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Lacuna of Outer Space Law in Governing Space Tourism and Malaysia Stands

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Abstract: An advancement in space technology promises more excitement and enthusiasm for the explorer to exploit the outer space. And 21st century promises an irresistible offer to tourist to visit the outer space. An introduction to space tourism by International Space Station ('ISS') indirectly affected the application of law of outer space particularly in term of definition of space tourist, liability and non-appropriation of outer space. This article attempts to identify the lacuna of outer space law in governing the space tourism. From the critical analysis which has been done by the writer, the writer concluded that the current outer space law has lacuna in its application to space tourism. Therefore, the writer proposesa new international treaty or agreement to govern the space tourism.

Key words: Space tourism · Law of outer space · Space tourist · Liability · Non-appropriation

INTRODUCTION

Since the 1960s, approximately 500 astronauts have gone into outer space. By contrast, only a handful of (very wealthy) individuals have visited space as tourist [1]. It was not until the beginning of the 21st century that the concept of a 'space tourist' has actually become a reality. The law of outer space has developed as a discrete body of law within the international law. Since the launch of Sputnik 1 by the Union of Soviet Socialist Republican in October 1957, this process of evolution has been remarkably rapid, largely driven by the need of states to agree on rules to regulate activities in this new 'frontier' [2]. There is now a substantial body of international and domestic legal principles dealing with many aspects of the use and exploration of outer space. These principles are primarily to be found in a number of United Nations-sponsored multilateral treaties, UN General Assembly Resolutions, a wide range of national legislation, decisions by national court, bilateral arrangements and determinations by intergovernmental organisations.

There are five main multilateral treaties that have been finalisedthrought the UN Committee on the Peaceful Uses of Outer Space (UNCOPOUS) [2]which involved in the development of international space law. These are:

- Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies;
- Convention on International Liability for Damage Caused by Space Objects;
- Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space;
- The Moon Agreement; and
- Convention on Registration of Objects Launched into Outer Space.

In general terms, the international legal principles provide for the non-appropriation of outer space by any one state [3], the freedom of the use and exploration of outer space [4], the liability regime applicable in the case of damage caused by space objects [5, 6], the safety and rescue of space objects and astronauts [7], the prevention of harmful interference with space activities and with the environment [8], the notification to and registration of space activities with the UN [9] and the settlement of disputes arising from outer space activities [10].

It is also important to bear in mind that these treaties were formulated in the Cold War era. At the time they were finalised, it had certainly not been anticipated that humankind would engage in widespread commercial space

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tourism and, as a result, these treaties do not deal with such activities in any specific detail [1].

There are, in addition, five sets of principles adopted by the UN General Assembly each of which relates to specific aspects of the use of outer space. These are:

- Principles relating to Remote Sensing of the Earth from Outer Space;
- Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space;
- Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries;
- Principles Governing the Use by States of Artificial Earths Satellites for International Direct Television Broadcasting; and
- Principles relevant to the Use of Nuclear Power Sources in Outer Space.

However, these five sets of principles are considered as 'soft law' [11], although a number of specific provisions may now represent customary international law. The lack of international treaties and principles governing the space tourism activities is a major setback to the law of outer space. Thus, the objective of this paper is to assess the current law of outer space which is related to the space tourism and to identify the lacuna of outer space law in governing the space tourism.

Literature Review: Space Tourism, The Legal Perspective: The word "tourism" means travel for recreation or instruction, often in organized groups [12]. Space tourism is a term broadly applied to the concept of traveled beyond Earth's atmosphere by paying customers. It also means the practice of traveling into space for recreational purposes [13]. However, in outer space law, there is no such being as "person" in outer space. There are only astronauts and personnel [12]. Taken from legal perspective, there is real concern of definition of space tourist, liability and intellectual property which would have to be allayed before a space tourism program becomes a popular trend.

Non-contracting States: Under the Vienna Convention on the Law of Treaties, a State is not generally bound by a treaty obligation to which it is not a party [14]. Article 38, however, provides that a treaty can be binding upon non-Parties if it becomes customary rules of law [15]. However, in order to achieve customary international rules of law, two conditions must be fulfilled. Not only must the acts concerned amount to a settle practice, but they must also be such, or be carried out in such a way, as to be evidence of a belief that this practice is rendered obligatory by the existence of a rule of law requiring it. The need for such a belief i.e. the existence of a subjective element is implicit in the very notion of the *opinio juris sivenecessitaties*. The states concerned must therefore feel that they are conforming to what amounts to legal obligation [16].

Although the Rescue Agreement probably does not have the status of customary law, the Outer Space Treaty is widely regarded as customary international law [17]. Thus, states that are not parties to the Outer Space Treaty would nonetheless seem to be bound by the principles in Outer Space Treaty provided that the principles have achieved the status of customary international law. However, not all the principles listed down in the Outer Space Treaty and the other four major treaties qualify as customary international law. Therefore, states that are not parties to the five major outer space agreements will not bound by principles of outer space if those principles yet to achieve customary international law status.

Methodology: The present study attempts to analyze the current law of outer space in governing space tourism activities. The writer applied qualitative research with historical and comparative approaches. This paper is based on the critical analyzes of five main multilateral treaties: Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Convention on International Liability for Damage Caused by Space Objects, Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, The Moon Agreement and Convention on Registration of Objects Launched into Outer Space.

RESULTS AND DISCUSSION

The Legal Status of Space Tourists: Effort to clarify the legal status of crew and passengers can be found in legal documents concerning space travel to the International Space Station ('ISS'). For instance, the Inter-Governmental Agreement ('IGA') – an agreement reached between the space agencies participating in the ISS project – and the related Multilateral Crew Operations Panel Agreement ('MCOP Agreement') have divided

crewmembers into two main divisions: professional astronauts or cosmonauts and Space Flight participants. The former are defined in the MCOP Agreement as:

A professional astronaut/cosmonaut is an individual who has completed the official selectionand has been qualified as such at the space agency of one of the ISS partners and is employedon the staff of the crew office of that agency.

On the other hand, MCOP Agreement defined Spaceflight Participant as:

Individuals (e.g. commercial, scientific and other programs; crewmembers of non-partner space agencies, engineers, scientists, teachers, journalists, filmmakers or tourist(s) sponsored by one or more partner(s). Normally, this is a temporary assignment that is covered under a short-term contract [18].

Further, a distinction between 'expedition or increment crewmembers' and 'visiting crewmembers' has been clarified in the MCOP Agreement. The former are defined as 'the planned activities for an increment [crewmember]'. The latter are those who simply 'travel to and from the ISS, but are not expedition crewmembers'[18] and may also be referred to as a 'visiting scientist, commercial user or tourist' with limited functions [19]. Although the above definitions only apply to the ISS, Professor Frans von der Dunk believes that this distinction may constitute a 'trendsetting, if not an industry standard. The IGA's regulation in this matter has helped to develop soft law rules of a legally binding character, which appear to provide security and certainty in relation to passengers travelling to the ISS [19].

Article V of the Outer Space Treaty [20] describesastronautsas "envoys of mankind" and obliges states to provide astronauts with "all possible assistance in the event of accident, distress, or emergency landing on the territory of another State part or on the high seas. Should astronauts make such an emergency landing, they must be safely and promptly returned to the state of registry of the space vehicle. In contrast, with this qualified duty of states, Article V places a broader duty on astronauts by obliging them to provide "all possible assistance to each other" in any place and under any circumstances. The Rescue Agreement of 1968 specifically deals with the rendering of assistance to astronauts in the event of an accident, distress or emergency landing, the prompt and safe return of the astronauts and the return of objects launched into outer space [21]. The title and preamble of the Rescue Agreement refer to "astronauts" [22], while the text of the Rescue Agreement employs the broader term "personnel of a spacecraft" [23], which according to Zhao Yun, include astronauts, space engineers and scientists.According to him, "by using a broader concept in the text, the Rescue Agreement applies to broader categories of people on board spacecraft [24].However, the terms "astronauts" and "space personnel" have caused confusion in the Rescue Agreement as to whether both terms also include space tourists since the Rescue Agreement has not defined the meaning of "astronauts" and "space personnel".It is also important to bear in mind that Rescue Agreement were formulated in the Cold War era, when only a relatively small number of countries had space faring capability. At the time the Rescue Agreement wasfinalised, it had certainly not been anticipated that humankind would engage in widespread commercial space tourism and, as a result, this agreement do not deal with such activities in any specific detail [25].This uncertainty leads to the question of whether or not states have a duty to rescue space tourists as passengers (as opposed to astronauts and personnel) on a spacecraft.

Liability: The existing international space law is inadequateto regulate circumstances when a space tourist suffers injury, loss and damage, so as to remove current uncertainties surrounding the remedies that may be available and to ensure that proper risk avoidance procedures are implemented. Although it was contemplated that 'national activities in outer space' might be undertaken by non-governmental entities [26],the Outer Space Treaty provides that 'international responsibility' for such activities rests with states. This remains the position today, despite the fact that the range of space activities, as well as the number and type of private non-governmental participants involved in these activities, has grown exponentially [1]. Moreover, states are required by the terms of the Outer Space Treaty to authorize and continually supervise those national activities in outer space undertaken by non-governmental entities [26]. As these principles also reflect customary international law, they bind all states [17].On the other hand, the Liability Convention provides for more detailed rules where damage was caused by states as a result of their space activities. Article II of the Liability Convention makes provision for absolute liability in the instance of damage caused by a space object "on the surface of the Earth or to aircraft in flight".Article III of the Liability Convention furthermore determines that:

In the event of damage being caused elsewhere than on the surface of the Earth to a space object of one launching State or to persons or property on board such

a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.

The Liability Convention thus makes provision for a two-fold liability regime: in the instance where damage is caused by a space object on the earth or to an aircraft in flight, the state shall incur absolute liability, which is based not on fault but on risk. If the damage is caused in outer space, liability shall arise if fault is proven on the part of the state or the persons for whom it is responsible. Thus, if a space hotel and a space vehicle carrying space tourists collide in outer space, the launching states would be held liable if fault can be proven. And if the space vehicle shall fall on the territory of a non-launching state, the launching state would be held absolutely liable for damages incurred. It may, however, be argued that since space tourists voluntarily accept the inherent risks of space travel, the liability for damage incurred during the space activity should be limited in accordance with the assumption of risk [1].Although the Liability Convention does not specifically echo the contents of article IV regarding non-governmental entities,Article VI of the Outer Space Treaty clearly stated that the 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 non-governmental entities and for assuring that national activities are carried out in conformity with the provisions set forth in the present treaty. Therefore, it may be argued that the launching state must be held liable for the activities of private entities [27].

From the above analysis, it is clear that Outer Space Treaty and the Liability Conventiondo not make provision for liability of private entities undertaking space activities. The responsibility for such activities resides with the launching state, which must authorize and continuously supervise the outer space activities of private entities and which incurs liability for damage caused by these activities. Where damage, as defined in the treaty, is suffered by individuals, the procedures under the Liability Convention only allow for legal action to be taken by a relevant state [28]. Space tourists themselves are unable to claim compensation under the Liability Convention. Moreover, private space tourist operators will in all probability include clauses in the service contract to limit or exclude their liability for damages suffered by the space tourist. In addition, given the private contractual nature-between the operator and the tourist – by which most space tourism activities will take place, it is highly likely that carefully crafted 'exclusion of liability' clauses for death and injury will be included in the space tourism service agreement, although the domestic law principles in each state will dictate the extent to which such provisions might be enforceable [1]. Moreover, even though the domestic legislation of different states may seek to regulate the industry and provide for standards and protections, there is a danger that, without a uniform international law liability regime, the lack of uniformity will give rise to further uncertainty in this area [1].

The Non-appropriation Principle: The fundamental principle of 'non-appropriation' [3], upon which the international law of outer space is based, stems from the desire of the international community to ensure that outer space remains an area beyond the jurisdiction of any state(s) and for the common heritage of all mankind [29]. It is suggested by some commentators that the non-appropriation principle constitutes 'an absolute legal barrier in the realization of every kind of space activity. The amount of capital expenditure required to research, scope, trial and implement a new space activity is significant. To bring this activity to the point where it can represent a viable 'stand-alone' commercial venture takes many years and almost limitless funding. From the perspective of a private enterprise contemplating such an activity, this would quite obviously be an important element in its decision to devote resources to this activity that it is able to secure the highest degree of legal rights for the protection of its investment [1].

In relation to space tourism activities, not only intellectual property rights, but various forms of tangible property rights also become relevant. As space tourism activities develop, the demand will emerge for the constant presence of tourists on the Moon and other celestial bodies, necessitating the construction of celestial hotels. Therefore, it is important to have the ownership of such a structure. However, in the absence of sovereignty in outer space, it is not possible under existing international space law to assert that any particular jurisdiction applies to the area on which the hotel is to be constructed. The construction of a hotel on a celestial body raises uncertainties under current international space law principles. The Moon Agreement expressly provides that the surface (and subsurface) of the Moon 'shall not become property of any State, international intergovernmental or nongovernmental organization, national organization or nongovernmental entity or of any natural person [29]. Article II of the Outer Space Treaty clearly stated non appropriation of outer space by claim

of sovereignty. By placing a structure and hotel on the moon which subject to intervention by other states (since the non-appropriation principle prohibited the ownership of the surface of the moon), it will cause the competitiveness to occupy the surface of the celestial body including the moon and disputes amount the states. Therefore, a clear guideline pertaining to the property rights is needed in order to promote the space tourism.

Malaysia Stands: Malaysia as a developing state hassent the very first astronaut, Sheikh MuszapharShukor Al Masriebin Sheikh Mustapha to outer space on 10 October 2007. He was launched to the International Space Station aboard Soyuz TMA-11 [30]. Therefore, the status of Malaysia in the international level particularly in the outer space law will be scrutinized in order to analyses whether we are ready to involve actively in the exploration and exploitation of outer space. A State does not consent to be bound by a treaty merely by adopting or authenticating its text; it must do something further. Article 11 of the Vienna Convention on the Law of Treaties 1969 enumerates the ways in which a State can express its consent:

- By signature;
- By exchange of instruments constituting a treaty;
- By ratification, acceptance or approval; or
- By accession.

The effect of signature of treaty depends on whether or not the treaty is subject to ratification. If the treaty is subject to ratification, signature means no more than an authentication of its text. If the treaty is not subject to ratification, or is silent on this point, the better opinion is that, in the absence of contrary provision, the instrument is binding on signature [11].On the other hand, ratification is defined in the Vienna Convention as "the consent to be bound by a treaty" [31]. Ratification had been an essentially formal and limited act by which, after a treaty had been drawn up, a sovereign confirmed, or finally verified, the full powers previously issued to his representative to negotiate the treaty. It was then not an approval of the treaty itself but a confirmation that the representative had been invested with authority to negotiate it and, that being so, there was an obligation upon the sovereign to ratify his representative's full powers, if these had been in order [32]. In the case of outer space treaty, the instruments of ratification are to be deposited with the UN Committee on the Peaceful Uses of Outer Space (UNCOPOUS). In addition, accession is primarily the means for a State to become a party to a treaty if, for whatever reason, it is unable to sign the treaty. This may be because there is a deadline for signature and it has passed. Treaties frequently provide that they shall be open for signature for certain period. If a State wishes to become a party to a treaty after the expiration of the periods allowed for signature, it can do so by means of accession. The consent of a State be bound by a treaty is expressed by accession when the treaty provides that such consent may be expressed by that State by means of accession [33].

Until to date, Malaysia has ratified the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space [34],and signed the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies without further ratification [35]. However, Malaysia is non-party to the Convention on International Liability for Damage Caused by Space Objects [36], The Moon Agreement [37] and Convention on Registration of Objects Launched into Outer Space [38]. If we are ready to explore the outer space and send more astronauts and tourists to the outer space, drastic move has to be made by Malaysia in order to gain benefit and protect the country's interests from the existing treaties.

RECOMMENDATIONS AND CONCLUSIONS

Critically analyses to the outer space law in regard to the space tourism have shown that there is lacuna of law which needs further clarification and improvement in order to govern the space tourism industry. Liability must therefore be determined in terms of domestic laws. Due to the obvious importance of passenger for the success of the commercial space tourism industry, the exclusion of space tourists from protection under the Liability Convention become a crucial problem in protecting the space tourists. However, as private commercial space transportation evolves, state liability for these activities may become increasingly unacceptable. Due to the growing number of private space operators, it is self-evident that states would also seek to limit or exclude their liability for the actions of these private entities. A number of domestic systems have already adopted space-related legislation. In order to escape the financial liability for damages suffered by space tourists, these national laws may in some instances provide that the launching state

can recover the amount of damages for which it is internationally liable from the private launching operator. Some states already oblige private actorsenganging in space activities to indemnify the state should it become liable for damages [39].

A number of states also already require private companies who have launch and operational certificates or permits to obtain the necessary insurance to cover their space objects and launch facilities, as well as third party and product liability. Private companiesenganging in space tourism will thus most probably also in future have to acquire the necessary insurance to indemnify them in instances of claims by states to recover the damages suffered by space tourists and third parties [12]. In view of the fact that individuals are already acquiring seats on commercial spaceflights, the urgent need for a new space tourism insurance model in order to assess the unique risks involved and to ensure the payment of compensation is self-evident.From the above discussion it is clear that the current outer space legal regime does not adequately address the unique challenges relating to liability for damages suffered by space tourists. Liability issues are therefore increasingly regulated in national space legislation, which unfortunately exacerbates the international legal uncertainty in this regard. For all of these reasons it is preferable that, operating over and above the range of any relevant domestic legislation, a uniform and comprehensive regime for passenger liability arising from space tourism activities be developed at the international level. These new rules, developed as part of the international law of outer space, should allow for direct private claims by passengers and should operate from the moment of launch until the safe return to the scheduled final destination.

In regard to the meaning of astronaut and space tourist, there must be an internationally accepted guideline as to the differences between astronaut and space tourist which indirectly related to the Liability Convention. It is suggested that the future space tourism activities may also be the need for some other form of quasi-property rights associated with the construction of tourism related facilities on celestial bodies which may seem as an exclusive occupation of that part of the surface of a celestial body upon which a privately owned facility is built. Finally, Malaysia as a developing state which has sent our very first astronaut to outer space should take an initiative to accede five major treaties. Critical analysis to the outer space law in governing space tourism has shown that the outer space law still needs further clarification, amendment and new agreement is needed to cover the increasing high demand of space tourism. Therefore, international regime related to the space tourism has to be drafted in order to regulate the development of space tourism industry.

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3. Article II of the Outer Space Treaty states:- 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.
4. Article I of the Outer Space Treaty states:- The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in interests of all countries, irrespective of their degree of economic or scientific development and shall be the province of all mankind. Outer space, including the Moon and other celestial body, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law and there shall be free access to all areas of celestial bodies. 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.
5. Article II of the Liability Convention states:- A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft flight.
6. Article III of the Liability Convention states:- In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.

7. Article 2 of the Rescue Agreement states:- If, owing to accident, distress, emergency or unintended landing, the personnel of a spacecraft land in territory under the jurisdiction of a Contracting Party, it shall immediately take all possible steps to rescue them and render them all necessary assistance. It shall inform the launching authority and also the Secretary-General of the United Nations of the steps it is taking and of their progress. If assistance by the launching authority would help to effect a prompt rescue or would contribute substantially to the effectiveness of search and rescue operations, the launching authority shall co-operate with the Contracting Party with a view to the effective conduct of search and rescue operations. Such operations shall be subject to the direction and control of the Contracting Party, which shall act in close and continuing consultation with the launching authority.
8. Article IX of the Outer Space Treaty states:- 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 co-operation and mutual assistance and shall conduct all their activities in outer space, including the moon and other celestial bodies, with due regard to the corresponding interests of all other States Parties to the Treaty. States Parties to the Treaty shall pursue studies of outer space, including the moon and other celestial bodies and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and where necessary, shall adopt appropriate measures for this purpose. 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 of other States Parties in the peaceful exploration and use of outer space, including the moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment. A State Party to the Treaty which has reason to believe that an activity or experiment planned by another State Party in outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the moon and other celestial bodies, may request consultation concerning the activity or experiment.
9. Article II of the Registration Convention states:- 1. When a space object is launched into earth orbit or beyond, the launching state shall register the space object by means on an entry in an appropriate registry which it shall maintain. Each launching State shall inform the Secretary-General of the United Nations of the establishment of such registry.
10. Article IX of the Liability Convention states:- A claim for compensation for damage shall be presented to a launching State through diplomatic channels. If a State does not maintain diplomatic relations with the launching State concerned, it may request another State to present its claim to that launching State or otherwise represent its interests under this Convention. It may also present its claim through the Secretary-General of the United Nations, provided the claimant State and the launching State are both Members of the United Nations.
11. Soft law can be defined as a body of guiding principles, standards, rules of conduct, or declarations of policy, which are not strictly binding norms of law. Ademola, A., 2012. International Law, Text, Cases and Materials. Oxford University Press, New York.
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15. Article 38 of the Vienna Convention on the Law of Treaties states:- Nothing in Article 34 to 37 precludes a rule set forth in a treaty from becoming binding upon a third State as a customary rule of international law, recognize as such.
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. Commends the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, the text of which is annexed to the present resolution;
23. Article 1 of the Rescue Agreement states:- Each Contracting Party which receives information or discovers that the personnel of a spacecraft have suffered accident or are experiencing conditions of distress or have made an emergency or unintended landing in territory under its jurisdiction or on the high seas or in any other place not under the jurisdiction of any State shall immediately:
. notify the launching authority or, if it cannot identify and immediately communicate with the launching authority, immediately make a public announcement by all appropriate means of communication at its disposal;
. notify the Secretary-General of the United Nations, who should disseminate the information without delay by all appropriate means of communication at his disposal.
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25. Ferreira, S., 2014. A legal challenges relating to the commercial use of outer space, with specific reference to space tourism.Potchefstroom Electronic Law Journal, 17: 1-50.
26. Article VI of the Outer Space Treaty states:- 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 non-governmental entities and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty. When activities are carried on in outer space, including the moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.
27. Bruce, A.H., 1992. State Liability for Outer Space Activities in Accordance with the 1972 Convention on International Liability for Damage caused by Space Objects. Springer, Berlin, Heidelberg.
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29. Article 11 of the Moon Agreement states:-
. The moon and its natural resources are the common heritage of mankind, which finds its expression in the provisions of this Agreement, in particular in paragraph 5 of this article.
. The moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means.
. 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. The placement of personnel, space vehicles, equipment, facilities, stations and installations on or below the surface of the moon, including structures connected with its surface or

subsurface, shall not create a right of ownership over the surface or the subsurface of the moon or any areas thereof. The foregoing provisions are without prejudice to the international regime referred to in paragraph 5 of this article.

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. The consent of a State to be bound by the treaty is expressed by ratification when:
. the treaty provides for such consent to be expressed by means of ratification;
. it is otherwise established that the negotiating States were agreed that ratification should be required;
. the representative of the State has signed the treaty subject to ratification; or
. the intention of the State to sign the treaty subject to ratification appears from full powers of its representative or was expressed during the negotiation.

The consent of a State to be bound by a treaty is expressed by acceptance or approval under conditions similar to those which apply to ratification.

32. David Harris, Cases and Materials on International Law, Seventh Edition, [2010], Sweet and Maxwell, London.
33. Article 15 of the Vienna Convention on the Law of Treaties 1969 states:- The consent of a State to be bound by a treaty is expressed by accession when:

. the treaty provides that such consent may be expressed by that State by means of accession;
. it is otherwise established that the negotiating States were agreed that such consent may be expressed by that State by means of accession; or
. all the parties have subsequently agreed that such consent may be expressed by that State by means of accession. 49.

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