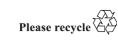
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English only

Committee on the Peaceful **Uses of Outer Space** Legal Subcommittee Sixty-third session Vienna, 15-26 April 2024 Item 9 of the provisional agenda* General exchange of views on potential legal models for activities in the exploration, exploitation and utilization of space resources

Australia - Input to the Working Group on Legal Aspects of **Space Resource Activities**

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^{*} A/AC.105/C.2/L.326.

Consideration of general themes and obligations, commitments or guidelines to an activity contributing to exploration and scientific investigation of the Moon

I. Introduction

- 1. At the 62nd session of the Legal Subcommittee, Australia, Austria and the Kingdom of the Netherlands submitted a paper providing relevant considerations for developing a set of initial recommended principles for the exploration, exploitation and utilization of space resources (A/AC.105/C.2/2023/CRP.6).
- 2. This present paper contextualises some general themes and obligations, commitments or guidelines of the existing framework, as identified in the aforementioned paper, by considering some that may apply to an activity contributing to exploration and scientific investigation of the Moon, to be conducted as part of the Trailblazer program under the Australian Government's Moon to Mars Initiative. The paper is intended to support considerations of the Working Group on Legal Aspects of Space Resource Activities, regarding the development of a set of initial recommended principles for activities in the exploration, exploitation and utilisation of space resources.
- 3. An example of some general themes and obligations, commitments or guidelines that may apply to the activities conducted as part of the Trailblazer program is included as Attachment A.

II. Background on the paper submitted by Australia, Austria and the Kingdom of the Netherlands (A/AC.105/C.2/2023/CRP.6)

- 4. The paper submitted by Australia, Austria and the Kingdom of the Netherlands (A/AC.105/C.2/2023/CRP.6) noted the establishment of the Working Group on Legal Aspects of Space Resource Activities at the 60th session of the Legal Subcommittee provides a timely forum to continue multilateral discussion.
- 5. The paper drew out general themes and extracted existing obligations, commitments or guidelines from four instruments that may be applicable to space resource activities: The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty), The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement), the Hague Building Blocks and the Artemis Accords.
- 6. The States Members submitting the paper were of the view that general themes can meaningfully inform considerations regarding the development of a set of initial recommended principles for activities in the exploration, exploitation and utilisation of space resources.

III. Background on the Trailblazer program

7. The Australian Government's Moon to Mars Initiative is a grants program for the Australian private sector to develop new technology and contribute to the United States National Aeronautics and Space Administration (NASA) mission to return to the Moon and then Mars. The Initiative leverages Australia's strengths in robotics, remote operations and critical technology sectors. The Initiative includes three Australian Government investment programs: the Supply Chain program, Demonstrator program, and Trailblazer program.

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- 8. Drawing on Australia's world-leading remote operations expertise, the Trailblazer program is the flagship element of the Moon to Mars Initiative. The objective of the Trailblazer program is to develop foundation services rover solutions. Foundation services are operational activities that support exploration missions to build towards a sustained off-earth presence, and will ultimately support outposts. Demand for foundation services is recurrent, continuous or enduring in nature. Foundation services can include monitoring and inspection, planning and logistics, civil construction, materials transport and cargo handling, remote maintenance, component manufacture and assembly. These services are distinct from but complementary to mission critical systems (such as power, communications and life support).
- 9. Trailblazer Stage 1 is an open competitive grant opportunity for up to two non-Government Australian applicants to develop foundation services rover solutions through early mission phases to Preliminary Design Review. Stage 1 is scheduled for completion by September 2024. Trailblazer Stage 2 is a closed competitive grant opportunity to a single successful applicant, selected from Trailblazer Stage 1, to take their foundation services rover to launch and lunar operations phase. The successful applicant of Trailblazer Stage 2 will own and operate the rover.

Agreement with NASA

- 10. The Agency has signed an agreement with NASA to develop a mission concept for the Trailblazer Australian foundation services rover to collect and transfer lunar regolith to a NASA operated in situ resource utilization (ISRU) facility or equivalent representative systems for scientific and technical demonstration purposes. Further cooperative activities including the build, test, delivery of hardware and launch will be covered in a separate arrangement with NASA.
- 11. NASA and the Australian Space Agency (the Agency) are discussing the possibility of a flight to the lunar surface no earlier than 2026. It is anticipated that transport of the foundation services rover to the Moon will be via NASA's Commercial Lunar Payload Services program.

Trailblazer mission destinations and scenarios

- 12. The mission will involve several phases, including pre-launch (including integration and checkout), launch (including lunar transit, lunar descent, lander commissioning (followed by payload commissioning)), and lunar surface operations (including egress, operations and end of life activities). NASA will specify and confirm the land site during the pre-launch phase; it is expected it will be at the south pole of the Moon. Relevant licence/s need to be obtained.
- 13. Once the lander has touched down on the surface of the Moon, the rover will receive a go-ahead to prepare for deployment. After commissioning and checkout, the rover will be deployed to the lunar surface to conduct its mission for the remainder of the lunar day.
- 14. While on the surface of the Moon, the rover's primary task is to deliver lunar regolith to the ISRU facility or equivalent representative systems. This may involve the rover surveying the environment, finding an acquisition site, acquiring the regolith, transporting it to the regolith delivery zone and delivering it to the ISRU facility or equivalent representative systems. The rover will repeat this task until it has delivered a total amount of 2 kilograms (to be confirmed) of lunar regolith during the mission timeframe.
- 15. Other foundation services tasks, technology demonstrations or scientific investigations may be conducted (but not at expense of the primary task). Other tasks could include repeated loading and unloading of lunar regolith, constructing regolith stores, conducting remote asset inspection, performing surface preparation terrain assessment, shaping and/or rock clearing, and end of life task into the permanently shadowed regions.

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16. The rover will be decommissioned when the mission is complete and the lunar day has ended.

IV. Relevant considerations for developing a set of initial recommended principles for the exploration, exploitation and utilisation of space resources

- 17. This current paper contextualises the general themes and the obligations, commitments or guidelines identified in the aforementioned paper by examining their application to the Trailblazer program, an activity contributing to exploration and scientific investigation of the Moon.
- 18. In doing so, this paper seeks to demonstrate Australia's commitment to the development and implementation of rules and norms that seek to support the safety, stability and sustainability of outer space.
- 19. Australia is a founding Member of the Committee on the Peaceful Uses of Outer Space, a State Party to the five United Nations space treaties, including the Moon Agreement, and a founding signatory to the Artemis Accords. Australia's position is that the Artemis Accords are consistent with its international legal obligations, including under the Moon Agreement. Australia is continuing its consideration of the Hague Building Blocks.
- 20. Australia also participates in relevant international fora and initiatives considering legal and policy aspects of space resource activities to support information-sharing and deeper understanding of the framework relevant to these activities. This includes engagement with:
 - (a) The Working Group on Legal Aspects of Space Resource Activities;
- (b) The Working Group on the Status and Application of the Five United Nations Treaties on Outer Space;
- (c) Signatories of the Artemis Accords, including with regard to the importance of transparency and signatories' intent to provide information to the United Nations Secretary General, consistent with Article XI of the Outer Space Treaty
- (d) The Lunar Policy Platform, where Australia supported the 'Lunar Policy Priorities Report' as an important contribution to future approaches to lunar governance.
- 21. Relevant themes in the Outer Space Treaty, Moon Agreement, and Artemis Accords which may be applicable to the activities conducted as part of the Trailblazer program include, but are not limited to, due regard, cooperation, scientific investigation, deconfliction, exploration and use, benefit to mankind, interoperability, informing activities, jurisdiction and control, non-appropriation, safety zones, extraction and utilisation of space resources, environmental protection, and sustainability.

V. Conclusion

Australia is of the view that examining general themes within the Outer Space Treaty, Moon Agreement, and the Artemis Accords, as outlined in <u>Attachment A</u>, in the context of an activity contributing to exploration and scientific investigation of the Moon, can meaningfully inform considerations regarding the development of a set of initial recommended principles for activities in the exploration, exploitation and utilisation of space resources.

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Attachment A Considerations within the Outer Space Treaty, Moon Agreement, and Artemis Accords relevant to the 'Trailblazer program'

- As an activity contributing to exploration and scientific investigation of the Moon, consideration of the Trailblazer program provides an opportunity to look at existing obligations, commitments or guidelines that may be relevant. This table draws out general themes (see also A/AC.105/C.2/2023/CRP.6, submitted by Australia, Austria and the Kingdom of the Netherlands) and extracts some obligations, commitments or guidelines from the *Outer Space Treaty ('OST')*, the *Moon Agreement ('MA')* and the *Artemis Accords ('AA')*, that may be applicable to the planning and activities conducted as part of the Trailblazer program.¹
- The table below is not an exhaustive consideration of the legally and non-legally binding instruments which may be applicable to the planning and activities conducted as part of the Trailblazer program. Each of the instruments considered provide that States Parties or signatories shall carry on activities in the exploration and use of outer space, in accordance with relevant international law.² Obligations under other space treaties and instruments may be relevant but are outside the scope of this paper.

Phase	Description of Phase	Theme	Existing Obligation/Commitment/Guideline ³
All Phases	The Trailblazer Program includes the development, launch and operation of a foundation services rover, capable of collecting lunar regolith and delivering it to a NASA in-situ resource utilization facility on the moon.	Due regard	 OST, Article IX: In the exploration and use of outer space, including the moon and other celestial bodies, States Parties to the Treaty shall conduct all their activities, including the Moon and other celestial bodies, with due regard to the corresponding interests of all other States Parties to the Treaty. MA, Art 2: All activities on the moon, including its exploration and use, shall be carried out with due regard to the corresponding interests of all other States Parties. Art 4(1): Due regard shall be paid to the interests of the present and future generations as well as the need to promote higher standards of living and conditions of economic and social progress and development in accordance with the Charter of the United Nations. AA, Sec 11.1: The Signatories acknowledge and reaffirm their commitment to the Outer Space Treaty, including those provisions relating to due regard and harmful interference. Sec 11.3: Consistent with Article IX of the Outer Space Treaty, a Signatory authorizing an activity under these Accords commits to respect the principle of due regard

¹ This table does not purport to consider or apply to activities taken for the purposes of exploitation of natural resources, or activities taken when exploitation is about to become feasible.

² Outer Space Treaty Article III, Moon Agreement Article 2, Artemis Accords Section 3.

³ Note: The relevant sentence/aspect of each provision has been extracted for readability and brevity rather than the full text, which continues to apply.

Phase	Description of Phase	Theme	Existing Obligation/Commitment/Guideline ³
Thase	Description of Thase	Cooperation	OST, Art I: States shall facilitate and encourage international cooperation in [scientific] investigation. Art III: States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the Moon and other celestial bodies in the interest of maintaining international peace and security and promoting international cooperation and understanding. Article IX: In the exploration and use of outer space, including the Moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of cooperation and mutual assistance MA, Art 4(2): States Parties shall be guided by the principle of cooperation and mutual assistance in all their activities concerning the exploration and use of the moon. International cooperation in pursuance of this Agreement should be as wide as possible and may take place on a multilateral basis, on a bilateral basis or through international intergovernmental organizations. AA, Sec 13.1, Sec 2(b)): The Signatories commit to periodically consult to review the implementation of the principles in these Accords, and to exchange views on potential areas of future cooperation The Signatories' bilateral instruments
			referred to above are expected to contain other provisions necessary to conduct such cooperation , including those related to liability, intellectual property, and the transfer of goods and technical data.
		Scientific investigation	OST, Art I: There shall be freedom of scientific investigation in outer space, including the Moon and other celestial bodies, and States shall facilitate and encourage international co-operation in such investigation.
			MA, Art 6(1): There shall be freedom of scientific investigation on the moon by all States Parties without discrimination of any kind, on the basis of equality and in accordance with international law. Art 6(2): In carrying out scientific investigations States Parties shall have the right to collect on and remove from the moon samples of its mineral and other substances. Such samples shall remain at the disposal of those States Parties which caused them to be collected and may be used by them for scientific purposes . States Parties shall have regard to the desirability of making a portion of such samples available to other interested States Parties and the international scientific community for scientific investigation . States Parties may in the course of scientific investigations , also use mineral and other substances of the moon in quantities appropriate for the support of their missions.
		Deconfliction	OST, Art IX: If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities

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Phase	Description of Phase	Theme	Existing Obligation/Commitment/Guideline ³
			of other States Parties in the peaceful exploration and use of outer spaceit shall undertake appropriate international consultations before proceeding with any such activity or experiment
			MA, Art 8(3): Activities of States Parties [in the exploration and use of the moon anywhere on or below its surface] shall not interfere with the activities of other States Parties on the moon. Where such interference may occur, the States Parties concerned shall undertake consultations See also MA Art 5(2), discussed in Launch Phase: 'Informing Activities'.
			AA, see Sec 11 generally: including provisions on due regard, the avoidance of harmful interference, and the holding of consultations, the sharing of information, best practices, and the designation of safety zones.
		Exploration and use	OST, Art I: The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries Outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind
			MA, Art 2: All activities on the moon, including its exploration and use, shall be carried out in accordance with international law Art 3(1): The moon shall be used by all States Parties exclusively for peaceful purposes. Multiple other references to 'exploration and use' throughout the MA, see for example Art 4(1) and (2).
		AA, Sec 1: The purpose of these Accords is to establish a common vision via a practical set of principles, guidelines, and best practices to enhance the governance of the civil exploration and use of outer space with the intention of advancing the Artemis Programintended to increase the safety of operations, reduce uncertainty, and promote the sustainable and beneficial use of space for all humankind. The Accords represent a political commitment to the principles described herein, many of which provide for operational implementation of important obligations contained in the Outer Space Treaty and other instruments.	
	Be	Benefit to mankind	OST, Art I: The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind
			MA, Art 4(1): The exploration and use of the moon shall be the province of all mankind and shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development. Due regard shall be paid to the interests of present and future generations as well as the

Phase	Description of Phase	Theme	Existing Obligation/Commitment/Guideline ³
			need to promote higher standards of living and conditions of economic and social progress and development in accordance with the Charter of the United Nations. Art 11(1): The moon and its natural resources are the common heritage of mankind, which finds its expression in the provisions of this agreement AA, Sec 1: Adherence to a practical set of principles, guidelines, and best practices in carrying out activities in outer space is intended to increase the safety of operations, reduce uncertainty, and promote the sustainable and beneficial use of space for all humankind.
Pre-Launch Phase	The pre-launch phase includes integration and checkout.	Interoperability	AA, Sec 10: The Signatories recognize that the development of interoperable and common exploration infrastructure and standards, including but not limited to fuel storage and delivery systems, landing structures, communications systems, and power systems, will enhance space-based exploration, scientific discovery, and commercial utilization. The Signatories commit to use reasonable efforts to utilize current interoperability standards for space-based infrastructure, to establish such standards when current standards do not exist or are inadequate, and to follow such standards.
		Informing activities	MA, Art 15(1): States Parties shall give reasonable advance notice of a projected visit, in order that appropriate consultations may be held and that maximum precautions may be taken to assure safety and to avoid interference with normal operations
Launch Phase	The launch phase includes lunar transit, lunar descent, lander commissioning (followed by payload commissioning).	Jurisdiction and control	OST, Art VIII: A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. MA, Art 12(1): States Parties shall retain jurisdiction and control over their personnel, space vehicles, equipment, facilities, stations and installations on the moon.
		Informing activities	OST, Art XI: States Parties to the Treaty conducting activities in outer space, including the Moon and other celestial bodies, agree to inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities. On receiving the said information, the Secretary-General of the United Nations should be prepared to disseminate it immediately and effectively. MA, Art 5(1): States Parties shall inform the Secretary-General of the United Nations as well as the public and international scientific community, to the greatest extent feasible and practicable, of their activities concerned with the exploration and

Phase	Description of Phase	Theme	Existing Obligation/Commitment/Guideline ³
			use of the moon. Information on the time, purposes, locations, orbital parameters and duration shall be given in respect of each mission to the moon as soon as possible after launching Art 5(2): If a State Party becomes aware that another State Party plans to operate simultaneously in the same area of, or in the same orbit around, or trajectory to or around the moon, it shall promptly inform the other State of the timing of and plans for its own operations
			AA, Sec 4: The Signatories are committed to transparency in the broad dissemination of information regarding their national space policies and space exploration plans in accordance with their national rules and regulations.
			AA, (Sec 11.7(d)): The Signatories should promptly notify each other as well as the Secretary-General of the United Nations of the establishment, alteration, or end of any safety zone, consistent with Article XI of the <i>Outer Space Treaty</i> .
Lunar Surface Operations Phase	The lunar surface operations phase (including egress,	Non-appropriation	OST, Art II: Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.
operactive the renvir acquacquacquacquacquacquacquacquacquacqu	operations, end of life activities) may involve the rover surveying the environment, finding an acquisition site, acquiring regolith,		MA, Art 11(2): The moon is not subject to national appropriation by any claim of sovereignty, by means of use of occupation, or by any other means. Art 11(3): 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 organization, national organization or non-governmental entity or of any natural person.
	transporting it to the regolith delivery zone and delivering it to the ISRU facility or equivalent representative systems. This process will be repeated until 2 kilograms (to be confirmed) of regolith is delivered.		AA, Sec 10(2): The signatories emphasize that the extraction and utilization of space resources, including any recovery from the surface or subsurface of the Moon, Mars, comets, or asteroids, should be executed in a manner that complies with the Outer Space Treaty and in support of safe and sustainable space activities. The Signatories affirm that the extraction of space resources does not inherently constitute national appropriation under Article II of the Outer Space Treaty
		Responsibility	OST, Art VI: States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by nongovernmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of nongovernmental entities in outer space shall require authorization and continuing

Phase	Description of Phase	Theme	Existing Obligation/Commitment/Guideline ³
			supervision by the appropriate State PartyWhen activities are carried on by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties MA, Art 14(1): States Parties to this Agreement shall bear international responsibility for national activities on the moon, whether such activities are carried on by governmental or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in this Agreement. States Parties shall ensure that non-governmental entities under their jurisdiction shall engage in activities on the moon only under the authority and continuing supervision of the appropriate State Party.
		Jurisdiction and control	OST, Art VIII: A State Party on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the Earth MA, Art 12(1): States Parties shall retain jurisdiction and control over their personnel, space vehicles, equipment, facilities, stations and installations on the moon. The ownership of space vehicles, equipment, facilities, stations and installations shall not be affected by their presence on the moon.
		Safety Zones	AA, Sec 11.11: The Signatories commit to use safety zones , which will be expected to change, evolve, or end based on the status of the specific activity, in a manner that encourages scientific discovery and technology demonstration, as well as the safe and efficient extraction and utilization of space resources in support of sustainable space exploration and other operations. 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 Signatories further commit to adjust their usage of safety zones over time based on mutual experiences and consultations with each other and the international community.
		Extraction and utilization of space resources	AA, Sec 10.2: The Signatories emphasize that the extraction and utilization of space resources, including any recovery from the surface or subsurface of the Moon, Mars, comets, or asteroids, should be executed in a manner that complies with the Outer Space Treaty and in support of safe and sustainable space activities. Sec 11.11 [concerning safety zones]: The Signatories commit to the safe and efficient extraction and utilization of space resources in support of sustainable space exploration and other operations

Phase	Description of Phase	Theme	Existing Obligation/Commitment/Guideline ³
		Environmental protection	OST, Art IX: 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 MA, Art 7(1): 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.
		Sustainability	AA, Sec 10.2: The Signatories emphasize that the extraction and utilization of space resources, including any recovery from the surface or subsurface of the Moon, Mars, comets, or asteroids, should be executed in a manner that complies with the Outer Space Treaty and in support of safe and sustainable space activities
			Sec 11.2: The Signatories affirm that the exploration and use of outer space should be conducted with due consideration to the United Nations Guidelines for the Long - term Sustainability of Outer Space Activities adopted by the COPUOS in 2019, with appropriate changes to reflect the nature of operations beyond low -Earth orbit.
			Sec 11.11 [concerning safety zones]: The Signatories commit to the safe and efficient extraction and utilization of space resources in support of sustainable space exploration and other operations
Post-mission	This occurs after the mission has concluded.	Informing activities	OST, Art V: States Parties to the Treaty shall immediately inform the other States Parties to the Treaty or the Secretary-General of the United Nations of any phenomena they discover in outer space, including the Moon and other celestial bodies, which could constitute a danger to the life or health of astronauts. Art XI: States Parties to the Treaty conducting activities in outer spaceagree to inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities MA, Art 5(1): States Parties shall inform the Secretary-General of the United Nations as well as the public and international scientific community, to the greatest extent feasible and practicable, of their activities concerned with the exploration and use of the moon information on the results of each mission, including scientific results, shall be furnished upon completion of the mission MA, 5(3): States Parties shall promptly inform the Secretary-General as well as the
			public and the international scientific community, of any phenomena [it] discover[s] in outer space, including the moon, which could endanger human life or health, as well as of any indication of organic life.

Phase	Description of Phase	Theme	Existing Obligation/Commitment/Guideline ³
			AA, Sec 4: The Signatories plan to share scientific information resulting from
			their activities pursuant to these Accords with the public and the international
			scientific community on a good-faith basis, and consistent with Article XI of the
			Outer Space Treaty.
			AA, Sec 8.2: The Signatories are committed to the open sharing of scientific data.
			The Signatories plan to make the scientific results obtained from cooperative
			activities under these Accords available to the public and the international
			scientific community, as appropriate, in a timely manner.
			AA, Sec 10.3: The Signatories commit to informing the Secretary-General of the
			United Nations as well as the public and the international scientific community
			of their space resource extraction activities in accordance with the Outer Space
			Treaty.