

**TWENTY YEARS AFTER
THE MOON AGREEMENT AND ITS LEGAL CONTROVERSIES**

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INTRODUCTION

The prospect of mining settlements and exploitation of natural resources on the moon or near-Earth asteroids capture the focus of human imagination everywhere. The 1979 Agreement Governing the Activities of States on the Moon and other Celestial Bodies¹ ("Moon Agreement") was designed specifically to address such a prospect and to provide for a universally acceptable legal régime for this inevitable development. The Moon Agreement received unanimous approval from the General Assembly of the United Nations in 1979 and has been signed by 14 states and ratified by nine of them.² Just as the disagreements between Alexandre Dumas' musketeers became more entrenched in *Twenty Years After*,³ the controversies relating to the Moon Agreement that have prevented its universal acceptance have shown no sign of abating.

In essence, the Moon Agreement reaffirms the principles that are well established in the other space treaties. For example, the prohibition of the military uses of outer space is provided for in Article IV of the 1967 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").⁴ However, disagreements over the creation of new obligations and responsibilities on the Moon and other celestial bodies as well as the prohibition of property rights have meant that the Moon Agreement has not been accepted by most states. This is especially so with respect to the provision that the moon is the "common heritage of

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¹ (1979) 1363 United Nations Treaty Series 3.

² Australia, Austria, Chile, Mexico, Morocco, Netherlands, Pakistan, Philippines and Uruguay have signed and ratified the Agreement. France, Guatemala, India, Peru and Romania have signed also but not yet ratified the Agreement.

³ 1993, Oxford University Press, Oxford.

⁴ (1967) 610 United Nations Treaty Series 205.

mankind”⁵ and the consequent provisions that entitles developing states to some form of profit sharing from activities in outer space.⁶ On this twentieth anniversary of the Moon Agreement, it is appropriate that the international community should review the issues and consider the future of the Moon Agreement.

EARLY CONTROVERSIES

Since the launch of Sputnik I in 1957, considerable success in the formulation and codification of the principles of outer space has been achieved within the framework of the United Nations. In 1961 the General Assembly recognised that international law, including the United States Charter, applied to outer space and that the Moon and other celestial bodies were not subject to national appropriation.⁷ In 1963 the General Assembly adopted the Declaration of Legal Principles Governing Activities of States in the Exploration and Use of Outer Space, as proposed by the Committee on the Peaceful Uses of Outer Space (“COPUOS”).⁸ Most of the principles embodied in the Declaration have become part of the Outer Space Treaty. Adding to the framework established by the Outer Space Treaty, COPUOS reached consensus on the Rescue Agreement in 1968, the Liability Convention in 1972 and the Registration Convention in 1976.⁹

These treaties provide the humanitarian obligations of mutual assistance, the imposition of third party liability upon launching states, and the creation of a United Nations register of space objects. The Moon Agreement expands on the principles embraced in the Outer Space Treaty, especially those on international cooperation and free access in outer space.

When Apollo 11 landed on the Moon in 1969, there was a realisation by the international community that the general principles in the Outer Space

⁵ Article 11 of the Moon Agreement.

⁶ See Hoffstadt, “Moving the heavens: lunar mining and the ‘common heritage of mankind’ in the Moon Treaty” (1994) 42 *University of California Los Angeles Law Review* 575, 598-605.

⁷ General Assembly Resolution 1721 (XIV).

⁸ General Assembly Resolution 1962 (XVIII).

⁹ 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched in Outer Space, 672 *United Nations Treaty Series* 119; 1972 Convention on International Liability for Damage Caused by Space Objects (“Liability Convention”), 961 *United Nations Treaty Series* 187; 1975 Convention on Registration of Objects Launched into Outer Space, 1023 *United Nations Treaty Series* 15.

Treaty were insufficient to regulate future exploitative activities on the Moon.¹⁰ Consequently it was generally accepted that a new treaty was needed. Argentina and the Soviet Union proposed draft treaties for the Legal Sub-Committee of COPUOS in 1970 and 1971 respectively.¹¹ Although agreement was reached on some provisions by 1972, there remained many issues that were not resolved until later in the decade.

The Soviet Union, along with Bulgaria, Egypt, France, Japan and Poland, were of the view that the Moon Agreement should deal with the moon only since it held a special place in the catalogue of objects in the solar system. United States, along with Australia, Belgium, Canada, Iran, Romania and United Kingdom supported the view that the agreement should apply to the moon and all celestial bodies.¹² In the end, agreement was reached that the Moon Agreement would apply to the moon and other celestial bodies until other treaties established regulations that were more specific in nature.¹³ This agreement became embodied in Article 1 of the Moon Agreement. The article provides that the provisions of the Agreement:

shall also apply to other celestial bodies within the solar system, other than the Earth, except insofar as specific legal norms enter into force with respect to any of these celestial bodies.

There was disagreement also within COPUOS regarding the scope of the Moon Agreement. Should it extend to other galaxies and should it extend to circumlunar space? With respect to the galaxies, despite the strong arguments of the United States, it was agreed that the Agreement would be limited in scope in relation to the solar system.¹⁴ As to circumlunar space, the problem was not with the concept but with the precise definition of

¹⁰ For example, this view was espoused in van Bogaert ERC, *Aspects of Space Law* (1986, Kluwer, Deventer) 76.

¹¹ See United Nations Doc A/AC.105/C2/L.71 and United Nations Doc A/8391.

¹² See Dausés, "Zun Rechtslage des Mondes und anderen Himmelskörper" (1975) 24 *Zeitschrift für Luftrecht und Weltraumrecht* 223; Matte, "Legal principles relating to the moon" in Jasentuliyana N and anor (eds), *Manual on Space Law* (1979, Oceana Publications, New York) 254-255.

¹³ See United Nations Doc A/AC.105/S.R.187-S.R.188; Beesley, "Canadian practice in international law during 1972 as reflected mainly in public correspondence and statements of the Department of External Affairs" [1973] *Canadian Yearbook of International Law* 294-295.

¹⁴ See United Nations Doc A/AC.105/196.

what circumlunar space encompassed. In the end, a formula was adopted, with Article 1 referring to orbits around or other trajectories to or around the Moon.¹⁵ Eventually, most differences over the wording of the Moon Agreement were resolved by consensus in COPUOS and the General Assembly approved the Agreement on 14 December 1979.

As a result of the above controversies regarding the Moon Agreement, states have been cautious and reticent in ratifying the agreement.¹⁶

DEFINING A CELESTIAL BODY

The first problem identified during the early stages of the debate in COPUOS related to the definition of "celestial body". Objects in the solar system including the planets, their natural satellites, as well as asteroids and meteorites, differ markedly in size and physical conditions. They range from solid objects such as the planet Mercury to liquid or gaseous objects that are wholly unsuitable for landings, such as Jupiter or the comets. Dr Gennady P Zhukov differentiated between bodies that may be objects of exploration and exploitation and others that are inappropriate for human activities due to their dimension, nature or substance.¹⁷ Since the treaties, and especially the Moon Agreement, refer repeatedly to space objects, a more precise legal definition should be advocated for the further development of space law.¹⁸

It has been argued that two distinct legal régimes should be created to regulate space objects depending on their dimensions and the composition of their surfaces. For some, a distinction based on the existence of a human economic value was seen as important, while others would criticise this as being contrary to the common interest principle already established in space law.¹⁹ Dr Gyula Gál suggests that where a solid surface exists for the

¹⁵ This was partly the result of the failure to make a spatial delimitation of circumlunar space: see Matte, "Legal principles relating to the moon" in Jasentuliyana N and anor (eds), *Manual on Space Law* (1979, Oceana Publications, New York) 258.

¹⁶ See note 2.

¹⁷ Zhukov GP, *Kosmicheskoye pravo* (1966, Moscow; 1968, German ed, *Weltraumrecht*, Berlin) 270-275. See also Marcoff, "La lune et le droit international" (1964) 68 *Revue Générale de Droit International Public* 248.

¹⁸ Gorbil, "Remarques sur la définition de l'espace extra-atmosphérique" (1978) *Proceedings of the 21st Colloquium on the Law of Outer Space* 89.

¹⁹ See Rusconi, "An essay on the lawful concept of heavenly bodies" (1966) *Proceedings of the 9th Colloquium on the Law of Outer Space* 55.

landing of space vehicles it is an important factor to be considered.²⁰ He stated:²¹

Under the aspect of space law (*sic*) celestial bodies are the moon, and the planets, moons, asteroids (or planetoids) of our solar system which are suitable for landing of manned or unmanned spacecraft, are of natural origin, and cannot be deviated from their celestial orbit. In the astronomical sense the concept of celestial bodies is much wider; the lawyer, however, is not interested in those which cannot become the scene of legally relevant actions, like the sun, our solar systems, comets etc.

Assuming that the definition of celestial bodies includes any landmass in space, including comets and tiny asteroids, Dr Ernst Fasan poses two interesting scenarios.²² First, if a comet or asteroid is discovered to cross Earth's orbit, it poses a threat to the Earth's environment as well as to the safety of astronauts. Although this would undoubtedly be "a phenomenon which could endanger human life" and would "reach the surface of the Earth by natural means", the Moon Agreement would apply to it as long as it has not reached the surface of the Earth.²³ The use of any technology to deflect such an asteroid or comet from its natural orbit and guide it towards the sun would raise few questions with respect to the necessity of the action. However, if one assumes that destruction is the ultimate form of appropriation, any state that destroys an asteroid or comet would, strictly speaking, contravene the provisions of the Moon Agreement.

Another example in which the definition of celestial body may be controversial is where an asteroid, with a diameter of few hundred metres, is captured and placed in orbit around the Earth, high above the geostationary orbit. The question that may be asked is whether the asteroid remains a natural celestial body even if it is hollowed out and its surface and interior covered with artificial installations and structures.²⁴ Dr Ernst Fasan suggests that this asteroid should then become an artificial "space

²⁰ Gál G, *Space Law* (1969, AW Sijthoff, Leyden) 186.

²¹ *Ibid.*

²² Fasan, "Asteroids and other celestial bodies – some legal differences" (1998) 26 *Journal of Space Law* 33.

²³ See Articles 1(3) and 5(3) of the Moon Agreement.

²⁴ Fasan, "Large space structures and celestial bodies" (1984) *Proceedings of the 27th Colloquium on the Law of Outer Space* 243.

object” to which notions involving ownership, control, registration and liability are applied differently.²⁵

Indeed, if the suggestion made by Working Group Three of the International Institute of Space Law in 1964 were accepted, celestial bodies would be defined as those that “cannot be artificially removed from their natural orbits”.²⁶ Until an appropriate definition is adopted, the scope and applicability of the Moon Agreement remains uncertain.

PROHIBITION OF MILITARY USES

Under the Moon Agreement, the Moon and other celestial bodies must be used exclusively for peaceful purposes. Any use of force, any threat of force or any other hostile act or threat of hostile act is prohibited on the Moon.²⁷ States cannot place any space objects containing nuclear weapons or other weapons of mass destruction in lunar orbits or trajectories.²⁸ There is also a prohibition on the establishment of military bases, installations, fortifications or any type of weapons testing or military manoeuvres.²⁹

Most scholars take the view that this is merely the reaffirmation of existing principles and obligations under the Outer Space Treaty. In that regard, the United States government has long argued that “peaceful” in this context means “non-aggressive” rather than “non-military”.³⁰ In other words, the United States continues to accept its obligations under the United Nations Charter to use space for non-aggressive purposes, but does not interpret its obligation to use outer space for peaceful purposes as preventing non-aggressive military uses.

This interpretation is contrary to accepted meanings in similar provisions in international law. For example, the word “peaceful” in the 1959 Antarctic Treaty³¹ means “non-military”.³² It would be absurd for states to assert that

²⁵ Fasan, “Asteroids and other celestial bodies – some legal differences” (1998) 26 *Journal of Space Law* 33, 40.

²⁶ Smirnoff, “Report from Working Group Three on the Law of Outer Space” (1964) *Proceedings of the 7th Colloquium on the Law of Outer Space* 352.

²⁷ Article 3 of the Moon Agreement.

²⁸ *Ibid.*

²⁹ *Ibid.*

³⁰ Christol, “The use of outer space for peaceful purposes: legal and political considerations” (1986) *Proceedings of the 28th Colloquium on the Law of Outer Space* 5-6.

³¹ 402 *United Nations Treaty Series* 71.

their manufacture of nuclear bombs are for “non-aggressive” purposes only, thus avoiding the obligations under the 1968 Nuclear Non-Proliferation Treaty. In this context, the meaning of “peaceful purposes” in the Moon Agreement will continue to be controversial.

Some commentators argue that the provision in the Moon Agreement allowing for the use of military personnel, equipment and facilities for peaceful exploration and scientific research undermines the entire principle of prohibiting a military presence in outer space.³³ This is because it would be difficult to remove the military character of the personnel or equipment or distinguish between peaceful and military research in outer space. In the future, as the division between military and civilian uses of aerospace technology becomes increasingly blurred, this may become a heated issue.³⁴

Another controversy that may arise under the Moon Agreement is on the use of force.³⁵ Article 2 provides for the application of the United Nations Charter to the Moon. Article 51 of the Charter allows states to use force in self-defence. Furthermore, Article 42 allows for the Security Council to authorise the use of force to remove a breach of the peace, a threat of the peace or an act of aggression, despite the prohibition on the use of force found in Article 2 of the Charter. In this context it may be argued that notwithstanding Article IV of the Outer Space Treaty and Article 3 of the Moon Agreement, Chapter VII of the Charter may allow the use of force in outer space. This may be so notwithstanding that this would be contrary to the aims and objectives of the space treaties and the Charter.

STATE RESPONSIBILITY

Article 14 of the Moon Agreement, which is similar to Article VI of the Outer Space Treaty, provides for states to bear international responsibility

³² Article 1 of the 1959 Antarctic Treaty (1959) 402 United Nations Treaty Series 71.

³³ See Topping, “The legality of President Reagan’s proposed space-based ballistic missile defence system” (1984) 14 *Georgia Journal of International and Comparative Law* 329.

³⁴ Generally, see Doyle SE (ed), *Civil Space Systems: Implications for International Security* (1993, United Nations Institute for Disarmament Research, Vienna).

³⁵ See Matte, “Legal principles relating to the moon” in Jasentuliyana N and anor (eds), *Manual on Space Law* (1979 Oceana Publications, New York) 259; Courteix, “L’Accord régissant les activités des Etats sur la lune et les autres corps célestes” [1979] *Annuaire Français de Droit International* 211.

for “national activities” on the Moon, even if the activities are undertaken by “non-governmental entities”. This raises three issues.

The first issue relates to the uncertain nature of the content of state responsibility. As Professor Bin Cheng articulated in his discussion of Article VI of the Outer Space Treaty, there are many specific obligations imposed on states.³⁶ They are required to:

1. ensure that their space activities as well as non-governmental national space activities comply with the obligations under the relevant space treaties; and
2. provide authorisation and continuing supervision to non-governmental space activities and to assume direct state responsibility for them.³⁷

With respect to the assumption of direct state responsibility, it would mean *prima facie* that everything that is done by a non-governmental entity is deemed to be an act imputable to the state as if it were its own act, for which it bears direct responsibility. Consequently, a state would be liable for any breach of international law to provide compensation amounting to *restitutio in integrum*.³⁸ In this respect, the Liability Convention provides that the exhaustion of local remedies rule will not apply.³⁹

What is the extent of this state assumption of direct responsibility? Article III of the Outer Space Treaty requires outer space activities to comply with international law. Compliance with treaty obligations is a fundamental

³⁶ Cheng, “Article VI of the 1967 Space Treaty revisited: ‘international responsibility’, ‘national activities’ and ‘the appropriate nation’ ” (1998) 26 Journal of Space Law 7, 12-19.

³⁷ See discussion in Wirin, “Practical implications of launching state – appropriate state definitions” (1994) Proceedings of the 37th Colloquium on the Law of Outer Space 109, 110; Cheng B, *Studies in International Space Law* (1997, Clarendon Press, Oxford) 237.

³⁸ See Cheng, “Article VI of the 1967 Space Treaty revisited: ‘international responsibility’, ‘national activities’ and ‘the appropriate nation’ ” (1998) 26 Journal of Space Law 7, 12-19; von der Dunk, “Liability versus responsibility in space law: misconception or misconstruction?” (1991) Proceedings of the 34th Colloquium on the Law of Outer Space 363.

³⁹ See Article XI(1) of the Liability Convention. Generally, before a state can take up a claim on behalf of its aggrieved national against another state, namely, the host state, all effective local remedies must have been exhausted in the host state first of all: Salem case (Egypt v United States) (1932) 2 Reports of the International Arbitral Tribunal 1161.

principle of international law. States are therefore responsible for “assuring” compliance by non-governmental entities. In Professor Bin Cheng’s opinion, the use of the word “assuring” rather than merely “ensuring” would suggest that the states are to act as guarantors for such compliance.⁴⁰

Article VI of the Outer Space Treaty and Article 14 of the Moon Agreement may be interpreted to mean that states are not responsible to one another for breaches of municipal law by their non-governmental entities, an interpretation that is by no means certain.⁴¹ Even if such interpretation is correct, states would still bear indirect responsibility for acts of private entities under their effective jurisdiction. Consequently, a duty to protect foreign nationals and their property in accordance with the established principles of law relating to treatment of aliens and trans-boundary harm should continue to apply to non-governmental national outer space activities.⁴²

The second issue relates to the meaning of “national activities” which has not been adequately defined. Just as the word “State” in the phrase “States operating remote sensing satellites” in the Remote Sensing Principles cannot be interpreted to mean the states to the exclusion of non-governmental entities, “national activities” cannot be interpreted to mean “State activities”.⁴³ However, the term must indicate some connection to the nation, otherwise the word “national” would not be included in the terms.

There are several approaches to this issue. The first approach suggests that national activities are those for which the state is the state of registry of the space object. Where there is more than one state involved, the 1975 Registration Convention provides for the states involved to determine one

⁴⁰ Cheng, “Article VI of the 1967 Space Treaty revisited: ‘international responsibility’, ‘national activities’ and ‘the appropriate nation’ ” (1998) 26 *Journal of Space Law* 7, 16.

⁴¹ *Ibid* at 18.

⁴² *Trial Smelter Arbitration* (1941) 3 *Reports of the International Arbitral Tribunal* 1911, 1963; *Corfu Channel Case (Merits)* [1949] *International Court of Justice Reports* 4, 22; Cheng, “The contribution of international courts and tribunals to the protection of human rights under international customary law” in Eide A and anor (eds), *International Protection of Human Rights* (1967, Interscience, New York) 167-175.

⁴³ See Principle XIV of the Principles Relating to the Remote Sensing of the Earth from Outer Space, United Nations Doc A/41/20.

state of registry.⁴⁴ If international responsibility for national activities depends on registration alone, then some states will not be internationally responsible for outer space activities conducted by non-government entities. Furthermore, this would “easily enable the states concerned to create a ‘registry of convenience’ in some half-bankrupt state and evade their responsibility”.⁴⁵ Therefore, registration cannot be the only criterion for defining national activities.

The second approach suggests that Article IX of the Outer Space Treaty infers that the nationality of the persons involved would determine the meaning of “national activities”. This is unlikely to be the case since nationals operating from a foreign state would cause their state of nationality to assume responsibility over activities beyond its effective jurisdiction.⁴⁶ Further, this would remove the responsibility of states with respect to activities by foreign nationals in their territory or on their ships or aircraft of their nationality.

The third approach suggests, probably correctly, that the reference to “jurisdiction” in Article 14 of the Moon Agreement would indicate that states should bear international responsibility for any activities within their legal power to control. In this view, any activity carried on within a nation’s territorial, quasi-territorial and personal jurisdiction would qualify as the “national activities” of the nation.⁴⁷ Therefore, under Article 14 of the Moon Agreement, outer space activities conducted from a nation’s territory, spacecraft or lunar installation or by nationals would be classified as “national activities”.

⁴⁴ Article II(2) of the Registration Convention.

⁴⁵ Cheng, “Article VI of the 1967 Space Treaty revisited: ‘international responsibility’, ‘national activities’ and ‘the appropriate nation’ ” (1998) 26 *Journal of Space Law* 7, 22; Cheng B, *Studies in International Space Law* (1997, Clarendon Press, Oxford) 626-627.

⁴⁶ Generally there are three types of state jurisdiction: (1) territorial jurisdiction, which is the jurisdiction a state normally has over its territory; (2) quasi-territorial jurisdiction, which is the jurisdiction a state has over its ships, aircraft, space objects and other means of transport that is owned or registered with the nation; and (3) personal jurisdiction, which is the jurisdiction a state has over its own nationals. Each type of jurisdiction is further divided into jurisdiction, the power of states to enact laws applying to subject matters within their jurisdiction, and jurisdiction, the power of states to enforce such laws. A nation’s jurisdiction is always universal, with the result that an object of international law may be concurrently subject to the jurisdiction of many states: Cheng, “The extra-terrestrial application of international law” (1965) 18 *Current Legal Problems* 132.

⁴⁷ Cheng, “Article VI of the 1967 Space Treaty revisited: ‘international responsibility’, ‘national activities’ and ‘the appropriate nation’ ” (1998) 26 *Journal of Space Law* 7, 24.

The third issue is whether liability in the context of this discussion is equivalent to liability under international law, generally speaking. This is particularly relevant in situations where it may be inappropriate for the Liability Convention to apply. For example, where the ownership of the space object or the lunar installation has been transferred to a non-launching nation, the Liability Convention would only impose liability on the launching state even though it may have no connection with the operation of the spacecraft.

In the example used by Dr Ernst Fasan above where a small asteroid is hollowed out and covered with artificial structures, any damage caused by it would, strictly speaking, be regarded as an impact with a natural asteroid. In these circumstances, it would be reasonable to overlook the Liability Convention and impose liability on the states responsible for such activities, as is the case with respect to activities on Earth.

Contrary to popular perception, the Moon Agreement merely reaffirms existing principles of state responsibility already found in the Outer Space Treaty and customary international law. The fact that Article 14 specifically ascribes state responsibility to activities within its jurisdiction has given the impression that new obligations have been created. This uncertainty exacerbates further the controversies surrounding the Moon Agreement.

COMMON HERITAGE OF MANKIND

There is no other aspect of the Moon Agreement that is more controversial than the provision declaring the Moon and other celestial bodies to be the "common heritage of mankind". In essence, the Moon Agreement vests the Moon and other celestial bodies with a form of common ownership that requires the mandatory sharing of benefits derived from any exploitation of celestial resources. Such a provision, alongside the express and implied obligations imposed on states, continues to serve as a major inhibiting factor in relation to the general acceptance of the Moon Agreement.

The idea that outer space cannot be subject to the sovereign ownership of any state is not a new one. Article II of the Outer Space Treaty prohibits "national appropriation", even "by means of use or occupation". This in effect outlaws *imperium*, the form of public ownership that establishes sovereign rights in relation to certain areas by virtue of the fact that

celestial bodies are *res communis*.⁴⁸ However, *dominium* and ownership by a state of materials exploited would continue to be possible for private entities. This is particularly relevant in the creation and acquisition of intellectual property rights, as they may be regarded either as the common heritage of mankind or as a benefit derived from the celestial bodies, and therefore subject to sharing among states.

In the traditional view of most scholars, the “common heritage of mankind” principle in relation to outer space does not apply the *res communis* principle. On the contrary, it transforms into something that creates specific obligations on states utilising this area. Under the doctrine, areas designated as the common heritage of mankind, or *terra communis humanitatis*, would be owned by no one and yet theoretically managed by everyone. Sovereignty does not exist here and legally the international community as a whole would manage the area.⁴⁹ States would have no role in the management of these areas except as representatives of all mankind.

The common heritage of mankind doctrine also requires any use to be limited to peaceful purposes.⁵⁰ For the purpose of scientific research, however, free access to any *res communis humanitatis* would be permissible provided the benefits of such research are available to anyone expressing a genuine interest in them.⁵¹ In other words, even if the research were financed by a state or a group of states, the fruits of the research would be available freely to the international community, as has been the case in Antarctica.⁵²

It is crucial to recognise that the doctrine requires any benefits derived from the exploitation of natural resources to be shared internationally. As a result, exploitation by commercial entities would be deemed inappropriate unless their efforts contributed to the common benefit of all mankind. The

⁴⁸ See Brownlie I, *Principles of Public International Law* (1998, 5th edition, Oxford University Press, Oxford) 105.

⁴⁹ Joyner, “Legal implications of the concept of the common heritage of mankind” (1986) 35 *International and Comparative Law Quarterly* 190, 191.

⁵⁰ See Zadalis, “‘Peaceful purposes’ and other relevant provisions of the revised composite negotiating text: a comparative analysis of the existing and proposed military regime for the high seas” (1979) 7 *Syracuse Journal of International Law and Commerce* 1.

⁵¹ Article 5 of the Moon Agreement.

⁵² Article 3 of the Moon Agreement.

extent of this sharing of benefits was never specifically defined and as such uncertainty remains today on the extent of this obligation.

As the New International Economic Order (“NIEO”) concept increased in popularity among developing states, a more radical view of the common heritage of mankind doctrine emerged at the end of the 1970s.⁵³ Instead of the absence of sovereign ownership in outer space, this new doctrine provides for full legal ownership to be vested in the international community as a whole.⁵⁴ States would share any profits derived from mineral exploitation in outer space, with preference given to developing states.⁵⁵ An international authority or institution would also administer the area and implement the obligations under the new doctrine.⁵⁶

Article 11 of the Moon Agreement appears to reflect this approach by declaring that the Moon and its natural resources are the common heritage of mankind and providing for the establishment of an international régime to govern the exploitation of such resources. This régime will provide for “an equitable sharing by all state Parties in the benefits derived from those resources, whereby the interests and needs of the developing states”, as well as those of the exploiting states, shall be given special consideration.⁵⁷ Under the 1982 Convention of the Law of the Sea, which declared the deep seabed to be the common heritage of mankind, an International Seabed Authority was created and charged with the responsibility to license and

⁵³ See generally Sauvart KP and anor (eds), *Changing Priorities on the International Agenda: The New International Economic Order* (1981, Pergamon, Oxford); Singh JS, *A New International Economic Order: Toward a Fair Redistribution of the World’s Resources* (1977, Praeger, New York); and Hossain K (ed), *Legal Aspects of the New International Economic Order* (1980, Nichols, London).

⁵⁴ See Pinto, “Toward a regime governing international public property” in Dolman AS (ed), *Global Planning and Resource Management: Toward International Decision-Making in a Divided World* (1980, Pergamon, New York) 202-224.

⁵⁵ See Boczek, “Ideology and the law of the sea: the challenge of the new international economic order” (1984) 7 *Boston College International and Comparative Law Review* 1.

⁵⁶ Webber, “Extraterrestrial law on the final frontier: a regime to govern the development of celestial body resources” (1983) 71 *Georgetown Law Journal* 1427, 1448.

⁵⁷ See Christol, “The common heritage of mankind provision in the 1979 Agreement Governing the Activities of states on the Moon and other Celestial Bodies” (1980) 14 *International Lawyer* 429; Ferrer, “Legal implications of the principle according to which exploration and use of outer space shall be carried out for the benefit and interest of all states, taking into particular account the needs of developing states” (1989) *Proceedings of the 32nd Colloquium on the Law of Outer Space* 5.

regulate mineral exploration and exploitation in the seabed.⁵⁸ At the same time the Convention created an inter-governmental mining company to participate in the exploration and exploitation of resources in competition with licensed private entities.⁵⁹

Under the original seabed régime proposal, a private enterprise entity must be “sponsored” by a state Party to the Convention and apply to the International Seabed Authority for a licence.⁶⁰ The company is required to pay a specific portion of its resources or profits to the Authority, and it must transfer the technology utilised in its efforts to the inter-governmental mining company on a “fair and reasonable commercial basis”.⁶¹ Limitations have been placed on the number of licences that may be granted to a state and the amount of resources extracted from a specified location. The Authority has to recover its own costs before distributing the profits to developing states.⁶²

The United States and most developing states quickly objected to this application of the principle. In their view, the developing world should not gain a free benefit from the efforts and investment of the developed states in mining ventures in the deep seabed. The United States argued that while the principle did not “embody any substantive rules or a predetermined legal régime to regulate activities”, they nonetheless declined to take the risk of exposure to obligations that were adverse to their interests.⁶³ The developed states⁶⁴ signed instead a Provisional Understanding Regarding Deep Seabed Matters between themselves in 1982.⁶⁵

The impasse was not resolved until the Convention was about to come into force in 1990. As a result of the desire to bring the international community under one régime, the Convention was revised. It reduced the fees of licences and abolished mandatory technology transfers and production ceilings. The distribution of revenue was to be determined at a later time,

⁵⁸ Articles 151-161 of the 1982 Law of the Sea Convention.

⁵⁹ *Ibid* Article 170.

⁶⁰ *Ibid* Articles 156-169.

⁶¹ *Ibid* Article 170.

⁶² *Ibid* Article 140.

⁶³ Raclin, “From ice to ether: the adoption of a regime to govern resource exploitation in outer space” (1986) 7 *Journal of International Law and Business* 727, 738-739.

⁶⁴ France, West Germany, United Kingdom and United States.

⁶⁵ (1982) 21 *International Legal Materials* 950.

and the United States was given a bigger role in the control of the Authority.⁶⁶ The United States and other developed states subsequently became signatories to the Convention.

There has been no revision of the Moon Agreement and many have argued that there are significant differences between this agreement and the 1982 Convention on the Law of the Sea, thus requiring a different approach to the common heritage of mankind provisions. In the first place, the principle applies only to the resources of the celestial bodies before their removal, which means that full ownership may be exercised over them after mining notwithstanding the provisions of the Moon Agreement.⁶⁷ Secondly, the Moon Agreement uses a different language. It provides for the sharing of “benefits” (not “resources”, “revenue” or “profits”) on an “equitable” (not “equal”) basis. The Agreement provides also for the exploiting state to determine how and in what manner it will share these “benefits”.⁶⁸ Thirdly, Article 11(2) of the Moon Agreement prohibits any claim to sovereignty by any means, which would counter the “common property” approach advocated by the NIEO and its version of the doctrine of the common heritage of mankind.⁶⁹

These arguments will not be effective in resolving the impasse as to the meaning of the common heritage of mankind concept and it is unlikely that either the developed or developing states would accept an interpretation that is adverse to their own interests. If the views of the potential entrepreneurs are any guide, and even if a Moon Agreement regime is created that parallels the International Seabed Authority, the sharing of benefits mandated by the developing states is likely to inhibit any large scale commercial investment in the development of celestial resources.⁷⁰

⁶⁶ See Hoffstadt, “Moving the heavens: lunar mining and the ‘Common Heritage of Mankind’ in the Moon Treaty” (1994) 42 *University of California Los Angeles Law Review* 575, 598-605.

⁶⁷ United States Senate Committee on Commerce, Science and Transportation, 96th Congress, 2nd Session, 1980 Report on Agreement Governing the Activities of States on the Moon and Other Celestial Bodies 30.

⁶⁸ *Ibid* at 18; White, “The common heritage of mankind: an assessment” (1982) 14 *Case Western Reserve Journal of International Law* 509, 530.

⁶⁹ See Rana, “The ‘common heritage of mankind’ and the final frontier: a revaluation of values constituting the international legal regime for outer space activities” (1994) 26 *Rutgers Law Journal* 225, 248-249.

⁷⁰ Benson, “Space resources: first come first served”, paper presented at the 41st Colloquium on the Law of Outer Space, September-October 1998, Melbourne (not yet published).

PROPERTY RIGHTS

With respect to real property rights, the Moon Agreement explicitly prohibits their creation on celestial bodies. This coincides with the legal characterisation of outer space as being the “common heritage of mankind” which means that it is incapable of being subjected to any form of private ownership.

There are many policy reasons for this prohibition. First, once a national government begins to legislate to grant property rights on celestial bodies, other governments may follow suit and grant similar rights to the same asteroid to different companies. While it is unlikely that a skirmish in outer space would occur between different claimants, if it occurred it would cause a dispute on Earth where no legal means to resolve the matter exists.

Secondly, the creation of private property rights may exclude future exploration and exploitation ventures on the celestial bodies in question. Where a state like Tonga, which has no outer space capability, has managed to profit substantially by exploiting the flaws of the “paper satellite” problem, many other states may similarly establish ownership claims over valuable resources in outer space, hence preventing future exploitation.

Thirdly, the creation of private property rights would make the uniform preservation and conservation of the celestial environment impossible. Being the “common heritage of mankind”, the international community has an obligation to ensure that the environments of the celestial bodies are protected – an aim that would be endangered by the creation of national property rights.

Notwithstanding the express prohibition of private ownership, the Moon Agreement clearly intends for limited property rights to be available for future resource development on celestial bodies. Article 11(3) states that “the foregoing provisions are without prejudice to the international régime referred to in Paragraph 5 of this Article.” In other words, Paragraph 3 only serves to prohibit the creation of full property rights amounting to ownership by national governments and the granting of property rights by possession and occupation. It does not prevent the creation of property rights, even full ownership, by an international régime irrespective of

physical occupation.⁷¹ It is clearly anticipated that the international régime, when created, would provide for leases or licences for the purposes of mining and other forms of exploitation similar to the way in which domestic mining leases are granted in Australia.

Another aspect of property rights in outer space is the provision of intellectual property rights. The Moon Agreement probably applies the same principles to intellectual property as it does to real property, considering no such distinction is made in the treaties. Consequently, it should be possible for the international régime to provide for some form of intellectual property registration system in outer space.

The Moon Agreement recognises the right of states to collect and remove samples from the surface and sub-surface of the Moon.⁷² Although Article 11(3) prohibits the creation of property rights, this prohibition should not interfere with legitimate projects to extract mineral samples, even if the projects have commercial aspects.

CREATING AN INTERNATIONAL RÉGIME

Since the Moon Agreement was finalised, there have been many proposals relating to legal régimes for the exploitation of celestial body resources, ranging from a basic implementation of the terms of the Moon Agreement to a complete overhaul of the existing space law framework.⁷³ Before considering the proposals it may be useful to study some terrestrial and orbital models of international resource exploitation, such as the model under the 1959 Antarctic Treaty and the INTELSAT system.

The Antarctic System

In contrast to the 1982 Convention on the Law of the Sea and the Moon Agreement, the 1959 Antarctic Treaty provides that a state becomes a

⁷¹ This therefore contradicts the view that the Moon Agreement prohibits any form of private ownership of property in outer space.

⁷² Article 6 of the Moon Agreement.

⁷³ Christol, "An international regime, including appropriate procedures, for the Moon: Article 11, Paragraph 5 of the 1979 Moon Treaty" (1980) Proceedings of the 23rd Colloquium on the Law of Outer Space 139; Matte, "The common heritage of mankind principle in outer space: towards a new international order for survival" (1987) 12 *Annals of Air and Space Law* 313; Barritt, "A 'reasonable' approach to resource development in outer space" (1990) 12 *Loyola of Los Angeles International and Comparative Law Journal* 615.

“Consultative Party” by undertaking “substantial scientific research activity” in Antarctica.⁷⁴ This is well beyond the budgets of most developing states.⁷⁵ Consequently, the Antarctic Treaty system is dominated by industrialised states. Under any proposed régime for the development of petroleum resources in Antarctica, there has been no question of sharing resources, profits or technology because the main concern was the protection of the environment.

Under the 1988 Wellington Convention on the Regulation of Antarctic Mineral Resource Activities, the Antarctic Mineral Resources Commission was proposed to oversee development in certain zones of the Antarctic continent.⁷⁶ Private ventures would be required to pay fees and taxes on the minerals they extract but there would be no sharing of benefits, nor would there be any mandatory technology transfer. It should be noted, however, that the Wellington Convention never came into force and has been shelved for fifty years.⁷⁷

There are several reasons why the Antarctic régime under the 1988 Wellington Convention would not be appropriate to outer space. First, the sharing of benefits is required on an equitable basis under the Moon Agreement. Secondly, the Antarctic Treaty system is dominated by developed states, whereas any régime created for outer space would be likely to involve substantial participation by developing states. Thirdly, the states belonging to the Antarctic Treaty system operate by consensus, but this would be impractical in relation to decisions on outer space owing to the large number of states that would be involved in the process.⁷⁸

⁷⁴ The Antarctic Treaty (1959) 402 United Nations Treaty Series 71.

⁷⁵ Article IX of the Antarctic Treaty. Germany became a Consultative Party only after establishing a research station program at a cost of over US\$100 million.

⁷⁶ Article 21 of the 1988 Convention on the Regulation of Antarctic Mineral Resource Activities, (1988) 27 *International Legal Materials* 868. The Wellington Convention is not yet in force. See also Zang, “Frozen in time: the Antarctic Mineral Resource Convention” (1991) 76 *Cornell Law Review* 722, 733-734.

⁷⁷ Weiss, “International environmental law: contemporary issues and the emergence of a new world order” (1993) 81 *Georgetown Law Journal* 675, 704.

⁷⁸ Raclin, “From ice to ether: the adoption of a regime to govern resource exploitation in outer space” (1986) 7 *Journal of International Law and Business* 727, 753. See also Staub, “The Antarctic Treaty as precedent to the Outer Space Treaty” (1974) *Proceedings of the 17th Colloquium on the Law of Outer Space* 282; Minola, “The Moon Treaty and the law of the sea” (1981) 18 *San Diego Law Review* 455.

The International Telecommunications Satellite Organisation

The International Telecommunications Satellite Organisation, more commonly known as INTELSAT, has been proposed as a model for the celestial body resource régime.⁷⁹ While the model may be attractive, there are significant flaws in implementing a similar system for the regulation of celestial body resources. For example, an organisation like the INTELSAT would engage in resource exploitation itself, creating a monopoly and frustrating other governmental and private activities, thus violating the principle of free use enshrined in the treaties.⁸⁰

More importantly, the political climate in which the INTELSAT was created has changed significantly. The INTELSAT was created at a time where there were few developing states and voting weight depended on participation and investment in the system. Given that developing states are unlikely to receive any benefit from a resource exploitation régime without being able to participate in the decision-making process, they are unlikely to find the INTELSAT model acceptable to them.

Creating a Unique Régime

It is clear, therefore, that any régime to be created in outer space would have to be a unique one, with some similarity to the International Seabed Authority. As Dr Allen D Webber has suggested, an autonomous panel of individuals who are not dominated or controlled by any nationalistic entities should govern the régime. He proposed that a small working group of delegations within COPUOS could formulate a list of space law scholars with their qualifications to be considered. These nominees would not be approved without the consensus of COPUOS members. He stated:⁸¹

The COPUOS working group should nominate individuals with the legal and technical expertise necessary to guide lunar resource development and a global vision that transcends national boundaries...

⁷⁹ Christol CQ, *The Modern International Law of Outer Space* (1982, Pergamon, New York) 390-396.

⁸⁰ Webber, "Extraterrestrial law on the final frontier: a regime to govern the development of celestial body resources" (1983) 71 *Georgetown Law Journal* 1427, 1448.

⁸¹ *Ibid.*

Further, persons who represent their governments in any official capacity should be excluded from selection.⁸² This would enable the international institution to exercise its functions and powers with a relative degree of autonomy and independence and without a nexus to states.

The international régime would essentially constitute a licensing system that takes into account commercial viability, future access and environmental protection. This licence, to be granted for a sufficient period of time, should not be regarded as a conferral of permanent property rights over the area but the licensee should control exclusively the resources.⁸³ Under such a régime, the licence should be sufficient to provide adequate protection for investors seeking security in their investments.

Some scholars have suggested the introduction of a taxation system that funds the international authority and a moderate sharing of profits to developing states even.⁸⁴ This is unlikely to be acceptable to developed states, such as the United States, as this would provide an uncomfortable precedent for international organisations being given the power of taxation in relation to the international activities of private individuals.

Realistically, notwithstanding the views of the entrepreneurs, developing states are likely to insist on a moderate sharing of profits as a minimum requirement.⁸⁵ Mr Brian M Hoffstadt proposes a Lunar Commission that sets a maximum return on investment for the privately owned company in a way that is similar to the operation of the Public Utilities Commissions in the United States.⁸⁶ The company would keep any profits under this maximum and any surplus is either split between the company and the

⁸² Ibid at 1451-1452.

⁸³ Ibid at 1453-1454; Pontious, "A proposed régime and its ramifications on the commercialisation of outer space" (1991) 7 *Computer and High Technology Law Journal* 157.

⁸⁴ Webber, "Extraterrestrial law on the final frontier: a regime to govern the development of celestial body resources" (1983) 71 *Georgetown Law Journal* 1427, 1456.

⁸⁵ See Wihlborg and anor, "Outer space resources in efficient and equitable use: new frontiers for old principles" (1981) 24 *Journal of Law and Economics* 23; Doyle, "Using extraterrestrial resources under the Moon Agreement of 1979" (1998) 26 *Journal of Space Law* 111.

⁸⁶ Hoffstadt, "Moving the heavens: lunar mining and the 'common heritage of mankind' in the Moon Treaty" (1994) 42 *University of California Los Angeles Law Review* 575, 614-615.

Commission or given totally to the Commission.⁸⁷ The Commission would adjust the maximum periodically, taking into account the commercial risks involved and the level required to attract investors to the commercial space venture. The portion of the surplus collected by the Commission could be used to defray its own costs or channelled into an international organisation such as the World Bank and distributed to developing states.⁸⁸ Such a system should be satisfactory to the majority of developing states.

The absence of sovereignty and property rights in outer space exposes commercial space ventures to risk. Proposals to amend the space treaties to provide for private land ownership or mining leases are inconsistent with the lofty principles of space law and would not prevent the “paper satellite” problem that has plagued the International Telecommunications Union in its allocation of the geostationary orbit.⁸⁹

The suggested Lunar Commission and its granting of licences should provide adequate security provided that the régime is recognised and respected by the international community. In addition, a lunar patent system guaranteed for a certain number of years would protect the investment returns on any developed lunar technology, after which it would become freely available to the world.⁹⁰ Together, such a system should be adequate to provide investors with sufficient confidence that the products and technologies produced are secure from expropriation, at least for a substantial period of time.

⁸⁷ Naturally the former option would be more appropriate as it provides an incentive for the company to obtain profits over and above the maximum return on investment set by the Commission.

⁸⁸ Kamenetskaya, “On the establishing of world space organisation: some considerations and remarks” (1989) *Proceedings of the 32nd Colloquium on the Law of Outer Space* 358, 359.

⁸⁹ Amendment of the treaties would require a wholesale rethinking of the space law framework and is thus impractical: Twibell, “Space law: legal restraints on commercialisation and development of outer space” (1997) *65 UMKC Law Review* 589, 635. A proposed system of leases regulated by an international body would have similar flaws: Keefe, “Making the final frontier feasible: a critical look at the current body of outer space law” (1995) *11 Computer and High Technology Law Journal* 345, 366-367.

⁹⁰ Hoffstadt, “Moving the heavens: lunar mining and the ‘common heritage of mankind’ in the Moon Treaty” (1994) *42 University of California Los Angeles Law Review* 575, 616-617.

The Lunar Commission should be established before states or private enterprises begin to acquire economic interests on the Moon by commencing the development of lunar resources. It would be difficult to assert external control and jurisdiction once national entities establish a commercial presence on the Moon.⁹¹ As Dr Allen D Webber points out:⁹²

Celestial bodies offer an unique opportunity to implement a global approach to problems in an environment untainted by nationalistic interests.

The fact that there are no national territorial claims, nor any proclaimed development or economic rights, on the Moon or any other celestial body would assist in enabling the international community to agree to a uniform régime.⁹³

As mentioned above, with the revision of the Convention on the Law of the Sea and with the developing states expressing an unprecedented willingness to accommodate commercial priorities on international issues, this is the best time to negotiate and implement a new régime. However, without agreement on the control that the developed states, especially the United States, are going to have on the future international régime and a clarification on the content of the common heritage of mankind doctrine, it is unlikely that this dispute will be resolved in the near future.

In view of the continuing debate over the nature, composition, powers and functions that such a Moon Agreement régime should have and it is not realistic to expect that an acceptable régime will be agreed upon and implemented in the near future.⁹⁴ This leaves the states that have ratified the Moon Agreement, especially those that wish to encourage commercial

⁹¹ Taubenfeld, "A régime for outer space" (1961) 56 North Western University Law Review 129, 166; Christol CQ, *The Modern International Law of Outer Space* (1982, Pergamon, New York) 1.

⁹² Webber, "Extraterrestrial law on the final frontier: a regime to govern the development of celestial body resources" (1983) 71 Georgetown Law Journal 1427, 1451.

⁹³ Some enterprises may well be already looking for flag-of-convenience states: see Christol, "Current development: the Moon Agreement enters into force" (1985) 79 American Journal of International Law 163.

⁹⁴ See O'Donnell and anor, "Legal strategies for a lunar economic development authority" (1996) 21 Annals of Air and Space Law 121; Christol, "The natural resources of the moon: the management issue", paper presented at the 41st Colloquium on the Law of Outer Space, September-October 1998, Melbourne (forthcoming).

space ventures, such as Australia, in something of a dilemma. Will a state that has already ratified the Moon Agreement be regarded as an unsuitable domicile for a commercial venture intending to pursue a project involving the exploitation of outer space resources? If so, would it be in the interests of such a state to withdraw its ratification?

On balance, the Moon Agreement serves a useful purpose in the enunciation of principles to guide the future exploitation of celestial resources and should not be abandoned. While the full implications of the proposed régime for the sharing of the benefits of exploitation have deterred some states from committing to it, the proposed regime provides a framework that in principle is not unreasonable in terms of the established norms of international space law. The alternative system of national recognition of celestial property rights is fraught with risks for international peace and security.

IMPLICATIONS AND CONCLUSIONS

Due to the limited acceptance of the Moon Agreement, there are potentially two international legal régimes governing the Moon and celestial bodies. One is created under the Moon Agreement but is limited by the lack of momentum to establish the international régime provided for under Article 11. The other is created under the Outer Space Treaty and the subsequent crystallisation of most of its principles into customary international law. This allows states to exercise jurisdiction over the behaviour of nationals and non-nationals on the Moon and other celestial bodies.

Consequently, states that are not party to the Moon Agreement may impose conditions on their nationals as to their conduct in outer space as they see fit. This is parallel to the situation relating to the deep seabed where developed and developing states have created two separate régimes. However, this caused the participating states to attempt to protect national claims against the deep seabed provisions as well as to seek recognition of existing mining sites so as to avoid conflicts.

With respect to the implications of this dual system on commercial ventures in outer space, Professor Carl Q Christol wrote:

Whether the coexistence of the two treaty-based régimes for Moon and celestial body resources is at the present time adverse to general

community interests is doubtful. Exploitative activity has not been particularly helped or hindered by the dual system. Until there is proof that the resources have any Earth-based value, it is not likely that meaningful harm or serious inequities will result. On the other hand, it can be argued that the existence of a functioning international legal régime dealing with the exploitation and sharing of Moon resources would be beneficial or encouraging.⁹⁵

Regardless of when and what celestial resources would become available for profitable ventures, an international régime that clarifies the principles, standards and rules applicable to outer space is still a desirable goal. While commercial ventures would face considerable financial risk and may be deterred by the need to share profits internationally, the legal and regulatory uncertainty surrounding the rights of such ventures under international law may be an even greater deterrent. Such a régime is unlikely to come about soon, not because of a lack of will to compromise, as happened with the deep seabed, but because of a lack of urgency. In the meantime, private ventures that wish to proceed without the umbrella of the Moon Agreement will still be the subject of the authorisation and continuing supervision of the states concerned.

In any event, the Moon Agreement should not be simply discarded. There are strong arguments in favour of states sharing resources that are obtained from outer space pursuant to a suitable formula that they would agree upon. This is strengthened by the fact that the developing world has attached an important and durable political significance to this international objective. Meanwhile, nothing in the Moon Agreement has prevented a state from authorising its nationals to participate in the "space rush" to exploit mineral resources in outer space. In the future, however, it is hoped that the impetus will develop for states to agree on the creation of an international régime that would allow humankind to explore and exploit the riches of the final frontier peacefully.

⁹⁵ Christol, "The Moon Treaty and the allocation of resources" (1997) 22 *Annals of Air and Space Law* 31, 45.