argued that the regulation of private sector actors in outer space is consistent with a State's international obligations under the OST, that the extraction of resources from the Moon or a celestial body is a 'use' within the meaning of and permitted by Article I of the OST, and that the principle of non-appropriation only applies to natural resources 'in place'. Accordingly, once such resources are removed, ownership rights can be exercised by States or private entities. But other States felt that exploitation of space resources is not covered by the concept of freedom of exploration and use, and that recognition by States of ownership rights over resources that were not at their national disposal would be in conflict with the non-appropriation principle in Article II of the Treaty.

In 2018,[41] two Conference Room Papers about The Hague Space Resources Governance Working Group were submitted, one by Belgium (as a follow-up to its 2017 paper) and one by The Netherlands.[42] In its paper, Belgium criticized the work of the Hague Working Group, by arguing:

> In the absence of any actual mandate received from States and of a formal mechanism ensuring their representation, Belgium does not acknowledge such initiatives as providing a 'forum for negotiations on an international framework'. We regret that the work of some experts, though potentially valuable, has been undertaken in a manner that, eventually, creates confusion and generates interference with the work of UNCOPUOS.

Belgium suggested that 'fundamental enquiries' should be carried out, and presented a list of five questions to that effect.

In a reaction to this criticism, it was stated that:

> the discussions on space resources in the Hague Space Resource Governance Working Group had been conducted in an open, inclusive and transparent manner, with the intention of producing a document containing building blocks that could contribute to the regulation of space resources for the consideration of States and the international community.[43]

It was suggested that all stakeholders, including both government and private actors, should closely cooperate, so that future activities would be developed in a proper and practical manner as well as in accordance with international law, and that it would be appropriate for such discussions to take place in the Legal Subcommittee. As in 2017, concerns were expressed about unilateral approaches,

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41 Report of the Committee on the Peaceful Uses of Outer Space, UN Doc. A/73/20 (5 July 2018). *See also* Report of the Legal Subcommittee, UN Doc. A/AC.105/1177, paras 229–265.

42 *See* UN Doc. A/AC.105/C.2/2018/CRP.8 and UN Doc. A/AC.105/C.2/2018/CRP.18, respectively.

43 UN Doc. A/AC.105/1177, para. 234.

which were considered likely to raise uncertainty over the validity and application of international law; these States considered that a regulatory regime for the exploitation of space resources should be developed within COPUOS and must be agreed to by the international community as a whole, taking into account the interests of all States. A proposal was made to create a working group with the mandate to develop and propose to the Legal Subcommittee alternative legal solutions capable of providing the legal certainty necessary for acts of exploration, exploitation and utilization of outer space resources, but the proposal was not adopted.

In 2019,[44] most delegations were of the view that an international legal framework is needed within which space resources activities could be undertaken, hence the discussion no longer centred so much on the legality of using resources, but focused on its modalities and governance. Principles of sustainable use, avoidance of harmful contamination, and efficiency were brought up as possible elements of such a framework, and the need for appropriate international safety standards as well as for international coordination to avoid competing interests and conflicts. Some States considered that national legislation which safeguard international obligations in general terms only was not sufficient to ensure compliance with the spirit of the OST, and that a situation of 'first come, first served' would create a de facto monopoly and would thus be in contradiction with the letter and spirit of the OST. Others argued that commercial space resources activities are consistent with the UN treaties and that the OST does not preclude such activities. The delegation of The Netherlands informed the Subcommittee about the work of the Hague International Space Resources Governance Working Group, and several delegations mentioned that this work was of great importance and that consideration of the Building Blocks for the governance of space resource activities would greatly enhance discussions in the Subcommittee.

The establishment of a working group was again proposed, this time by Greece and Belgium.[45] While some delegations supported the proposal, others were of the view that the Subcommittee should not move too quickly, as regulation might stifle innovation. There was discussion about the timeframe of the working group and its mandate. It was suggested that it should be open-ended and its scope should be comprehensive in terms of substance, and that possibly an assessment should be carried out of the scientific, technological, economic and financial capacities of the international community in the field of research,

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[44] Report of the Committee on the Peaceful Uses of Outer Space, UN Doc. A/74/20 (3 July 2019). *See also* Report of the Legal Subcommittee, UN Doc. (A/AC.105/1203, paras 239–267).

[45] UN Doc. A/AC.105/C.2/L.311, Working paper by Belgium and Greece containing a proposal for the establishment of a working group on the development of an international regime for the utilization and exploitation of space resources.

development and use of space resources prior to developing any legal framework. It was also suggested that the work of the Scientific and Technical Subcommittee and the Legal Subcommittee should be closely coordinated.

Although there was no agreement on the establishment of a working group, the Committee decided to hold 'scheduled informal consultations' and endorsed the nomination by Belgium and Greece of two co-moderators to lead these consultations during the fifty-ninth session of the Legal Subcommittee in 2020. It was further agreed that the co-moderators 'would present to States members of the Committee, in the intersessional period, a draft plan for the scheduled informal consultations containing proposed substantive topics for discussion and their rationale. States would be invited to provide comments accordingly'. The Secretariat would send out that draft plan, and responses from States would be sent to the co-moderators for their consideration.[46] The aim of these consultations will be:

> to have a broad and inclusive exchange of views on the future deliberations concerning the exploration, exploitation and utilization of space resources, including the possible establishment of a working group under the relevant agenda item, taking into account possible future coordination with the Scientific and Technical Subcommittee, as appropriate.[47]

The draft plan for the scheduled informal consultations, which are intended to be 'inclusive, impartial, comprehensive and transparent', was circulated to the COPUOS Member States, and the deadline for replies was set at 31 January 2020.[48] The draft plan contains procedural and proposed substantive topics for discussion. In terms of *process*, the co-moderators suggest to clarify the mandate for the discussions, summarize the inputs received, and establish the modalities for the conduct of the discussions. In terms of *substance*, the proposals cover the principles contained in the OST and their interpretation, as well as other relevant international space law regimes and treaty arrangements, relevant 'soft law' guidelines and relevant principles of general international law. Furthermore, it is suggested to address the role of domestic legislation and the relevance of work by experts, other entities, universities, space agencies and industry stakeholders as well as input from other groups such as The Hague Working Group. The ultimate aim is 'to identify the major fields of possible agreement and major issues regarding which delegations continue to fundamentally disagree' and to 'arrive at legal certainty and predictability for all public and private actors […] and to ensure the consistency thereof with applicable international law'.

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46 UN Doc. A/AC.105/1203, para. 278.
47 *Ibid.*, para. 279.
48 Copy on file with the authors.

As stated above, the 2020 session of the Legal Subcommittee was cancelled due to COVID-19, and the scheduled informal consultations are now expected to take place in 2021.

3.3 NASA's Artemis Accords

The Artemis Accords form the legal foundation for NASA's Artemis program, an international partnership of space agencies dedicated to returning humans to the Moon by 2024.[49] Although the mission to the Moon is the primary objective at this point in time, the Accords are intended to govern a broad array of missions on 'Mars, comets, and asteroids, including their surfaces and sub-surfaces, 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'.[50] The Accords ensure that, whatever the specific nature of NASA's cooperation with a particular space agency, all Artemis-related activity will comply with the fundamental principles of international law and certain best practices. The more detailed terms of NASA's cooperation with particular space agencies will be captured in separate bilateral agreements, all of which will incorporate the terms of the Accords by reference.[51] The obligations under the Accords will then flow down to any agencies or other parties acting on behalf of the contracting states (including, presumably, any private companies that are contracted to assist in the program).[52] The current signatories that signed the document on 13 October 2020 are Australia, Canada, Italy, Japan, Luxembourg, the United Arab Emirates, and the United Kingdom. Other states are invited to accede to the Accords simply by 'submit[ting] its signature to the Government of the United States'.[53] This was done by Ukraine on 15 November 2020.[54]

According to section 1 of the Accords, their underlying purpose is 'to increase the safety of operations, reduce uncertainty, and promote the sustainable and beneficial use of space for all humankind'.[55] The approach taken by the Accords to achieve these goals begins with the reiteration of certain core principles under existing international law, including (1) the obligation to use space exclusively for peaceful purposes, (2) the obligation to rescue astronauts and recover space objects,

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[49] The text of the Artemis Accords, https://www.nasa.gov/specials/artemis-accords/img/Artemis-Accords-signed-13Oct2020.pdf (accessed 24 Nov. 2020).
[50] Artemis Accords, s. 1.
[51] *Ibid.*, s. 2.1.
[52] *Ibid.*, s. 2.1(4).
[53] *Ibid.*, s. 13.3.
[54] *See*, https://ua.usembassy.gov/ukraine-becomes-the-9th-country-to-sign-the-artemis-accords/ (accessed 24 Nov. 2020).
[55] *Ibid.*, s. 1.

(3) the duty to act with due regard to the interests of others, and (4) the duty to seek consultation with the affected state if there is a possibility of harmful interference with that state's activities.[56] In fact, the international spirit of the Accords is undeniable. In addition to much of its content being drawn from existing treaties, the Accords strongly encourage multilateralism. In section 10, for example, the Accords require its signatories to participate in the multilateral development of international law 'including through ongoing efforts at the COPUOS'.[57]

Beyond merely confirming existing law, the Artemis Accords introduce some new ideas for implementing these legal obligations in an operational context.[58] Among the more innovative ideas in the Accords is the concept of 'safety zones' that a country would declare around their operations. The definition of 'safety zones' in section 11 of the Accords clarifies that these zones are merely for informational purposes to help to avoid interference[59]:

> In order to implement their obligations under the Outer Space Treaty, the Signatories intend to provide notification of their activities and commit to coordinating with any relevant actor to avoid harmful interference. The area wherein this notification and coordination will be implemented to avoid harmful interference is referred to as a 'safety zone'.

In other words, giving public notice of the location and nature of lunar activity (along with the parameters of a safety zone) is necessary in order to allow for the full implementation of the obligations under Article IX of the OST to act with 'due regard' to the interests of other space actors and seek consultation in the event of potential harmful interference.[60] A state can only operate with due regard to the extent that such state is aware of other lunar activities. If no notice of an activity is given, a state cannot expect to be protected by the duty of due regard. In contrast, by providing public notice pursuant to section 11 of the Artemis Accords, a state is protected by such notice because due regard requires the active avoidance of harmful interference.

How exactly these safety zones would be measured is left open by the Artemis Accords – as it should be. A variety of factors might influence the size of a safety zone. For example, the size of a safety zone could be significantly influenced by the nature of the activity. For example, the safety zone for a mining operation using explosives would require a relatively large zone – in contrast to an operation that merely scrapes ice off the surface of the Moon (which may not need much of a

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56 *Ibid.*, ss. 2 & 11(1) *et* passim.
57 *Ibid.*, s. 10.4.
58 The Accords were drafted, in part, to 'provide for *operational implementation* of important obligations contained in the OST and other instruments'. *Ibid.*, s. 1 (emphasis added).
59 *Ibid.*, s. 11.7.
60 *Ibid.*, s. 7.

safety zone at all). However, the Accords do provide the following basic principles to help determine the appropriate parameters of a safety zone[61]:

- 'A safety zone should be the area in which nominal operations of a relevant activity or an anomalous event could reasonably cause harmful interference'.
- 'The size and scope of the safety zone … should reflect the nature of the operations being conducted and the environment that such operations are conducted in…'
- 'The size and scope of the safety zone should be determined in a reasonable manner leveraging commonly accepted scientific and engineering principles'.

To encourage transparency in the methods and rationales for creating safety zones, every signatory to the Accords has the right to request the basis for the creation of a safety zone.[62] Finally, the Accords promote taking a multilateral approach in the future 'to further develop international practices, criteria, and rules applicable to the definition and determination of safety zones and harmful interference'.[63]

It should be kept in mind that safety zones serve two purposes. First, they protect other space actors by giving notice when there is a risk of harmful interference. If another actor conducts activities within the safety zone, a court may conclude that this was done at its own risk. On the other hand, one could argue that liability is more likely to be imposed if actors outside the safety zone suffer harm. Under the *Convention on International Liability for Damage Caused by Space Objects*, a state is liable for any damage caused in space by its own space object to another space object (or any persons or property onboard) 'if the damage is due to its fault or the fault of persons for whom it is responsible'. What constitutes 'fault' under a particular set of circumstances may be difficult to determine in light of the infancy of lunar activity and the lack of generally recognized standards of behaviour. However, the establishment of safety zones may assist in determining fault. The argument would be that if a state is operating within the safety zone established by another state and causes damage to the latter state's operations, the offending state could be found 'at fault' for irresponsibly operating within the safety zone.

Some commentators are concerned that the Unites States intend to treat safety zones as their exclusive property in contravention of the OST.[64] Such claims are in

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61 *Ibid*.
62 *Ibid*., s. 11.8.
63 *Ibid*., s. 11.6.
64 *See* e.g. A. Boley & M. Byers, *U.S. Policy Puts the Safe Development of Space at Risk*, Sci. 174 (9 Oct. 2020).

fact contradicted by the language of section 11(10) where it is made clear that while notification and coordination is required, there is no prohibition against operating within a safety zone, but only a duty to give notice and coordinate[65]:

> The Signatories commit to respect reasonable safety zones to avoid harmful interference with operations under these Accords, including by providing prior notification to and coordinating with each other before conducting operations in a safety zone established pursuant to these Accords.

Again in section 11(11), the principle of universal free access is emphasized without restriction[66]:

> The Signatories commit to respect the principle of free access to all areas of celestial bodies and all other provisions of the Outer Space Treaty in their use of safety zones.

The Artemis Accords are a product of our times. NASA is supportive of UN initiatives to explore the possibility of new law governing lunar activity, but the UN process will likely take a decade or more to produce an agreement of any significance. In the meantime, NASA must move forward while the political will of Congress supports the Artemis program and should be respected for building a team of international partners who, through the Artemis Accords, promise to observe existing space law as a condition of joining the venture.

3.4 MVA BEST PRACTICES FOR SUSTAINABLE LUNAR ACTIVITIES

Rounding out the picture of the lunar legal landscape is the role of non-governmental entities that are engaged in initiatives to support the evolution of space law to facilitate the peaceful expansion of lunar activity. One such non-governmental organization is the Moon Village Association (MVA), which has engaged in a multilateral effort to develop an initial set of *Best Practices for Sustainable Lunar Activities*.

The MVA was incorporated in Vienna in 2017 with the goal of implementing the 'Moon Village' concept by serving as a hub of communication for stakeholders in the new international push to establish a permanent human presence on the Moon.[67] The concept of the Moon Village is a vision of peaceful global cooperation in lunar exploration and utilization. The concept contemplates a collection of international efforts that involve both governmental and non-governmental entities conducting activities in a spirit of cooperation and mutual assistance. In this

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[65] *Ibid.*, s. 11.10.
[66] *Ibid.*, s. 11.11.
[67] Further information about the Moon Village Association, www.moonvillageassociation.org (accessed 24 Nov. 2020).

vision, everyone is welcome to contribute to humanity's future on the Moon in accordance with their individual capabilities.[68]

The overarching goal of the Best Practices is to develop a set of voluntary standards of behaviour and principles that will ensure the long-term sustainability of lunar activities. Turning to their substance, the Best Practices include core principles for responsible lunar activity as well as provisions that encourage the creation of standards of behaviour to address the practical challenges of establishing a permanent human presence on the Moon. The Best Practices were drafted by the members of the MVA's Coordination & Cooperation Committee and draw on existing legal instruments and initiatives, including the existing space treaties, the UN Long-Term Sustainability Guidelines, and the Hague International Working Group's Building Blocks for an international framework for space resource activities. An earlier version of the Best Practices was opened for public consultation on 5 March 2020 for six months, during which time the MVA hosted a series of webinars to seek additional input on the Best Practices from all stakeholders, including government agencies, industry, academia, and members of the general public. After the close of the consultation period, a preliminary revised version of the Best Practices was the subject of a virtual roundtable discussion with representatives of nine space agencies before a final version was released on 19 October 2020.

The Best Practices take a multi-prong approach to refining the lunar legal landscape by (1) highlighting existing principles of international law that are of particular relevance to lunar missions, (2) suggesting how best to implement these principles on the lunar surface; and (3) suggesting certain innovations to supplement existing law.

The more innovative aspects of the Best Practices are found in those sections that suggest new standards for lunar activity, including the following:

- Encouraging the avoidance of harmful interference with existing (or planned) activities;
- Recommending how to satisfy the legal obligation to share benefits;
- Encouraging measures to (i) mitigate the creation of lunar orbital debris and (ii) avoid causing adverse changes to sites of significant scientific or historical interest on the Moon;
- Recommending the enhanced registration of space objects under the Registration Convention to provide information about the location and nature of lunar activity;

[68] For the roots of the Moon Village concept *see* Jan Wörner, *Moon Village: A Vision for Global Cooperation and Space 4.0* (2016), www.esa.int/About_Us/Ministerial_Council_2016/Moon_Village (accessed 24 Nov. 2020).

- Recommending limiting space resource activity as to location and duration in order to ensure equitable and responsible use of limited resources;
- Encouraging space actors to share information and best practices through an international publicly available database; and
- Suggesting that, in time, a dedicated registry of lunar activities should be established.

The Best Practices are not static, but will continuously evolve in step with the development of lunar activity. The next phase of this project will be entrusted to a new expert group, the Global Expert Group on Sustainable Lunar Activities (GEGSLA), whose membership is to be drawn from thought leaders in government, industry, and academia.

3.5 Vancouver recommendations and open letter on space mining

In March 2020, the Outer Space Institute (OSI) at the University of British Columbia in Vancouver, Canada, organized a transdisciplinary roundtable with participants from a wide range of countries and backgrounds, including government, industry, and academia. The discussions at this meeting led to the adoption of the 'Vancouver Recommendations on Space Mining'.[69] They should not be seen as an alternative, rather, they 'are intended to support other recommendations and guidelines, most notably the "Building Blocks" adopted by The Hague International Space Resources Governance Working Group in November 2019'. The recommendations focus on an international regime for space mining and provide that negotiations to that effect should be open to all States and seek input from science, industry and other non-governmental stakeholders. The recommendations consist of seven points, the last of which contains twenty-five items that States should consider during such negotiations. These are in some instances similar to what is contained in The Hague Building Blocks, but seem to place a stronger focus on environmental and scientific aspects. For instance, they not only recommend compliance with the COSPAR planetary protection policy, but also the elaboration of further planetary protection standards specific to space mining. They also mention avoidance of potentially hazardous orbital changes to celestial bodies; securing samples in a manner that is compatible for eventual return for scientific research prior to extraction; and minimizing the lifting and transport of lunar dust. In respect of benefit sharing, the Vancouver recommendations go

[69] *See*, http://www.outerspaceinstitute.ca/docs/Vancouver_Recommendations_on_Space_Mining.pdf (accessed 24 Nov. 2020).

further than The Hague Building Blocks, as they encourage the establishment of a mandatory benefits sharing mechanism, including the sharing of monetary benefits.

The Vancouver Recommendations led to a follow-up initiative in August 2020, when an 'International Open Letter on Space Mining' was sent to the UN Secretary-General, stressing the need for a multilateral agreement on the exploration, exploitation, and utilization of space resources and calling on States to present a resolution at the UN General Assembly that urges UNCOPUOS to negotiate such an agreement. It specifically states:

> It is our opinion that the speed and scale of developments relating to the exploration, exploitation and utilization of space resources require more affirmative and urgent action. The undersigned therefore urge States to present for adoption at the United Nations General Assembly, a resolution which would request UNCOPUOS to negotiate, with all deliberate speed, a draft multilateral agreement on space resource exploration, exploitation and utilization for consideration by the General Assembly.[70]

The letter was signed by numerous persons, including several Nobel laureates and former ministers. Some members of the Hague Working Group also signed, but a number of space lawyers declined, including the authors of this article.[71] The international impact of this letter remains to be seen, but it has possibly had some influence on the negotiations on the recent Artemis Accords, which Canada has signed.

4 CONCLUSION AND THE WAY FORWARD

As has become clear from the above, the future lunar legal landscape may well comprise international and national law evolving in parallel, at least for the near future. The OST provides general principles and does not seem to prohibit commercial use of space resources; the Moon Agreement is more detailed but of limited relevance because of the low number of ratifications. International soft law fills in some of the details, especially in terms of sustainability, planetary protection and debris mitigation, but leaves other issues open. The development of national laws has so far been limited to a few cases, and these laws are more or less consistent and do not contradict international law. Moreover, they are necessary for States where space resources activities are expected to occur, as States Parties to the OST are under the obligation to authorize and supervise such space activities

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[70] *See*, http://www.outerspaceinstitute.ca/docs/InternationalOpenLetterOnSpaceMining.pdf (accessed 24 Nov. 2020).

[71] One reason being that the topic is already on the agenda of COPUOS as the prime forum for space law making, and it is preferable to await the results of the 'scheduled informal consultations' and the establishment of a working group, as envisaged.

pursuant to Article VI. It is however not desirable that many more States revert to unilateral lawmaking, as that might lead to a scattered legal landscape.

Without a doubt, the preferred solution is a multilateral regime for lunar activities including space resources activities, and several initiatives have started to formulate elements that may be useful in that regard. The primary forum for agreeing on a multilateral framework is UNCOPUOS. This will be a complex and lengthy process, but as evidenced by the recent adoption of the long-term sustainability guidelines, it is not impossible. During the first years of discussions on this topic in the Legal Subcommittee, a shift has already occurred from questioning the very legality of space resources utilization towards a gradual conviction that this activity will be happening and should be regulated internationally.

During the 2021 Legal Subcommittee meetings, the scheduled informal consultations will take place in accordance with the draft plan of the co-moderators and the input from Member States received so far. These consultations will hopefully lead to the establishment of a Working Group with a concrete mandate and timeline, including the task to consider the relevant preparatory work that has taken place these past years. The Building Blocks of the Hague Working Group had already been submitted for the subsequently cancelled 2020 session by The Netherlands and Luxembourg as a formal working paper and are available in all six UN languages.[72] Likewise, the US is expected to submit the Artemis Accords for the 2021 session, as per section 10.4. The MVA Best Practices will also be submitted either as a working paper by one or more delegations or as a Conference Room Paper by the MVA, which has permanent observer status. Any follow up to the Vancouver Recommendations and the UN Open Letter on Space Mining should also be taken into account. Furthermore, as has already emerged during previous sessions, the input of the Scientific and Technical Subcommittee should be sought, as well as, ideally, that of industry. The plethora of prior analysis and possible options should assist Member States in making good progress in a reasonable timeframe.

As the adoption of a new treaty is not likely in the current geopolitical climate, the eventual result of the discussions in UNCOPUOS might take the form of a General Assembly resolution providing guidelines for equitable and sustainable lunar activity by governmental as well as non-governmental actors, accompanied by recommendations to States wishing to adopt national legislation in this field. In the end, reaching international agreement in this promising new area of space activity will benefit all stakeholders.

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[72] UN doc. A/AC.105/C.2/L.315 (3 Feb. 2020), https://www.unoosa.org/oosa/en/ourwork/copuos/lsc/2020/index.html (accessed 24 Nov. 2020).