EXTRATERRESTRIAL PROPERTY RIGHTS:
A COSMIC CATASTROPHE LURKING IN THE SIDELINES

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This thesis is presented for the Honours degree of Bachelors of Laws at Murdoch University.

2015
DECLARATION OF ORIGINALITY

I, Perveen Kaur, hereby declare that this thesis is my own work and effort and that it has not been submitted anywhere for any award. Where other sources of information have been used, they have been acknowledged.

Perveen Kaur
ACKNOWLEDGEMENTS

I would like to express my deepest appreciation to my supervisor, Dr Jürgen Bröhmer for all his intellect, enthusiasm and guidance throughout the past year. You gave me the courage to question the norms and for this, I shall remain forever indebted.

Dad, this thesis is for you.

You will always remain my greatest inspiration. Seeing your emaciated figure, slowly wither away, by my side, has been extremely excruciating. We miss you dearly. Thank you for fighting so hard for us.

Mom, thank you for being a superwoman and holding down the fort. And a big thank you to my sister, Charanpreet. You have been my pillar of strength and motivation to never give up.
ABSTRACT

In 1966, the United Nations Legal Subcommittee drafted the widely accepted Outer Space Treaty to regulate the use and exploration of Outer Space. Following the Cold War and successful launch of the Russian Spacecraft Sputnik I in 1957, this treaty formed the preliminary framework for all the subsequent Outer Space Treaties, including the failed Moon Agreement, which attempted to detail the use of the Outer Space Resources.

Although the Outer Space Treaty expressly precludes the ‘sovereign appropriation’ of the Moon and Other Celestial bodies, it remains unclear till today whether these exclusions extend to private ‘non-governmental’ entities. More importantly, the Outer Space Treaty fails to establish any positive property rights regime on the use of extra-celestial land or minerals in Outer Space.

As the existing property rights regime on the Moon and other celestial bodies remains clouded by great uncertainty and ambiguity, there is an urgent need for reform. This thesis asks the fundamental question: Is the existing property rights regime effective in protecting the property rights asserted by private non-governmental entities in Outer Space? Rejecting the Common Heritage of Mankind concept adopted in the use and exploitation of the global commons, Antarctica and the Deep Seas, this paper critically re-evaluates the Grotius’ seminal work *Mare Liberum* (The Free Sea). Adopting a Lockean liberal stance on the common ownership and use of property, this paper will call for the implementation of a less restrictive private property rights regime applying a ‘new’ public trust doctrine.
# Glossary of Abbreviations

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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>ATS</td>
<td>Antarctic Treaty System</td>
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<td>CHM</td>
<td>Common Heritage of Mankind</td>
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<td>COPUOS</td>
<td>Committee on the Peaceful Uses of Outer Space</td>
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<td>Deepsea Venture</td>
<td>Deepsea Venture Inc</td>
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<td>EEZ</td>
<td>Exclusive Economic Zone</td>
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<td>ICJ</td>
<td>International Court of Justice</td>
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<td>IIL</td>
<td>Institute of International Law</td>
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<td>IISL</td>
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<td>ILA</td>
<td>International Law Association</td>
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<td>IPU</td>
<td>International Property Union</td>
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<td>ISA</td>
<td>International Seabed Authority</td>
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<td>ITU</td>
<td>International Telecommunication Union</td>
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<td>NASA</td>
<td>National Aeronautics and Space Administration</td>
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<td>New York Bar Association</td>
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<td>OSA</td>
<td>Outer Space Authority</td>
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<td>OST</td>
<td>Outer Space Treaty</td>
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EXTRA-TERRESTRIAL PROPERTY RIGHTS:

A COSMIC CATASTROPHE LURKING IN THE SIDELINES

PERVEEN KAUR

I INTRODUCTION

I’m an optimist.

We will reach out to the stars.

Stephen Hawking

A Background

For the longest time, the voyage into Outer Space, its infinite abyss of galaxies, stars, planets and asteroids, has been fueled by mankind’s insatiable appetite for discovering and conquering the ‘final frontier’. While initial developments in Outer Space were pioneered by the States, recent developments in Space Exploration, suggest a subtle transition towards more extensive privately driven space initiatives. In the past decade, alone, private ‘non-governmental entities’ such as Planetary Resources and Mars One have expressed ambitious plans to exploit mineral resources in nearby asteroids and establish colonies in Outer Space, respectively. With a range of private actors from The Lunar Embassy to

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1 LLB (Hons) (Murdoch University), GDLP (Australian National University). I would like to thank Dr Jürgen Bröhmer for his invaluable expertise, support and encouragement throughout this thesis. All errors remain my own.


5 Planetary Resources, Planetary Resources’ First Spacecraft Successfully Deployed, Testing Asteroid Prospecting Technology on Orbit (16 July 2015)
American entrepreneur, Dennis Hope,\(^7\) selling millions of plots on the Moon, Mars, and other celestial bodies for as low as US$19.99, this raises some interesting, albeit difficult questions: Can private ‘non-governmental’ entities assert legally valid claims on the surface and subsurface of the Moon and Other Celestial bodies without an overriding sovereign? If so, what amounts to a ‘legally valid’ claim?

**B Aim of Thesis**

While the right to property remains an inalienable right, predominantly embodied in natural law traditions and Article 17 of *Declaration of the Rights of Man and of the Citizen*,\(^8\) it remains grossly uncertain whether this fundamental right to property may extend to Outer Space. Although the Outer Space Treaty expressly precludes the ‘sovereign appropriation’ of the Moon and Other Celestial bodies,\(^9\) it remains unclear till today whether these exclusions extend to private ‘non-governmental’ entities. More importantly, the Outer Space Treaty fails to establish any positive property rights regime on the use of extraterrestrial land or minerals in Outer Space.\(^10\)

Despite extensive literature on the States’ inability to assert sovereignty in Outer Space, few studies have analysed whether private entities would be

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\(^{7}\) Ibid.

\(^{8}\) *Déclaration des Droits de l’Homme et du Citoyen de 1789* [Declaration of the Rights of Man and of the Citizen 1789] (France) art 17 (‘Declaration of the Rights of Man’).

\(^{9}\) *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, opened for signature 27 January 1967, 610 UNTS 205 (entered into force 10 October 1967) art II (‘Outer Space Treaty’).

\(^{10}\) Wayne N White, ‘Real Property Rights in Outer Space’ (Paper presented at the 40th Colloquium on the Law of Outer Space, 1998) (‘Real Property Rights’).
able to assert private property rights, in a legal vacuum, without any overriding sovereign authority. The subtle distinction between private property rights ‘conferred’ by the sovereign and property rights merely ‘recognised’ by the sovereign, remains relatively unexplored in the existing scholarly literature. Moreover, the epistemological foundations of property rights are rarely considered.

Recognising the ambiguities plaguing the existing extraterrestrial property rights regime, this thesis aims to address some difficult, albeit fundamental, concerns by:

(a) Identifying the need for ‘non-governmental’ entities to assert private property claims on the surface and subsurface\textsuperscript{11} of the Moon and Other Celestial Bodies;

(b) Identifying and critically evaluating the existing property rights regime under the Outer Space Treaty,\textsuperscript{12} Moon Agreement\textsuperscript{13} and International Customary Practices;

(c) Comparing existing Outer Space property regime with the other legal regimes governing the use of the global commons on Earth including Antarctica\textsuperscript{14} and the Deep Seas\textsuperscript{15} in search for a better system;

(d) Making suggestions to clarify the operation of the ‘national non-appropriation clause’,\textsuperscript{16} ‘province of mankind’\textsuperscript{17} doctrine and ‘equitable use’\textsuperscript{18} of the Moon and Other Celestial Bodies; and

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\textsuperscript{11} This includes structures attached to the surface of the Celestial body and resources found in its subsurface.

\textsuperscript{12} Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, opened for signature on 27 January 1967, 610 UNTS 205 (entered into force on 10 October 1967) (‘Outer Space Treaty’).

\textsuperscript{13} Agreement Governing the Activities of States on the Celestial Bodies, opened for signature on 18 December 1979, 1363 UNTS 3 (entered into force on 11 July 1984) (‘Moon Agreement’).

\textsuperscript{14} Antarctic Treaty opened for signature on 1 December 1959, 402 UNTS 71 (entered into force on 23 June 1961).


\textsuperscript{16} Outer Space Treaty art 2.

\textsuperscript{17} Ibid art 1.

\textsuperscript{18} Moon Agreement art 11.
Proposing a reform of the existing Outer Space property rights regime by calling for a ‘new’, less restrictive, public trust doctrine.

C Structure and Methodology

Adopting a doctrinal reform oriented methodology,19 this thesis contends that the existing Outer Space property rights regime is so uncertain and ambiguous that even if a private entity were to occupy the surface of a celestial body, it remains unclear whether this ‘act’ would constitute a ‘legally valid’ claim under the Outer Space Treaty. Drawing on the terrestrial analogies of the Deep Seabed, Antarctica and the Arctic, this thesis proposes to critically evaluate the possibility of private property rights in land without any overriding sovereign. Lastly, recognising the significant impediment of the Common Heritage of Mankind (CHM) doctrine to any future developments of the private property rights regime in Outer Space, this thesis advances a ‘new’ interpretation of communal property. By adopting the Lockean epistemology on property,20 this thesis critically redefines Hugo Grotius’ mare liberum.21 Admonishing the traditional conception of the CHM doctrine, and replacing it with the Lockean labour theory of property, this thesis ultimately advances a less restrictive legal regime by calling for a ‘new’ public trust regime where the ‘legal title’ is vested in the private entity, as the trustee, to hold the trial property for the benefit of ‘mankind’.

In line with the Lockean theory of property, this thesis undertakes the mammoth task of re-construing the ‘benefit of mankind’ principle from an obligatory ‘profit sharing’ mechanism to the creation of new resources and

21 Hugo Grotius, The Freedom of the Seas, or the Right which Belongs to the Dutch to Take Part in the East Indian Trade (R van Deman Mangoffin trans, Oxford University Press, 1916) 29 [trans of: Mare Liberum sive de iure quod Batavis Competit ad Indicana Commercia (first published 1609)].
opportunities for ‘mankind’ as a whole. By relying on the less restrictive interpretation of the ‘benefit of mankind’ principle advanced in Locke’s labour theory of property, this thesis asserts that property bestowed upon mankind in common may be privately appropriated to enhance its ‘common stock’ as:

[H]e that encloses land … [derives a greater utility] from ten acres, [than] he could have from a hundred left to nature, [and] may truly be said to give ninety acres to mankind.  

Adopting a logical progression of ideas as detailed below, Part II and III of this thesis scrutinizes the ambiguities in the existing property rights regime and works of highly qualified publications, respectively. Part IV will critically assess the terrestrial regimes governing the high seas, Antarctica and Arctic in search for useful analogies for private property rights to be asserted in land without any overriding sovereign. Proposing a ‘new’ public trust doctrine to introduce greater certainty in the existing Outer Space property rights regime, Part V of this thesis, will critically re-examine the existing *res communis* nature of property in Outer Space.

**Part II — The Existing Property Rights Regime**

Part II of this thesis critically examines the sources of property rights in Outer Space including:

(a) International Conventions and Treaties;
(b) Customary International Law;
(c) Generally recognised principles of law; and
(d) Judicial decisions.  

Adopting both a literal and originalist interpretation of the Outer Space Treaty (OST) and the Moon Agreement (MA), Part II of the thesis examines the scope and application of certain key provisions such as the ‘freedom principle’, ‘national appropriation principle’ and ‘State authorisation

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22 Locke, Second Treatise, above n 20, ch 5 [37].
23 See *Statute of the International Court of Justice* art 38.
principle’ which may apply to private entities seeking to appropriate land and resources in Outer Space. Despite the lack of extensive judicial discourse on the validity of private property rights in Outer Space, three key cases in the Russian Courts (‘Bai’s Tempel 1’),24 USA Courts (Nemitz case)25 and Canadian Courts (Langevin case)26 are thoroughly analysed for clues on the viability of private property rights in Outer Space. Part II of the thesis claims that:

(a) the issue of private property rights remains largely undefined in the absence of clear treaty provisions and disparaging judicial literature;

(b) the pre-existing ambiguities must be resolved before the commercialisation of Outer Space begins; and

(c) private property rights may be permissible in Outer Space in the absence of any recognisable laws if the controversial ‘residual negative’ rule applied.

Part III — From Martian to Lunar Real Estate: Are Private Entities Capable of Asserting Property Rights in Outer Space?

To overcome the ambiguity in the existing legal regime, Part III of this thesis, critically evaluates the scarce, albeit diametrically opposite arguments advanced in works of highly qualified publications. Three commonly held views are scrutinised and critically evaluated. These include the strong, a forori, arguments:

(a) forbidding private property rights in Outer Space;

(b) promoting a full set of private property rights in Outer Space; and

(c) promoting a valid, albeit unrecognisable, property right in Outer Space.

Rejecting the arguments on both ends of the spectrum, this chapter asserts that the functional property rights may serve as the most accurate depiction of private property rights under the existing regime. In other words, this

26 Re Langevin [2012] QCCS 613 (Superior Court of Québec).
chapter will assert that real property rights in Outer Space may only be asserted within a ‘facility’ such as a ‘space station’ attached to the surface or subsurface of the extraterrestrial body.

Part IV — Terrestrial Property Rights: Lessons from Antarctica, The Deep Seabed and the Arctic

Part IV of this thesis will critically examine the development of the private property rights regime in resource rich territories with non-existent claims of sovereign. While the deep seabed and Antarctica, serve as logical comparisons for future developments of private property rights in communal property such as Outer Space, the Arctic islands of Jan Mayen, Spitzbergen and Sverdrup offer unique analogies for the recognition of private property rights in land without a sovereign. Part IV of the thesis will raise two fundamental claims that:

(a) a simple cut and paste regime would be inappropriate to fit into the \textit{lex specialis} of Space law; and

(b) private property claims asserted in land without a sovereign, is likely to be recognised subsequently, at a later date.

Part V — The Solution: Overcoming an Unworkable Property Rights Regime

Part V of this thesis examines the nature of property in Outer Space, namely whether the Moon and other celestial bodies are terra nullius territory, available for anyone to appropriate on a first come first served basis, or terra communis and therefore incapable of private appropriation. Expanding on the limitations of the CHM doctrine, Part V of the thesis will claim that:

(a) application of the CHM doctrine may lead to the over-exploitation of land and resources in Outer Space, a problem commonly known as the tragedy of the global commons;

(b) the ‘free access’ provision suggested by Hugo Grotius needs to be re-valuated using a Lockean epistemology;
(c) property bestowed upon man in common need not remain communal property as evidenced in the 19th century homesteading movement in the USA; and

(d) a ‘new’ public trust doctrine must be superimposed onto the Outer Space legal regime to avoid any pre-existing ambiguities.
II THE EXISTING PROPERTY RIGHTS REGIME

On the Moon ... or any other planets

... apart from the laws of ‘Head Cheese’, currently no law exists

The Lunar Embassy

A Sources of Property Rights in Outer Space

At a cursory glance, Public International Law may be arbitrarily dismissed for having little utility in ‘private property rights’ which remains largely entrenched in municipal or domestic laws. Nevertheless, a detailed analysis may reveal otherwise. While lacking the intention of dealing with affairs beyond the State, Public International Law, may nevertheless, have the ‘capacity’ to govern private property rights. This is best illustrated by the jus cogens, preeminent norm, that prohibits slavery and by its extension, ownership of a person. Public International Law has always considered property rights in conventions ranging from the Vienna Convention on the Succession of the States to the use and appropriation of resources in the global commons. Hence, pursuant to Article 38 of the Statute of the International Court of Justice (ICJ), the following sources of law may be

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29 Pop, The Moon, above n 28, 35–6. Public International Law may be useful as a ‘quasi-municipal law’ for property on the Moon and other Celestial bodies.
30 Ibid 36.
31 ‘Report by Mr H Lauterpacht, Special Rapporteur’ (1953) II Yearbook of the International Law Commission 90, 154–5; Slavery Convention, signed on 25 September 1926, 60 UNTS 253 (entered into force 9 March 1927) art 1(1) states that ‘[s]lavery is the status or condition of a person over whom any or all of the powers attaching to the right of ownership are exercised’.
33 Antarctic Treaty art IX; UNCLOS art 137.
regarded as useful in establishing the existing property rights regime in Outer Space:

(a) International Conventions;
(b) Customary International Law;
(c) Judicial decisions; and
(d) Highly qualified publications.\(^\text{34}\)


1 The Outer Space Treaty

The Outer Space Treaty (OST),\(^\text{35}\) remains a monumental treaty commonly regarded as the constitution of the Corpus Juris Specialis.\(^\text{36}\) Developed in an era following the Cold War and the Soviet Union’s launch of the world’s first satellite, Sputnik 1,\(^\text{37}\) the OST sought to promote the peaceful use and exploration of Outer Space amongst States, especially Russia and the United States of America (USA), which were the only two ‘superpowers’ with the ability and willingness to fuel space research.\(^\text{38}\) While the Ad Hoc Committee\(^\text{39}\) dealt with matters ranging from mankind’s peaceful use and exploration of Outer Space to affording all States opportunities to benefit equally regardless of their ‘stage of economic development’,\(^\text{40}\) the

\(^{34}\) Statute of the International Court of Justice art 38. While the International Court of Justice (ICJ) only has jurisdiction to hear disputes between state parties, article 38 of the Statute of the ICJ nevertheless offers a promising start to consider the sources of International Law that apply to Outer Space.

\(^{35}\) Outer Space Treaty arts I, II, VI.


\(^{37}\) Tronchetti, above n 36.

\(^{38}\) BBC, About Sputnik 1 <http://www.bbc.co.uk/science/space/solarsystem/space_missions/sputnik_1>.

\(^{39}\) The Ad Hoc Committee on the Peaceful Uses of Outer Space was established by the General Assembly resolution, 1348 (XII), passed on 13 December 1958. See Tronchetti, above n 36, 14–8 for detailed discussions on the historical developments and debates by the legal subcommittee in Outer Space.

\(^{40}\) International Co-operation in the Peaceful Uses of Outer Space, UN GAOR, 1st Comm, 14th sess, 856th plen mtg, UN Doc A/RES/1472(XIV)A (12 December 1959); International Co-operation in the Peaceful Uses of Outer Space, UN GAOR, 1st Comm, 16th sess, 1085th plen mtg, UN Doc A/RES/1721(XVI) A–E (20 December 1961); Declaration of Legal Principles Governing the Activities of States in the
exploitation of extraterrestrial resources was left to be tackled at a later date when it became a possibility.  

As the appropriation of surface and subsurface of the Moon and Other Celestial bodies remained an unfathomable phenomenon during the early negotiations of the OST, most of the provisions of the OST deal specifically with the State’s ability to explore and use Outer Space. The provisions dealing specifically with extraterrestrial property rights remain extremely scarce. Nevertheless, Article I (‘The Freedom Principle’), Article II (‘The Non-Appropriation Principle’) and Article VI (‘State’s Responsibility for Private Entities in Outer Space’) of the OST, may provide some valuable insight on the commercial ‘use’ and ‘exploitation’ of extraterrestrial land and resources by private non-governmental entities.

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41 Exploration and Uses of Outer Space, UN GAOR, 1st Comm, 18th sess, 1280th plen mtg, UN Doc A/RES/1962(XVIII) (13 December 1963). The United Nations’ 1962 Resolution (XVIII) and the OST provisions remain identical. Countries such as the United States, Soviet Union and United Kingdom drafted proposals which formed the groundwork for regulation of activities in Outer Space.

42 N Jasentuliyana, ‘Article I of the Outer Space Treaty Revisited’ (1989) 17 Journal of Space Law 129, 141 (‘Article I Revisited’). Note, however, that Article VI of the OST imposes an obligation on States to regulate the activities of private non-governmental entities in Outer Space. For a more detailed analysis of Article VI refer to the heading ‘State’s Responsibility for the Actions of Nationals’, below.

43 Pop, The Moon, above n 28, 37.

44 Outer Space Treaty art I.

45 Ibid art II.

46 Ibid art VI.

(a) The Freedom Principle

Pursuant to Article I of the OST:

The exploration and use of outer space, including the Moon and other celestial bodies shall be carried out for the benefit and in the interests of all countries ... and shall be the province of all mankind.48

As renowned space law scholar, Jasentuliyana, contended that the objective of Article I explicitly calls for the ‘use’49 and exploration of Outer Space for the ‘benefit’ and ‘interest’ of all States to meet the ‘essential needs of mankind’.50 While the provision expressly promotes co-operation amongst States,51 it remains largely unclear how this provision would apply to non-governmental entities, which are often not susceptible to ‘strict regulatory control’ by States.52 The definition and scope of the ‘province of mankind’ concept, alone, remains a highly debated issue amongst legal scholars for more than three decades before retiring to the question of political discourse.53 Nevertheless, the vague construction of Article I begs the question whether it serves merely as a moral obligation or a legally recognised obligation in law.

48 Outer Space Treaty art I.
50 Jasentuliyana, Article I Revisited, above n 42, 139–40.
51 Ibid 141.
52 Ibid.
53 J I Gabrynowicz, ‘The Province and Heritage of Mankind Recognised a New Beginning’ (Paper presented at the 2nd Conference on Lunar Bases and Space Activities, Houston, April 1988) 691, 692. Recognising the absence of an exact definition and scope of ‘the mankind provision’, Gabrynowicz, aptly summarises this struggle as ‘space lawyers ... arguing the number of angels that can sit on the head of the pin’ without the requisite political will.
Although scholars such as Bin Cheng contend that Article I of the OST serves as nothing more than a declaratory provision lacking any legal effect, others assert that the deliberate use of the word ‘interests’, rather than ‘interest’, is sufficient to impose ‘specific’ and ‘identifiable’ obligations. Nevertheless, even if it is found that Article I imposes a positive obligation to carry out activities in the ‘interests of all countries’, it remains unlikely that it would be interpreted to expressly exclude ‘use’ and ‘exploitation’ of Outer Space by private non-governmental entities. While defining the exact ‘interest of all countries’ remains a problematic question of policy, it is likely that all private property claims on the surface and subsurface of extraterrestrial bodies may be regarded as:

(a) Unlawfully benefiting only some countries;
(b) Unlawful unless the profits of the commercial ventures are distributed to all States without incurring corresponding costs;
(c) Lawfully providing a non-discriminatory system for the purchase of the resources by other States and private entities; and
(d) Lawful unless its ‘use’ of the extraterrestrial surface and its resources precludes others from doing the same.

57 Lee, Commercial Mining, above n 47, 161.
58 Ibid.
59 Ibid.
60 Ibid.
(b) The Non Appropriation Principle

Despite warranting only ‘a few minutes’ of discussions by the drafters, Article II of the OST, remains one of the most contentious provisions amongst the existing space law academics. Article II of the OST expressly stipulates:

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.

As the OST failed to provide any clear definition of the term ‘national appropriation’ and ‘by any other means’ in the OST, Article II remained susceptible to numerous conflicting interpretations. It continues to be largely unclear whether Article II of the OST would prevent private non-governmental entities from asserting private property rights in Outer Space.

61 Jasentuliyana and Lee, Manual on Space Law, above n 49.
64 Summary Record of the 71st Meeting, UN GAOR, 5th sess, 71st mtg, UN Doc A/AC.105/C.2/SR.71 (21 October 1966) 15–6; S Gorove, ‘Interpreting Article II of the Outer Space Treaty’ (1969) 37 Fordham Law Review 349 (‘Interpreting Article II’). Gorove expounds on three key uncertainties in Article II of the Outer Space Treaty including the lack of defined boundaries between airspace and outer space, the impact of the national non-appropriation principle on private entities and the undefined scope of ‘appropriation’ concept.
65 Jijo and Job, above n 62.
While advocates of space law, such as Wasser, favour a literal interpretation of the Article II, relying heavily on its failure to expressly exclude the phrase ‘private appropriation’, others warn against reading the provision in isolation. Subscribers of the latter school of thought argue that the analogy of private entities being ‘controlled’ and ‘supervised’ by the State automatically amounts to an act of ‘national appropriation’ and therefore precluded by Article II of the OST. A detailed analysis of the drafters’ intentions in the travaux préparatoire, on the other hand, suggests a deliberate exclusion of the phrase ‘by human activity’.

Nevertheless, it remains highly uncertain whether the term ‘national appropriation’ merely translates to ‘national sovereignty’ or is capable of a wider interpretation to exclude private property rights in Outer Space. A similar exclusionary provision adopted in Article 137 of the United Nations Convention on the Law of the Sea (UNCLOS), suggests a subtle, albeit important, distinction between the term ‘appropriation’ and ‘sovereignty’.

66 Wasser and Jobes, above n 62; Carl Q 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 The International Lawyer 429, 448 (‘The CHM Provision’); Gorove, Interpreting Article II, above n 64, 351. Drawing on Article 11(3) of the Moon Agreement, which expressly precludes private non-governmental entities from asserting exclusive property rights on the surface and subsurface of the Moon and other celestial bodies, Christol suggests that Article II is distinct. Christol and Gorove further contend that the term ‘national appropriation’ must not be mistaken for preventing private property rights asserted in Outer Space.


68 Ibid. See also Outer Space Treaty art VI.


70 Cf Lee, Commercial Mining, above n 47, 169. Lee suggests that both the ‘national appropriation’ and ‘national sovereignty’ phrases are identical in its application.
Pursuant to Article 137 of the UNCLOS, while States cannot assert ‘sovereignty’ on any part of the deep seabed or its resources, both the State and private entities\(^{71}\) are prohibited from ‘appropriating’ any part of the deep seabed.\(^{72}\) Although the ability to assert territorial sovereignty applies exclusively to States,\(^{73}\) customary international law recognises that both States and private entities have the ability to ‘appropriate’ land by establishing ‘title’ or ‘exclusive’ possession.\(^{74}\)

In the absence of more, it may be reasonable to conclude that the phrase ‘national appropriation’ in Article II of the OST implies nothing more than an ‘exercise of territorial sovereignty’ by States in Outer Space.\(^{75}\) As Stevenson, a delegate representing USA, contended that the national appropriation principle applying to States should not extend to private entities as:

> Freedom of space and of celestial bodies, like the freedom of the seas … [implies that] man should be free to venture into space without any restraints except those imposed by the laws of his own nation and by international law, including the United Nations Charter.\(^{76}\)

On the contrary, it remains equally unlikely that the limitations placed on sovereign States would automatically translate to private entities by virtue of their ‘citizenship’ or place of incorporation.\(^{77}\) While claims of extraterrestrial land are governed by the \textit{lex situs} of Outer Space, resources

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\(^{71}\) Private entities include both natural and juridical persons.

\(^{72}\) \textit{UNCLOS} art 137. Pursuant to article 137 of UNCLOS, the appropriation of the deep seas by any State or juridical person remains prohibited.

\(^{73}\) Lee, Commercial Mining, above n 47, 169.

\(^{74}\) Gorove, Interpreting Article II, above n 64, 351; White, Real Property Rights, above n 10.

\(^{75}\) Lee, Commercial Mining, above n 47, 169.

\(^{76}\) \textit{Report of the Committee on the Peaceful Uses of Outer Space}, UN GAOR, 1\textsuperscript{st} Comm, 16\textsuperscript{th} sess, 1210\textsuperscript{th} mtg, Agenda Item 21, UN Doc A/C.1/SR.1210 (4 December 1961) [4]. Stevenson contended that although it was in the best interest to prevent national appropriation by States, he proclaimed that men, on the other hand should not be subject to similar restrictions.

extracted from the Moon and other celestial bodies are likely to be governed by the *lex domicili* of the private entity responsible for extracting the resources. As the laws governing property rights depend on the ‘location’ of the property, any claims of extraterrestrial land would have to be recognised by extraterrestrial laws. The extraction of resources, however, flows from the laws governing the private entity’s permanent legal residence or place of origin. As C Sweet succinctly suggests *minerals*, ‘[w]hile unsevered, … from part of the land, and as such are real estate. When severed they become personal chattels’.

The traditional rule of *potestas finitus ubi finitur armorum vis*, commonly known as the ‘cannon shot rule’ implies that the concept of sovereignty has always been subject to spatial limitations. While the exact vertical limits of sovereignty remains a highly contentious issue amongst space law scholars, most agree that all claims of sovereignty by nations end at the boundary where ‘air space’ transitions into ‘outer space’. As the Moon and other celestial bodies, unlike geostationary orbits, do not fall directly above any one State, or group of States, it is ‘ludicrous’ to suggest that the activities of private entities would automatically amount to ‘sovereign appropriation’ which remains prohibited by Article II of the OST.


79 Ibid.

80 Ibid.

81 C Sweet, *A Dictionary of English Law* (Sweet, 1882) 259; See also Pop, The Property Status, above n 78.


84 Michael J Finch, ‘Limited Space: Allocating the Geostationary Orbit’ (1985) 7 *Northwestern Journal of International Law and Business* 788, 790–1; *Declaration of the First Meeting of Equatorial Countries* (adopted on 3 December 1997) ITU Doc WARC-BS-81-E (‘Bogotá Declaration’). The Bogotá Declaration was created when eight equatorial States grouped together to assert sovereignty on the geostationary
(c) States’ Responsibility for Private Acts

Article VI of the OST imposes a positive obligation on States to ‘authorise’ and ‘supervise’ the activities carried out by private, non-governmental entities in Outer Space. Some renowned space law scholars, such as Jasentuliyana contend that Article VI of the OST imposes a minimum obligation for private entities to abide by governmental imposed regulations. Calling for a State regulated licensing scheme, Jasentuliyana further suggests that unregulated private activities must be strictly prohibited even if it becomes a common occurrence in the near future.

A similar approach is adopted by Kerrest who suggests that:

‘States have personal jurisdiction over their nationals … must keep the capacity to implement international law in general and space law in particular to make it applicable to their citizens’

This interpretation is particularly problematic, as it remains largely impossible to define the exact scope of a State’s obligations amidst the ambiguous treaty provisions. Moreover, it remains practically impossible to enforce State legislation on a foreign domiciled national engaging in space activities. Pursuant to the doctrine of State responsibility, the orbit directly above them. Nevertheless, this deliberate attempt to assert sovereignty on the geostationary orbit was dismissed in International Law.

State 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 organisation, responsibility for compliance with this Treaty shall be borne by the international organisation and by the State Parties to the Treaty participating in such organisation.

Ibid.
Lee, Commercial Mining, above n 47, 130–3.
Ibid 132.
activities of private non-governmental entities may constitute an ‘act of a State’ if it is:

(a) Expressly sanctioned by the government (Article 5);\textsuperscript{91}
(b) Directed and controlled by the State (Article 8);\textsuperscript{92} or
(c) Expressly adopted and recognised by the State as its own (Article 11).\textsuperscript{93}

As a ‘general conception of the law’, the doctrine of State responsibility, imposes a positive obligation on States to make reparation for failing to adhere by its international obligations.\textsuperscript{94} For example, in \textit{Hyatt International Corporation v Iran},\textsuperscript{95} the tribunal held that the expropriations of a foundation, ‘established’ and sanctioned by the government to identify property for seizure, imposed a liability on the State.\textsuperscript{96} If the right to property is defined as a positive right granted by the sovereign,\textsuperscript{97} any recognition of property rights by private but State empowered entities, similar to the East India Company,\textsuperscript{98} may be regarded as an ‘act of a State’ prohibited by the national non-appropriation principle (‘Article II’) discussed above.

\textsuperscript{92} Ibid art 8.
\textsuperscript{93} Ibid art 11.
\textsuperscript{94} \textit{Chorzów Factory (Merits) (Germany v Poland)} [1928] PCIJ (ser A), No 17, 29.
\textsuperscript{95} Pursuant to the State responsibility principle:
\textsuperscript{96} any breach of an engagement involves an obligation to make reparation … the Court has already said that reparation is the indispensible complement of a failure to apply a convention, and there is no necessity for this to be stated in the convention itself.
\textsuperscript{97} Hyatt \textit{International v Iran (Interlocutory Award)} (1985) 9 CT Rep 72, 88–94.
\textsuperscript{98} Ibid. ILC, Draft Articles on State Responsibility, above n 91. The ‘power of detention’, ‘immigration control or quarantine’ are powers that innately rests with the State. If these powers are delegated to private entities under State legislation, the State remains liable for the breaches which may ensue. James Crawford, \textit{The International Law Commission’s Articles on State Responsibility: Introduction, Text and Commentary} (Cambridge University Press, 2002) 100. Crawford suggests that the State may be equally responsible for ‘quasi-public’ or ‘private entities’ created or governed by State laws.
\textsuperscript{100} Stephen D Krasner, ‘Sovereignty’ (2001) 122 \textit{Foreign Policy} 20; Jasentuliyana and Lee, \textit{Manual on Space Law}, above n 49, 17. States may not use the privatisation of national appropriation activities on the Moon and other celestial bodies to avoid its international obligations under the existing Outer Space Treaty.
Prima facie, Article VI of the OST may be taken to mistakenly equate private property rights as an ‘act of the State’ requiring the ‘authorisation’ and ‘control’ of the State.\textsuperscript{99} State control, in itself, imposes an onerous burden that may often be difficult to establish.\textsuperscript{100} As illustrated in the \textit{Nacaragua} case, a State must impose both ‘actual’ and ‘effective’ control over the actions of a private entity to satisfy the requirement of State control.\textsuperscript{101} Even if a lower threshold is adopted, similar to the recent \textit{Tadic} case,\textsuperscript{102} it is unlikely that ‘mere financing and equipping … participat[ing] in planning and supervision’ would be sufficient to establish the requisite ‘control’.\textsuperscript{103}

The National Aeronautics and Space Administration’s (NASA) financial grants\textsuperscript{104} and assistance\textsuperscript{105} to private entities, for example, fail to satisfy the lower standards of ‘State control’. In the absence of express State legislation ‘controlling’ or ‘authorising’ private property claims in Outer Space, even the acts of wholly private entities, such as the Archimedes Institute asserting State like powers by maintaining a registry of property claims in Outer Space, is unlikely to establish the requisite nexus to

\begin{footnotes}
\item[99] Tennen, Emerging Systems, above n 67. In forwarding this argument, Tennen strongly opposes reading Article II of the Outer Space Treaty in isolation without considering the obligation of states to ‘authorise’ and ‘control’ private activities in Outer Space.
\item[101] \textit{Military and Paramilitary Activities in and against Nicaragua (Nicaragua v United States of America) (Merits)} [1986] ICJ Rep 14 (‘Nicaragua Case’) 62–4. In the Nicaragua case, the International Court of Justice held that the state had imposed obligations on some of the paramilitary operations being carried out by a private entity.
\item[102] \textit{Prosecutor v Tadic (Appeals Chamber Judgment)} Case No 94-IT-1-T (15 July 1999), 38 ILM 1518 (‘Tadic Case’). The requisite level of ‘control’ may vary according to the facts of the case.
\item[103] Ibid [145].
\item[104] National Aeronautics and Space Administration, \textit{Commercial Crew and Cargo} <http://www.nasa.gov/offices/c3po/partners/ccdev_info.html>. NASA has provided four private entities financial grants to assist them in the development of commercial space activities including the development of spaceships which may launch humans into outer space.
\end{footnotes}
constitute an ‘act of the State’. Moreover, it remains equally unlikely for States to issue decrees in support of the assertion of private property rights in Outer Space.

2 The Moon Agreement

Although the Moon Agreement failed to secure widespread acceptance amongst the international community, academics such as Galloway and Gorove highlight its utility in clarifying the interpretation of Article II of the OST. Despite its remarkable resemblance with ‘national non-appropriation’ principle in Article II of the OST, Article 11(3) of the Moon agreement provides an additional requirement that:

Neither the surface nor the subsurface of the Moon, nor … natural resources … shall become the property of any State, intergovernmental or non-governmental organisation … non-governmental entity or of any natural person

Prima facie, Article 11(3) imposes a positive obligation on private ‘non-governmental entities’ against asserting any property rights on the Moon. Nevertheless, it remains unclear whether the application of this provision is spatially limited to apply only to the Moon or extends to other celestial bodies such as Mars and other nearby asteroids. Moreover, some leading

106 White, Real Property Rights, above n 10, 171–2; Chirwa, above n 100, 9.
107 See Diplomatic and Consular Staff Case (United States of America v Iran) [1980] ICJ Rep 3. The International Court of Justice held that the acts of militants, expressly approved by a decree issued by the Government, was sufficient to impose responsibility on the State.
108 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, opened for signature 5 December 1979, 1363 UNTS 3 (entered into force 11 July 1984) (‘Moon Agreement’).
110 Moon Agreement art 11; Lee, Article II of the OST, above n 69, 131–2.
111 Nicolas M Matte, ‘Treaty Relating to the Moon’ in Nadasiri Jasentuliyan and Roy Lee (eds), Manual on Space Law (Oceana Publications, 1979) 253, 257. While some States such as the Soviet Union, Bulgaria, Poland, Egypt, France and Japan contended that the application of the Moon Agreement remained limited to the Moon, others
space law academics such as Gorove, Christol and Lee contend that Article 11(3) of the Moon Agreement may be used to suggest that the ‘national appropriation’ provision in the OST (Article II) was never intended to constitute ‘an all-inclusive’ phrase.

C Customary International Law

It is largely acknowledged that the freedom of use and exploration principle (Article I), national appropriation principle (Article II) and State responsibility principle (Article VI) form a widely accepted customary international law as it has been ratified by a significant number of States and even States who are not parties to the treaty. The OST treaty has been ‘accepted’ and ‘recognised’ by a significant number of States as a form of customary international law. Some space law scholars such as Qizhi He, suggest that the principles found in the OST crystallised into international customary norms even before the conclusion of the treaty. Although the process of creating customary international law is usually inverted, the extensive State compliance of the United Nations Space Resolutions reaffirms the proposition that the OST merely codified and enhanced these pre-existing principles of customary international law. Despite this, the

including the United States, United Kingdom, Canada, Australia, Belgium, Romanian and Iran favoured the extension of the treaty to all celestial bodies.

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112 Gorove, Interpreting Article II, above n 64.
113 Christol, above n 66, 437.
114 Lee, Article II of the OST, above n 69, 131–2.
115 Ibid 126. Cheng, Studies In International Space Law, above n 36, ch 7; N M Matte, Space Activities And Emerging International Law (McGill University, 1984) 318.
119 Pop, The Moon, above n 28, 38; Statute of the International Court of Justice art 38. The ICJ defines international custom as the ‘general practice accepted [in] law’.
provisions of the Moon Agreement, ratified by a mere 13 States, may not be afforded the same status of *jus cogens*.  

Nevertheless, the provisions of the OST must not be regarded as ‘immutable’. It remained evident from the early discussions with the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) that a ‘comprehensive legal code may not be appropriate’. In its place, a ‘progressive approach’ was preferred to give effect to the advancements in Space technology. As Jereich and McCracken fervently contend, space law has the potential to ‘become more specific … [and give effect to] the international commercial aspects of man’s space endeavors’.

Although a new treaty may be enacted before it is technologically possible to assert property rights in Outer Space, the development of ‘customary law’ relies on ‘actual practice’. As the appropriation of Outer Space remains a distant reality, scholars such as Paxson contend that the OST should serve as the ‘first source of international law’ in Outer Space. Nevertheless, the distinction between ‘customary law’ and ‘treaty’ remains arbitrary as both have the potential to expand and evolve with the exploration and use of outer space.

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120 Kurt A Baca, ‘Property Rights in Outer Space’ (1993) 58 *Journal of Air Law and Commerce* 1041, 1068. Baca argues that it may not be ‘credible’ to accord the provisions of the Moon Treaty with the status of *jus cogens*. Cf Pop, The Moon, above n 28, 38. Pop suggests that some norms of the Moon Agreement, including the use of samples derived from Outer Space, may be regarded as Customary International Law.

121 Pop, The Moon, above n 28, 39.


125 Pop, The Moon, above n 28, 39.


customary law, it is likely to evolve with ‘actual practice’. With private entities such as James Benson sponsoring deep space missions to assert ‘ownership’ of near earth asteroids, the evolution of ‘customary law’ remains inevitable in favour of extraterrestrial property rights.

D Generally Principles of Law

General principles of law may serve as a good starting point for the development of a private property rights regime in Outer Space. According to renowned international law scholar, Hersch Lauterpatch, even principles of private law may be useful in the initial developments of international law. However, private law principles should be used sparingly only when they are applicable. In the context of Outer Space, for example, the use of Roman law principles of property, may result in a framework that is not only regressive, but chaotic.

Nevertheless the application of certain fundamental principles such as the ‘first come first served’ rule remains an issue of common sense. According to Lord Asquith, the progression of the law is often premised upon principles of ‘good sense’ and ‘common practice’ of civilized nations. Hence, it remains highly likely that the ‘first come first serve rule’ would prevail in Outer Space. In other words, the first private entity who manages to assert a legally valid claim to property on the Moon and other celestial bodies is likely to be given priority over all others.

References:

128 Ibid.
131 Ibid.
133 Pop, The Moon, above n 28, 39.
134 Lauterpatch, Oppenheim’s International Law, above n 130.
135 Benson, above n 129.
136 Ibid.
E Judicial Decisions

Over the years, private entities have sought to assert private property rights on the Moon and other celestial bodies. From the creation of James Thomas Mangan’s ‘micronation’ Celestia which claimed Outer Space in its entirety as property for mankind to A D Lindsay’s registration of the Moon and Saturn with the Irwin County Court in Georgia prior to the Apollo 11 landing, space enthusiasts have never shied away from creative ways to assert private property rights on extraterrestrial land. Despite this, the number of judicial decisions considering the issue of property rights in Outer Space is extremely scarce.

1 Yemenis’ Red Planet to Bai’s Tempel 1

While earlier claims of private property rights asserted by individuals have often been ridiculed and categorized as being frivolous, they bear testimony to the private entities’ zealous pursuit of property rights in Outer Space. Claiming Mars as their inheritance, three Yemen men, Adam Ismail, Mustafa Khalil and Abdullah al-Umari, attempted to initiate proceedings against NASA for landing its Pathfinder spacecraft and Sojourner rover, without seeking prior permission. While Brian Welch, NASA’s director of media, commented that Mars was collectively owned by mankind, he nevertheless acknowledged that ‘when people actually are going to these places … more complicated issues will have to be resolved’ as individuals commence their journey into Outer Space or discover its valuable

138 Lambert M Surhone, Mariam T Ennnoe and Sussan F Henssonow (eds), Nation of Celestial Space (Betascript Publishing, 2011). See also, Benjamin David Landry, ‘A Tragedy of the Anticommons’ (2013) 38 Brooklyn Journal of International Law 523, 574. Landry suggest that it may be possible to create a new state for space colonies to gain sovereignty in Outer Space.
139 Pop, The Moon, above n 28, 3.
140 Ibid 40.
142 Pop, The Moon, above n 28, 40.
143 CNN, above n 141.
Nevertheless, the claim never proceeded to trial after the Prosecutor General threatened the three Yemenis men with imprisonment.145

Similarly in Bai’s case, a Russian astrologer Marina Bai, contended that NASA’s collision with Comet Tempel 1, infringed upon her ‘spiritual values’, deforming her horoscope.146 Although Bai’s lawyer, Alexander Molokhov, contended that her claim of approximately £170 million remained well grounded in the law,147 NASA’s engineer, Shadan Ardalan, dismissed the proposition by comparing the collision to ‘a mosquito hitting the front of an airliner in flight’.148 Establishing the Russian’s court jurisdiction to rule on the dispute between NASA and Marina Bai, the Moscow City Court passed down the case to the Presnensky District Court to be reconsidered.149 However, the Russian District Court subsequently dismissed the case.150 Despite this, Bai’s claim remains interesting as it attempts to assert ‘control’ over Comet Tempel 1, without formally claiming ‘ownership of it’.151

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2 Langevin Case

In the recent Langevin case, the district court of Québec dismissed Sylvio Langevin’s claims of ownership on the Earth, Mercury, Venus, Jupiter, Jupiter’s four moons, Saturn and Uranus. These claims were subsequently amended to include celestial bodies like Neptune and Pluto and the ‘space’ between each planet across the galaxy. Learning of NASA’s missions to planets in the Solar System on 27 December 2011, Langevin seized this ‘unique opportunity’ to ‘mak[e] a collection as others do a hockey card collection’. In justifying his claims, Langevin contended that there was:

(a) no owner of the five planets (Mercury, Venus, Jupiter, Saturn and Uranus) and the four moons (Jupiter’s four moons);
(b) no owner of the planet Earth which undoubtedly remains a wandering star amidst the Solar System; and
(c) no viable respondent, except for God, who could not tangibly be present to respond to his queries.

Relying heavily on Judge Etienne Parent’s previous judgement, which dismissed Langevin’s claims on Mars and the Moon, the court rejected the claim for having no basis in the law. Ironically, the court failed to expand on the legal validity of private property claims on planets in the Solar system. Expounding on Langevin’s extensive litigation record consisting of more than 51 complaints, judge Alain Michaud suggested that Langevin was nothing more than a ‘vexatious litigant’ abusing the system and should be barred from initiating any further claims in the Court.
The Nemitz case,\textsuperscript{164} comically known as NASA’s twenty dollar parking infringement, marked a landmark decision in determining the validity of private property rights asserted on Asteroid 433 in Outer Space.\textsuperscript{165} In this case, Gregory William Nemitz, the owner of OrbDev, sent an invoice for US$20 to NASA for ‘parking’ or ‘storing’ its spacecraft, NEAR Shoemaker, on Eros.\textsuperscript{166} To justify his ownership of Eros, Nemitz furnished documents illustrating his registration of Eros with the Archimedes Institute\textsuperscript{167} and a California Uniform Commercial Code security interest claim naming himself as the creditor.\textsuperscript{168}


\textsuperscript{166} Letter from Gregory Nemitz, CEO of Orbital Development, to NASA, 16 February 2001 \texttt{<http://www.orbdev.com/010216.html>}

\textsuperscript{167} The Archimedes Institution, \textit{Gregory Nemitz, Asteroid 433 Eros, and NASA Shoemaker Probe} \texttt{<http://www.permanent.com/archimedes-institute.html>}
The Archimedes Institute maintains a registry of claims in Outer Space. Nemitz registered his claim on Eros 433 with the Archimedes Institute prior to NASA’s landing on the asteroid.

\textsuperscript{168} Nemitz \textit{v} United States (Nev, No CV-N-03-0599-HDM-RAM, 27 April 2004) 2 (McKibben J).
Edward A Frankel, NASA’s General Counsel, refused to pay the sum stipulated on the invoice as Nemitz’s claim failed to establish ‘any legal basis … to own Eros or to any legal significance of a filing with the Archimedes Institute’. Pursuant to the arguments forwarded in Nemitz’s earlier correspondence with NASA suggested that:

(a) An ‘object’ that is not owned is capable of ownership by any person who first ‘sights’ the opportunity;

(b) Private individuals, unlike States, are not prohibited by the law from asserting property rights in Outer Space; and

(c) Physical possession is unnecessary to establish ownership of property. Instead, property may be claimed if the claimant

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169 National Aeronautics and Space Administration, NEAR Shoemaker <http://science.nasa.gov/missions/near/>.


171 Nemitz’s Response Letter, above n 170.

172 Ibid.
possesses the requisite ‘intention to possess’ the property at a later date or add his own efforts to enhance the property.¹⁷³

Fervently contending against his claim being regarded as ‘premature’ or ‘inappropriate’, Nemitz suggested that he held the ‘highest’ proprietary claim on Eros 433.¹⁷⁴

**Figure 2: Eros Surface**¹⁷⁵

¹⁷³ Ibid.
¹⁷⁴ Ibid.
Although Nemitz’s claim for compensation under ‘breach of contract’ was subsequently dismissed by the Federal Court, Nemitz sought a declaration from the District Court determining the ability of private entities to ‘own’ and ‘acquire’ property rights in Outer Space. Asserting a violation of Public Law and his constitutional rights, Nemitz argued that his *jus dividium* property rights on Eros depended upon ‘the natural inherent rights of man, the common law and … the Federal Constitution’. Despite recognising himself as the ‘free’ and ‘natural’ owner of Eros, Nemitz implored the court to carefully consider whether ‘actual possession’ was necessary to assert property rights in Outer Space. Substantiating his arguments in favour of private property rights in Outer Space, Nemitz contended that:

(a) NASA’s use of Eros without ‘just’ compensation was ‘unconstitutional’ (fifth amendment),

(b) The right to property in Outer Space cannot be ‘denied’ by NASA as it violates the fundamental rights retained by the ‘free and natural, living man’ (ninth amendment), and

(d) NASA acted outside its authority, by reaching an adverse conclusion on Nemitz’s proprietary claim, as the right to private property remains ‘reserved’ by the people and not the government (tenth amendment).

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177 Plaintiff’s Complaint for Declaratory Judgment, above n 164, 3.

178 *National Aeronautics and Space Act of 1958*, Pub L No 85-568, § 102, 72 Stat 426. Pursuant to § 102 all activities in Outer Space must be conducted in the interest of broadening ‘human knowledge’, enhancing the ‘usefulness, performance, speed, safety and efficiency’ of space exploration, ensuring the peaceful use of space technology and advancing ‘long-range’ scientific studies in Outer Space.

179 Plaintiff’s Complaint for Declaratory Judgment, above n 164, 5, 9.

180 Ibid 11.


182 Ibid 17. Article V of the United States Constitution prevents private property from being taken ‘for public use, without just compensation’.

183 Ibid 18. Article IX of the United States Constitution states that all rights that are not part of the Constitution are ‘retained by the people’.

184 Ibid. Article X of the United States Constitution states that all residual powers not delegated to the state belong to the people.
Filing a motion to dismiss, the defendant contended that Nemitz had neither appealed to the provisions of the OST nor sought a specific declaration on the viability of his claim on Eros 433.\textsuperscript{185} NASA further asserted that in the absence of an identifiable property interest, no claim may be asserted against NASA for landing on Eros.\textsuperscript{186} Dismissing Nemitz’s claim as ‘arbitrary’, the defendants drew parallels with a person ‘pointing to a distant star and declaring ownership of it’.\textsuperscript{187}

While McKibben J dismissed Nemitz’s complaint for lacking a clearly identifiable ‘legal theory’,\textsuperscript{188} his brief four page judgment failed to address the fundamental issue of whether private non-governmental entities have the ‘legal capacity’ to assert private property rights in Outer Space.\textsuperscript{189} Favouring NASA’s arguments, McKibben J further contended that Nemitz had not only failed to establish a ‘constitutionally protected property interest’ in Eros 433, but also, demonstrated that the Moon Agreement or OST ‘created … rights in Nemitz to appropriate private property rights on asteroids’.\textsuperscript{190} As a space enthusiast and entrepreneur without any substantial legal background,\textsuperscript{191} Nemitz’s claim neither advanced the general principles of property law, including the historical underpinnings of Roman property law\textsuperscript{192} nor substantiated by natural law theorists claiming an immutable right to property.\textsuperscript{193}

\textsuperscript{185} Defendant’s Motion to Dismiss and Memorandum in Support, above n 164.
\textsuperscript{186} Ibid 7, 9–10. NASA argued that the fifth amendment was not established as Nemitz failed to adequately establish a recognised interest in Eros 433. NASA also argued that Nemitz’s claim for compensation under the breach of contract was irrational especially when no legally enforceable contract existed between Nemitz and NASA.
\textsuperscript{187} Ibid 8.
\textsuperscript{188} Nemitz v United States (Nev, No CV-N-03-0599-HDM-RAM, 27 April 2004) 2 (McKibben J).
\textsuperscript{190} Nemitz v United States (Nev, No CV-N-03-0599-HDM-RAM, 27 April 2004) 3 (McKibben J).
\textsuperscript{191} Kelly, above n 189.
\textsuperscript{192} See discussions under heading general principles of law, above. Nemitz failed to provide any advance any argument that his right to property on Eros 433 may exist independent of a sovereign and be ‘recognised’ at a later date as seen in the Louisiana purchase and Arctic Islands.
\textsuperscript{193} Locke, Second Treatise, above n 20, ch 5; Declaration of the Rights of Man art 17.
Apart from claiming a broad brushed ‘inherent right’ to property, Nemitz also failed to appeal to any space law treaty provisions to ‘perfect’ his claim of ownership in Eros 433. In the absence of a detailed judgment considering the ability of private entities to assert private property rights in Outer Space, it is unlikely that Nemitz case may be taken as an authoritative determination against private property rights in Outer Space. As the Nemitz case remains silent on what constitutes a legally valid claim in Outer Space, it remains to be seen whether physical possession of Eros 433 may have rendered a different outcome.

F An Analysis of the Inadequacies in International Law

In the absence of express limitations, private property rights in Outer Space remain plagued by ‘systemic’ non liquet, arising from a void in the existing space law. As the existence of a non liquet remains a highly contentious issue amongst international law scholars, the silence of the law is unlikely to equate to the absence of any law. Rejecting the principle of non liquet as a logical fallacy, Kelsen contends that the ‘residual negative rule’ favours the proposition that in the absence of specific prohibitions imposed by the law, all other residual acts remain lawful. While Lauterpatch favoured a fluid and creative approach to

194 Appellant’s Brief, above n 164, 25.
195 Diederiks-Verschoor and Kopal, above n 164.
197 There is currently no consensus amongst international law scholars on the existence of systemic non liquet. Hans Kelsen, Principles of International Law (The Lawbook Exchange, 1952) 306. Kelsen argues that non liquet, or gaps in the law, are a logical fallacy as acts which are not specifically prohibited remain lawful under the ‘residual negative principle’. See also Neha Jain, ‘General Principles of Law as Gap Fillers’ (Paper presented at the International Legal Theory Colloquium, New York Law School, 27 January 2014) for detailed discussions on systemic non liquet, otherwise known as gaps in the law.
bridge the void in the existing international law, Kelsen adopted a more ‘mechanistic’ approach advancing the ‘residual negative’ principle which proposed that all residual acts remain lawful unless specifically prohibited by the law.

Despite its mounting criticism and scarce application, the ‘residual negative’ principle remains enshrined in the traditions of international law, including the groundbreaking SS Lotus case, which reaffirmed the parties’ ability to act freely in the absence of explicit prohibitions being imposed by the law. This traditional approach is consistent with the views of leading space law scholars who acknowledge the residual ‘freedom principle’. According to Von der Dunk, ‘everything that is not, [in] one way or another, prohibited or conditioned is allowed’ under the Outer Space legal regime.

While the ‘residual negative’ principle may provide a determinative conclusion on the permissibility of private property rights in Outer Space, the disparaging judicial and ambiguity in the existing OST cannot be ignored. As the international space law scholar, Virgiliu Pop, aptly contends that the extraterrestrial property rights regime has fallen prey to its scare legal norms, leaving behind a ‘canabalistic task’ for space lawyers to:

University Press, 1960) 127–59. Stone suggests that the ‘residual negative rule’ may be problematic especially where the ‘norms say nothing at all’. See also M G Markoff, ‘Implementing the Contractual Obligation of Article I of the Outer Space Treaty’ (Paper presented at the 17th Colloquium on the Law of Outer Space, 1974). Markoff opposed the residual negative rule as being regressive. Instead, he proposed that all activities should automatically be prohibited unless permitted by the law.

201 Kelsen, above n 197, 306.
203 SS Lotus (France v Turkey) (Judgment) [1927] PCIJ (ser A) No 10.
204 Ibid.
206 Ibid.
[read] between the lines of public international law norms, their implications on the private spheres, as well as … [analyse] all possible sources of international law.\textsuperscript{208}

Describing the extraterrestrial property rights regime as a ‘downright hostile’ void comparable to the physical vacuum in Outer Space,\textsuperscript{209} space law enthusiasts such as Roberts argue that the existing space law ‘leave[s] gapping holes which must be filled before any serious commercial developments can occur’.\textsuperscript{210} The plethora of ‘imprecise, insufficient and … contradictory rules’ give rise to a multitude of diverse legal interpretations advanced by renowned space publicists.\textsuperscript{211}

\textsuperscript{208} Pop, The Moon, above n 28, 45.
\textsuperscript{210} L D Roberts, S Pace and G H Reynolds, ‘Playing the Commercial Space Game: Time for a New Rule Book?’, \textit{Ad Astra} (United States), June 1996.
\textsuperscript{211} H Nauges, ‘Legal Aspects’ (Paper presented at the 22\textsuperscript{th} Colloquium on the Law of Outer Space, New York, 1979); see also, Pop, The Moon, above n 28, 43. Although publicists do not ordinarily have any role in the creation of new law, Virgulu Pop, suggests that their ‘interpretations’ and ‘clarifications’ remain instrumental in the future developments of the law. Moore, above n 207, 279. Moore cautions academics to carefully consider their interpretations of Space Law as it has the unique ability to influence the positions adopted by states.
III FROM Lunar TO Martian Real Estate: Are Private Entities Capable of Asserting Property Rights in Outer Space?

There is no image, no painting, no visible trait,
which can express the relation that constitutes property ...

It is not material, it is metaphysical; it is a mere conception of the mind.

Jeremy Bentham

Property rights do not form an ‘absolute’ principle, but a variable concept that transitions with time as ‘physical, legal and moral conditions’ develop. Traditional conceptions of property, for example, are illustrated by the Roman Law which mandate three modular characteristics of property including:

(a) the right to use the property (jus utendi);
(b) the right to enjoy the fruits of his or her property (jus fruendi); and
(c) the right to exploit the property, as his or her own, to the extent permitted by the law (abutendi sua quatenus juris ratio patitur).

Modern conceptions, on the other hand, broadened the definition of property to a metaphorical ‘bundle of rights’ consisting of a wide variety of rights such as the right to ‘exclude, transfer, possess and use’ property. This ‘multi-dimensional concept’, when translated to extraterrestrial land

212 Jeremy Bentham, Theory of Legislation (Richard Hildreth trans, Trübner, 1864) 111–3 [trans of Traité de législation civile et pénale (first published 1802)].
215 Sprankling, Understanding Property Law, above n 213, 4–5.
ownership, is as impossible as ‘attempting to catch a school of fish with a hook’.  

Although Article II of the OST prohibits national appropriation, the question remains whether the appropriation of extraterrestrial land by private entities constitutes an act independent of the State. Scholars such as Gray and Crommelin, contend that property ‘is never truly private’, as the State adopts an important role in controlling property by giving it a ‘public law’ like character. By ‘indirectly’ adjudicating on the validity of property claims, the State may be seen as asserting ‘delegated sovereignty’. As Gray fervently contends in his article, Property in Thin Air, private property rights are enforced by the government:

‘Behind the “owner” of “private property” stands the guardian of “public property” and the “commons”; and behind this guardian lie[s] centuries of social thought about the ways in which … [property] should be shared and distributed.

This approach is particularly problematic as the role of the sovereign is often overlooked. Moreover, the role of the State in acknowledging private property rights may vary according to the school of thought adopted by legal scholars moving forward. For example, if the Hobbes utilitarian theory of property is adopted in its raw form, extraterrestrial land may only constitute property if it’s surface is ‘fenced’, ‘secured’ and ‘policed’ by the government. On the other hand, if the Lockean theory of property is

216 Pop, The Moon, above n 28, 62. Pop further contends that property rights is a concept that varies with the physical limits of time, the development of the law and societal changes. See also Gray, above n 213, 295–6.
217 Outer Space Treaty, Art II.
219 M R Cohen, ‘Property and Sovereignty’ (1927) 13 Cornell Law Review 8; see also Gray above n 213.
220 Gray, above n 213.
221 Ibid 303–4.
adopted, property rights may exist on extraterrestrial land, independent of a State’s acknowledgement as:

Everyman has a property in his person. This nobody has a right to but himself. The labour of his body and the work of his hand we may say, are properly his.223

A Mounting Uncertainty in the Existing Literature

![Diagram 1: Private Property Rights in Outer Space](image)

While Article 31 of the Law of Treaties promotes the interpretation of Article II (‘non appropriation principle’) of the OST in ‘good faith’ giving effect to its context, object and purpose,224 three opposing interpretations have emerged in the existing scholarly literature (see Diagram 1). The first school of thought favours a narrow interpretation of Article II of the OST suggesting that private property rights which are not expressly excluded in the OST, may be recognised by the State.225 Proponents of the second school of thought advocate for the interpretation of the ‘non-appropriation’ principle as an all-inclusive provision prohibiting any form of appropriation in Outer Space.226 Scholars subscribing to the third school of thought suggest that while private appropriation remains plausible under Article II of the OST,227 it may never be converted into a legally enforceable right to property in Outer Space.

223 Locke, Second Treatise, above n 20, ch 5 [27].
225 Wasser and Jobes, above n 62.
226 Thomas Gangale, above n 62.
227 Outer Space Treaty art II.
B Yes, Private Property Rights are Permitted

1 All Forms of Private Appropriation Permissible

Favouring a narrow interpretation of Article II of the OST, legal academics such as Wayne White, contended that the ‘national non-appropriation’ principle must not be mistaken for an ‘all-inclusive’ provision that prevents private entities from asserting property rights on Outer Space. To further justify his assertion, White, heavily relied on the COPUOS draft resolutions, which called for a broader clause than the ‘national non-appropriation’ phrase eventually adopted in Article II of the OST. Although the International Institute of Space Law’s (IISL) proposal recognised a key distinction between ‘national appropriation’ and ‘private appropriation’ and suggested the use of the phrase, ‘celestial bodies … shall not be subject to national or private appropriation’, the drafters’ reluctance to insert the word ‘private appropriation’ may be viewed as a deliberate attempt to allow private property rights in Outer Space.

While a majority of legal academics fervently oppose this ‘loophole’ theory, few space law academics and enthusiasts, such as Wasser and Gorove, contend that the OST contains no express provision against ‘individual appropriation’. In his paper presented at the 11th Colloquium

228 Outer Space Treaty art II.
229 White, Real Property Rights, above n 10; see also Wasser and Jobes, above n 62, 31–3.
231 International Institute of Space Law, Legal Status of Celestial Bodies, above n 230.
232 Pop, The Moon, above n 28, 63. Pop strongly disapproved the narrow interpretation of Article II of the OST which presumably allowed private entities to ‘appropriate’ extraterrestrial land. He further claimed that the ‘loophole theory seems to have been swallowed by a part of the press, charmed by the impression that Hope has outsmarted the UN’.
on the Law of Outer Space, Gorove further supports his argument by proposing that:

[A]n individual acting on his own behalf or on behalf of another individual or a private association or an international organisation could lawfully appropriate any part of outer space, including the moon and other celestial bodies.\(^{234}\)

Equating ‘national appropriation’ with ‘sovereignty’, Gorove further advocates that even private property rights asserted by individuals establishing a permanent settlement in Outer Space, falls short of ‘national appropriation’ unless it constitutes a State activity conducted under the pretext of ‘individual appropriation’ or an act of ‘private appropriation’ conducted under the ‘supreme authority’ of the State.\(^{235}\) Nevertheless, some space law advocates such as Reynolds and Kopel go further by suggesting that even the government’s act of recognising and ‘defending’ its settler’s future claims on Martian land does not amount to ‘national appropriation’, precluded by Article II of the OST.\(^{236}\)

Appealing to Locke’s ‘labour theory’ and the civil traditions of property law, Wasser and Jobes contend that private property rights need not derive from the sovereign, as commonly illustrated in the Common Law traditions of property law.\(^{237}\) Unlike the Common Law’s ‘feudal’ origins of property which assert that all private property traces back to the Crown, the Civil law

against private entities asserting property rights in Outer Space. Appealing to the principle of *expressio unius est exclusio alterius*, which means that the expression of one proposition excludes another, Alan Wasser and Douglas Jobes, suggest that the insertion of the term ‘national appropriation’ without any reference to ‘private appropriation’ proposes a ‘deliberate’ exclusion of the latter. See also Crawford, above n 82 for a detailed discussion on the *expressio unius est exclusio alterius* maxim.


\(^{235}\) S Gorove, Interpreting Article II, above n 64, 351.


\(^{237}\) Wasser and Jobes, above n 62, 48–50.
system stemming from the ‘Roman law’, suggests that property rights may exist independent of the sovereign.\textsuperscript{238} As all forms of ‘sovereignty’ are excluded on extraterrestrial bodies, the common law notions of property may not apply to Outer Space.\textsuperscript{239} Pursuant to the ‘natural law’ principle of \textit{pedis possessio},\textsuperscript{240} which refers to taking ‘actual’ possession of land by its ‘use and occupation’, private entities who ‘mix their labour with the soil … [may] create property rights independent of the government’.\textsuperscript{241} As John Locke highlighted in his seminal work, The Two Treatises of Government, an individual may be entitled to as much property as a ‘man Tills, Plants, Improves, Cultivates and …, use[s]’.\textsuperscript{242} When translated to Outer Space, Wasser and Jobes’ interpretations of the OST suggest a limited set of property rights requiring private entities or space settlers to only appropriate extraterrestrial land which they ‘use’, ‘occupy’ or ‘enhance’ in Outer Space.\textsuperscript{243}

It remains difficult to define the ‘use’ and ‘occupation’ of Outer Space as space exploration remains in its infancy stages. As space companies such as SpaceDev\textsuperscript{244} and Galactic Mining\textsuperscript{245} result to robotic probes to ‘remotely’ establish property rights on extraterrestrial land, it remains difficult to comprehend whether these acts will satisfy the natural law principle of \textit{pedis possessio}. Even if the primary hurdle imposed by the Lockean labour theory of property is overcome by appealing to the Czech origins of the term \textit{robata}, implying ‘forced labour’,\textsuperscript{246} and Roman law conceptions of property

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{238} Ibid 48–9; see Gilson, above n 28, 1375–7 for a detailed comparison between the Civil law and the Common law traditions of property.
\item \textsuperscript{239} Wasser and Jobes, above n 62, 49.
\item \textsuperscript{240} Braum Garner, \textit{Blacks Law Dictionary} (West Publishing, 8\textsuperscript{th} ed, 2004). \textit{Pedis Possessio} is defined as a ‘foothold; an actual possession of real property implying either actual occupancy or enclosure or use’.
\item \textsuperscript{241} Wasser and Jobes, above n 62, 49.
\item \textsuperscript{242} Locke, Second Treatise, above n 20, ch 5 [32].
\item \textsuperscript{243} Wasser and Jobes, above n 62, 56–8.
\item \textsuperscript{244} M Dixon, ‘Promise me the Moon: Property Rights in Outer Space’, \textit{Accountancy}, 1998, 29. Jim Benson, for example, proposed planting SpaceDev’s flag on Asteroid 4660, Nerus with a robotic probe to claim property in the asteroid. Unfortunately, his proposal never materialised due to a lack of funding.
\item \textsuperscript{245} Pop, The Moon, above n 28, 114–5. Using Gemma and Neutron spectroscopy to examine Asteroid 2004, GU9, Galactic Mining Industries sought to assert a ‘telepresence’ on the asteroid claiming its ownership.
\item \textsuperscript{246} Angus Stevenson (ed), \textit{Oxford Dictionary of English} (Oxford University Press, 2010) 1537.
\end{itemize}
\end{footnotesize}
which allows slaves, otherwise regarded as ‘chattel’, to appropriate land for its master,\textsuperscript{247} it remains difficult to determine the true scale of property rights that may be permissible in Outer Space.\textsuperscript{248}

2 \textit{Functional Property Rights}

Drawing on the earlier works of Jenks, a prominent international lawyer and space law scholar, real property may only be asserted within a facility, such as a ‘space station’, attached to the surface of an extraterrestrial body.\textsuperscript{249} Any discussion about real property rights beyond a ‘facility’ is not determined by the laws governing the use of Outer Space but rather a ‘question of policy’ which calls for the ‘authorisation’ or ‘recognition’ of private property rights.\textsuperscript{250} Although White fervently opposed Jenk’s treatment of real property rights,\textsuperscript{251} he nevertheless contended that a functional property rights regime may be highly desirable for the appropriation of Outer Space.\textsuperscript{252}

As Article VIII of the OST, allows ‘ownership’ of objects attached to the surface of a celestial body and maintenance of a ‘registry’ of objects

\textsuperscript{247} H J Roby, \textit{Roman Private Law in the Times of Cicero and of the Antonines} (Cambridge University Press, 1902) vol 1, 432, 452–3; Pop, The Moon, above n 28, 112–3. According to the principles of Roman law, property rights need not only be asserted a ‘legal person’, but ‘slaves’ acting under the control of its master. Although ‘slaves’ were incapable of asserting any form of ‘ownership’ in property, it was widely recognised that the property they sought to acquire automatically amounted to a claim by its master. Using the Roman notions of property law as precedent, it may be contended that these robotic probes are able to claim extraterrestrial land for its master. By extrapolating its master’s ‘intention’ to acquire property (\textit{animus}) and acting upon it (\textit{corpus}), these robots may gain ‘actual possession’ of the extraterrestrial terrain for its ‘owner’, private corporations and humans alike.

\textsuperscript{248} Cf Scripps Howard News Service, ‘Own Your Piece of the Rock’, \textit{San Francisco Examiner} (San Francisco) 21 February 1998. Reynolds proposes a ‘reasonability’ test which restricts property claims to areas explored by the robotic probe, rather than, the entire surface of the celestial body.

\textsuperscript{249} Jenks, above n 230, 297.

\textsuperscript{250} Ibid.

\textsuperscript{251} White, \textit{Real Property Rights}, above n 10.

\textsuperscript{252} Ibid. According to White, private property rights in Outer Space should not be conveniently categorised as a matter of political discourse:

\textit{Why would [the] recognition of property rights outside a facility ‘raise a major question of policy’ while property rights within a facility would not?}
launched into Outer Space,\textsuperscript{253} title would arise from the ‘control’ of facilities or objects attached to the extraterrestrial surface.\textsuperscript{254} While functional property rights do not deal with the traditional notions of property which passes through a title which claims ownership of land, it in practice is strikingly similar to private property rights asserted on Earth.\textsuperscript{255} The right to ‘use’ this extraterrestrial land and its resources would derive on a ‘first come, first served basis’ allowing private entities to occupy a reasonable area surrounding its ‘facility’ until it is no longer in operation or is returned to Earth.\textsuperscript{256} Simply put, private entities parking a space station on an extraterrestrial surface, may be allowed to ‘use’, ‘occupy’ and ‘enjoy’ the land and its resources without having the need to establish any form of ‘ownership’.\textsuperscript{257}

\textbf{C No, Private Property Rights are Prohibited}

Proponents of the second school of thought rely on a stronger, \textit{fortiori} argument to expressly forbid private property rights in Outer Space.\textsuperscript{258} Supported by a multitude of distinct legal reasons, ranging from ‘teleological’ to ‘systemic’ interpretations of the OST,\textsuperscript{259} the vast majority of space law academics contend that:

\begin{itemize}
  \item[(a)] Article II of the OST should be broadly construed as an ‘all-inclusive’ provision preventing both private and national claims of property in Outer Space;\textsuperscript{260}
\end{itemize}

\textsuperscript{253} \textit{Outer Space Treaty} art VIII states that any object launched into Outer Space remains the property of its owner, even if it is attached to the extraterrestrial surface:

\begin{quote}
A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the Earth.
\end{quote}

\textsuperscript{254} White, Real Property Rights, above n 10.
\textsuperscript{255} Ibid.
\textsuperscript{256} Ibid.
\textsuperscript{257} Ibid.
\textsuperscript{258} Gangale, above n 62; D J O’Donnell and N Goldman, ‘Astro law as lex communis spatialis’ (Paper presented at the 40\textsuperscript{th} Colloquium on the Law of Outer Space, Turin, Italy, 7 October 1997) 322; Tennen, Emerging Systems, above n 67.
\textsuperscript{259} Pop, The Moon, above n 28, 64.
(b) All acts of ‘private appropriation’ in Outer Space automatically amount to an act of ‘national appropriation’ as private property rights remain intrinsically intertwined with notions of sovereignty and cannot come into existence without the State; and

(c) Private property rights, in itself, implies some form of ‘exclusivity’ which diametrically opposes the ‘objective’ of the OST promoting ‘free access to all areas of celestial bodies’. Nevertheless, the prohibition of private property rights in Outer Space may appear ‘restrictive’, undermining future commercial exploitation of Outer Space.

1 An All-Inclusive Phrase Prohibiting Private Appropriation

The historical developments of Article II of the OST suggest that the ‘national non-appropriation’ principle forms an all-inclusive provision prohibiting private property rights in Outer Space. As noted by the Belgium Delegate, the phrase ‘national appropriation’ not only precluded the assertion of ‘sovereignty’ in Outer Space but also ‘the creation of titles to property in private law’. Analysing the practical application of property rights under the civil law traditions of property, the Belgian delegate further asserted that even private property rights were premised upon a ‘public law’ framework which required the State to assert some form of sovereignty when ‘administering’ property in Outer Space. Similarly, the prohibition of private appropriation formed one of three basic principles

261 Lauterpacht, Oppenheim’s International Law, above n 130, 555; Gangale, above n 62, 34–9.
262 Pop, The Moon, above n 28, 65; see also Outer Space Treaty art I.
264 Gangale, above n 62, 35; Pop, Who Owns the Moon, above n 28, 64.
266 Ibid.
of the OST. Following this line of argument, the insertion of the phrase ‘private appropriation’ may appear superfluous, as it already fell under a known subset of the ‘national non-appropriation’ principle.

The widespread prohibition of ‘private appropriation’ in Outer Space resonates with key documents, which came into effect prior to the enactment of the OST. As Article II was seamlessly integrated into the OST without significant debate, the draft resolutions provide valuable insight into the consensus prior to the commencement of negotiations of the OST. Although Article II of the OST is not identical to the draft resolutions adopted by the New York Bar Association (NYBA) and the Institute of International Law (IIL), it is not substantially different from the broad and all-inclusive phrase, that celestial bodies are ‘not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means’, inserted at the end of Article II of the OST. Prima facie, the provision is remarkably similar to an earlier resolution adopted by the International Law Association (ILA) which proposed that ‘States would not make claims to sovereignty or other exclusive rights over celestial

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268 P Dembling, ‘Negotiating Issues in Forming the 1967 Treaty on Outer Space’ (Paper presented at the 40th Colloquium on the Law of Outer Space, 1997) 34, 39; E Brooks, ‘Control and Use of Planetary Resources’ (Paper presented at the 11th Colloquium on the Law of Outer Space, 1968) 339, 344. Although space law scholar, Brooks, noted that the ‘contracting parties did not wish to foreclose future positions by … precisely [defining] the rights … [associated with the use of] celestial bodies’, the scope of Article II of the OST may be regarded as ‘settled’ by the contracting parties, especially in the absence of any subsequent declarations expounding on its definition.
269 Pop, The Moon, above n 28, 64. In 1960 the New York Bar Association drafted a recommendation which opposed the ‘exclusive appropriation [of celestial bodies] by any person, organisation … on the Earth’. Similarly, the 1966 draft working paper of the IISL proposed that ‘celestial bodies … shall not be subject to national appropriation or private appropriation’.
270 The resolution adopted by the Institute of International Law, in the 1963 Brussels Conference, expressly stated that all ‘celestial bodies … [were] not subject to any kind of appropriation’.
271 Gangale, above n 62, 36; cf White, Real Property Rights, above n 10. According to White, the absence of the term ‘private appropriation’, in Article II of the Outer Space Treaty, resonates with the drafters’ deliberate attempt to only prohibit ‘national appropriation’ and not ‘private appropriation in Outer Space. See also Tennen, Emerging Systems, above n 67. Tennen explicitly highlights that:

The Outer Space Treaty did not create a dichotomy … between governmental and non-governmental activities in space, but rather established the basic principles upon which all space activities, public and private, are to be conducted.
bodies’.\textsuperscript{272} As private property rights on Earth, call for some form of ‘exclusivity’,\textsuperscript{273} it may be argued that private appropriation automatically amounts to the assertion of ‘exclusive rights’ on extraterrestrial bodies and therefore is, prohibited on extraterrestrial bodies.\textsuperscript{274} Nevertheless, a detailed examination of Article II of the OST and the draft resolutions, suggests a more restrictive meaning of the phrase, ‘by any other means’ as nothing more than the prohibition of ‘national appropriation’\textsuperscript{275} and the ‘States [assertion of] … exclusive rights’,\textsuperscript{276} respectively.

2 Indistinguishable from Sovereign Appropriation

As the actions of private actors remain regulated by the State, it may be argued that private property rights are derived through the State.\textsuperscript{277} Entrusted with the power to authorise private activities in Outer Space, the State cannot ‘engage in conduct which is prohibited by positive international law to the State itself’.\textsuperscript{278} To recognise private property rights on extraterrestrial bodies, would not only be ‘illogical’ but undermine the very foundation of international law by offering States the opportunity to engage in otherwise restricted activities under the ‘convenient subterfuge of … of the private’.\textsuperscript{279}

\textsuperscript{272} The International Law Association, in the 1960 Hamburg Conference, adopted a resolution prohibited claims of territorial sovereignty in Outer Space.
\textsuperscript{273} Sprankling, Understanding Property Law, above n 213, 4–5.
\textsuperscript{274} Gangale, above n 62, 36.
\textsuperscript{275} Outer Space Treaty art II.
\textsuperscript{276} Pursuant to the 1960 Hamburg Conference, states are prohibited from asserting ‘sovereignty or other exclusive rights over celestial bodies’. See also Gangale, above n 62, 36.
\textsuperscript{277} Lawrence A Cooper, ‘Encouraging Space Exploration Through a New Application of Space Property Rights’ (2003) 19 Space Policy 111.
\textsuperscript{278} Tennen, Emerging Systems, above n 67; see also Gangale, above n 62, 36–8; Jenks, above n 230, 201. Expounding on the state’s responsibility for national activities, Jenks suggests that the Outer Space Treaty does not only prohibit the creation of a private corporation by the State, but also, private property rights asserted by ‘its nationals acting as a private adventurer’. See also, P M Sterns, G H Stine and L I Tennen, ‘Preliminary Jurisprudential Observations Concerning Property Rights on the Moon and Other Celestial Bodies in the Commercial Space Age’ (Paper presented at the 39th Colloquium on the Law of Outer Space, 1996) 50, 53. Sterns proclaims that property which cannot be ‘publicly’ appropriated, is not capable of any form of private appropriation.
\textsuperscript{279} Tennen, Emerging Systems, above n 67.
From Christopher Columbus’ discovery of America\(^{280}\) to James Cook’s quest for the Hawaiian Islands,\(^{281}\) most claims for unoccupied land were historically acquired on behalf of or for the sovereign.\(^{282}\) This approach was consistent with Lauterpatch’s assertion that any uninhabited territory can only be exclusively occupied ‘by and for a State … it must be performed in the service of a State, or … acknowledged by a State after its performance’.\(^{283}\) Without being entrusted with a public power to ‘acquire’ and ‘administer’ property, private entities seeking to appropriate unoccupied masses of land may find themselves acting outside the ‘Law of Nations’.

Even if private entities were successful in claiming these unowned territories, any ‘recognition’ of private property rights in Outer Space mandates either the establishment of a ‘new’ sovereign State, with the necessary public powers to acknowledge a claim, or an ‘existing’ sovereign State proclaiming that the property had been acquired on behalf of the State.\(^{285}\)

Assuming momentarily that private property rights are permitted in Outer Space, the application of the ‘eminent domain’ principle, renders the rigid distinction between a wholly private and public property as absurd. As Grotius expounds in his seminal work *De Jure Belli et Pacis*, the ownership of property may transition from a private entity to the State as ‘[t]he property of subjects is under the eminent domain of the State … [to] use and even alienate and destroy such property’.\(^{286}\) Hypothetically if the principle of ‘eminent domain’ is extended to the Lunar Embassy, a successful advocate of Lunar land since the 1980s having sold more than 560 million

\(^{280}\) Christopher Columbus and Bartolomé de Las Casas, *The Diario of Christopher Columbus’s First Voyage to America 1492-1493* (University of Oklahoma Press, 1991) vol 70, 4; Georg Forster, Nicholas Thomas and Oliver Berghof, *A Voyage Round the World* (University of Hawaii Press, 2000) vol 1, 5.

\(^{281}\) Georg, above n 281, 7–9.


\(^{283}\) Lauterpacht, Oppenheim’s International Law, above n 130, 555.

\(^{284}\) Ibid 554–5.

\(^{285}\) Ibid.

acres of the Moon, forwards a *reductio ad absurdum* argument that the acres on the Moon claimed by its founder, Denis Hope, are capable of being converted into property owned by the USA government. This absurd transition of private property from a USA national to the USA, in itself, represents a logical fallacy.

While the amalgamation of private property rights with ‘sovereignty’ appears promising at first glance, it remains riddled with practical complexities. As the OST prohibits States from asserting any form of sovereignty in Outer Space, it may appear theoretically impossible for the State to ‘authorise’ or ‘control’ the actions of ‘their’ nationals, especially if they were to assume a new identity as ‘Martian’ or ‘Lunar’ inhabitants under a newly established extraterrestrial sovereign, which is not a party to the OST. Until the ‘national non-appropriation’ principle develops into a recognised norm of international law, it remains unlikely that these extraterrestrial sovereigns, will be subject to these Earthly restrictions. Simply put, immigrants assuming a new identity under a novel ‘Martian’ or ‘Lunar’ sovereign may not be prohibited from asserting private property rights on Mars and the Moon, respectively.

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289  Ibid.
290  *Outer Space Treaty* art II.
291  Bogotá Declaration, above n 84; Andrej Gorbis, ‘The Legal Status of Geostationary Orbit: Some Remarks’ (1978) 6 *Journal of Space Law* 171. The international community rejected the claims of a group of equatorial countries seeking to extend their claims of sovereignty to the geostationary orbit in Outer Space.
   (a) the participation of states in Outer Space activities;
   (b) its ability to deal with specific activities in Outer Space; and
   (c) its tendency to reflect the ‘actual practice’ of States.
   Although many states have signed the Outer Space Treaty, its recognition as a norm is problematic for three reasons. First, few states have the ‘actual’ ability to engage in activities in Outer Space. Second, the Outer Space Treaty imposes ‘general and broad legal obligations’ failing to deal with specific activities such as the assertion of private property rights in Outer Space. Third, the Outer Space Treaty offers to regulate activities in Outer Space even before it is reflected in the ‘actual practice’ of the States.
Nevertheless, the historical analogies which presuppose that private entities can only claim previously unowned territories for the benefit of the State, raises yet another reductio ad absurdum, or absurd, argument. If this intrinsic link between property and sovereignty is applied to Outer Space, it is likely to draw an important distinction between ‘nationals’, individuals, who fall under the control of a particular State, and a ‘stateless’ individual who is ‘not regarded as a national by any State under the operation of its law’. While private entities belonging to the former group may be prohibited from appropriating extraterrestrial bodies, the acts of ‘stateless’ individuals is unlikely to amount to an act of the State. In other words, private property rights asserted by a ‘stateless’ entity is unlikely to contradict the national ‘non-appropriation’ principle found in Article II of the OST. Although some national laws restricts its nationals’ ability to ‘voluntarily’ renounce their citizenship, this nevertheless remains a viable loophole that future Outer Space explorers and or inhabitants may rely on to assert private property rights on extraterrestrial bodies.

293 Columbus and de Las Casas, above n 281; Georg, above n 281, 7–9.
296 Ibid.
297 Government of UK, Give Up (Renounce) British Citizenship or Nationality (2015). Cf United States Department of State, Renunciation of US National (2015); Immigration and Nationality Act, 8 USC § 349 (1952). The United States of America allows its nationals to voluntarily renounce their citizenship without assuming a new nationality, even if it renders the individual stateless.
Contrary to the Free Access Provision in the OST

Adopting a systematic analysis of Article I of the OST, leading space law scholars such as Gangale and Pop suggest that private property rights contradict the ‘free access’ provision stipulated in the OST. Although Article I promotes ‘free access to all areas of celestial bodies’, it must not be read as a prescriptive provision imposing a positive obligation, but rather, a general overarching principle of the OST. Nevertheless, these in rem rights in extraterrestrial property assumes, not only some form of ‘exclusivity’, but also, the ability to exclude third parties from ‘accessing’ or ‘trespassing’ upon their property. Appealing to the principles of deductive reasoning, it may be further contended that private property rights prevent extraterrestrial property from falling under the control of a single individual or a group of private entities. Moreover, any property rights asserted in Outer Space, may be inconsistent with the primary objectives of the OST which implies that the Moon and other extraterrestrial bodies remain ‘at the equal disposal of all men’, as a global common, and ‘non-appropriable by individual States or private persons’.

While the ‘free access’ provision may prevent private entities from appropriating extraterrestrial land, the ‘free exploration and use’ principle, found in the same article, may often be used to justify the deliberate appropriation of resources found on the surface and subsurface of extraterrestrial bodies. As Gangale contended in his seminal work, The Development of Outer Space, the assertion of private property rights remains unnecessary in Outer Space as Article I of the OST already allows for a limited set of property rights in the natural resources found on the

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298 Gangale, above n 62, 38.
300 Gangale, above n 62, 38; Pop, The Moon, above n 28, 65; Dalton, above n 260, 15–6.
301 Outer Space Treaty art 1.
302 Gangale, above n 62, 38.
304 Ibid.
Moon and other celestial bodies, unlike the free ‘access’ principle, the free ‘use’ principle, interpreted in a Lockean manner, permits a limited form of ownership in property by infusing labour into the extraction of these resources. While far-reaching claims for extensive masses of resources and land are likely to be prohibited by Article I of the OST, a private entity’s use of a limited amount of land and resources is necessary for its continued ‘operation’ or ‘utilisation’ to be permissible.

Drawing parallels to the deep seas, Gangale further asserts that the extraction of resources from extraterrestrial bodies may be likened to the removal of fishes from the deep seas. As the deep sea is often categorised as res communis or communal property, the fishes in the deep sea remain the common property of all of mankind until it is subsequently removed with fishermans’ efforts. Impelled by a similar notion, the resources extracted from the surface and subsurface of these extraterrestrial bodies transition from ‘communal’ property to ‘private’ property belonging to the individual. Unfortunately, Article I of the OST represents nothing more than an idealistic provision promoting the freedom to ‘access’ and ‘explore’ all celestial bodies. These broad overarching ‘free access’ provisions, asserted in general terms in the OST, should not be mistaken for a restrictive provision. By its very notion, the principles of ‘freedom’ and ‘restriction’ remain diametrically opposite.

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306 Gangale, above n 62, 39–44.  
307 Ibid.  
308 Ibid 42.  
309 Ibid.  
310 Ibid.
Unconcerned with the ability of private entities to appropriate extraterrestrial bodies, per se, proponents of the third school of thought widely challenge the ‘legal’ validity of private property rights asserted in Outer Space in the absence of a recognising sovereign. Relying heavily on Hobbes theory of property, they fervently advance the argument that private property rights cannot exist ‘naturally’ without being policed by a recognized State. Unlike the Lockean notion of property, Hobbes’ theory, presupposes that private property rights cannot exist in a vacuum, prior to the existence of the State. Without the requisite societal acceptance or acknowledgement by an overarching ‘superior authority’, private claims on extraterrestrial land may be reduced from the status of ‘ownership’ to mere ‘possession’.

1 Territorial Sovereignty

Although the OST remains silent on the issue of private property rights, it expressly ‘undercuts the [State’s] ability … to recognise or enforce a private claim’. As the national non-appropriation principle prohibits the assertion of ‘any form’ of sovereignty on extraterrestrial bodies, any ‘recognition’ of private property rights by a State may contravene this provision. Hence, the acts of seeking to ‘enforce’, ‘recognise’ or ‘protect’ ‘territorial acquisitions’ of its nationals intrinsically amount to an act of ‘national appropriation’, prohibited under Article II of the OST.

311 Pop, The Moon, above n 28, 66.
313 Ibid.
314 Pop, The Moon, above n 28, 66. Pop contends that it remains impossible for private property rights to exist in isolation, ‘outside the sphere of State protection’.
315 Silber, above n 209; see also, Pop, The Moon, above n 28, 66–9.
316 Silber, above n 209. According to Silber, the prohibition of ‘national sovereignty’ in the Outer Space Treaty automatically undermines the State’s ability to ‘recognise’ or ‘enforce’ private property rights.
317 Pop, The Moon, above n 28, 68.
While proponents of this school of thought generally contend that the conferral of private property rights by the State in Outer Space is likely to contravene the OST, Pop in his seminal work, *Who Owns the Moon*, especially suggests that even a lesser and more subtle act of ‘administering’ private property claims in Outer Space may be likened to the materialisation of State sovereignty. Relying heavily on the *Minquiers and Echros* case, which recognised the United Kingdom’s (UK) sovereignty over the Minquiers rocks and islets by recognising contracts for the sale of real property and maintaining a public registry of privately owned property, he further contended that States, ‘recognising’ private property rights in Outer Space, would automatically assume a similar role of ‘sovereign’. Hence all ‘administrative’ acts of the State, such as maintaining a public registry of extraterrestrial property claims, is likely to amount to an act of sovereignty, expressly prohibited by Article II of the OST.

Nevertheless, a detailed examination of Pop’s arguments reveals two fundamental flaws. First, private property rights recognised by the State do not automatically amount to a claim to sovereignty on the extraterrestrial body. Secondly, as discussed in the *Greenland* case, territorial sovereignty requires two elements:

(a) an act exercising sovereign control; and

(b) the requisite ‘intention’ and desire to assert sovereignty.

Even if the State satisfies the first element by assuming the role of a ‘public administrator’ in Outer Space, it remains highly unlikely to amount to an act of sovereignty, especially in the absence of the requisite ‘sovereign’ intention. Simply put, the mere recognition of private property rights on an extraterrestrial body does not amount to an act of sovereignty, without the

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318 Ibid. See also *Island of Palmas (Netherlands v United States) (Decision)* (1928) 2 RIAA 829. As illustrated in the *Island of Palmas* case, ‘actual sovereignty’ is unlikely to be superimposed on a territory in the absence of ‘any acts of public administration’.  
319 Ibid 65.  
320 *Pop, The Moon*, above n 28, 68.  
321 Ibid.  
322 Ibid 45–6.
express ‘intention’ of the State to establish territorial sovereignty in Outer Space, through the claims of private entities. As aptly summarised in the *Greenland* case, ‘a claim to sovereignty is not based … upon some particular act or title … but the continued display of authority by a single State’. Extraterrestrial land, unlike the *terra nullius* examples found on Earth, does not sit on the boundary of any State or group of States. Hence, the mere ‘recognition’ of extraterrestrial private property rights, especially when carried out by a multitude of States, is unlikely to amount to a claim of sovereignty on the extraterrestrial body. Even an enabling ‘act’ or a public registry of extraterrestrial deeds, without more, remains consistent with the limited State ‘authorisation’ powers provided in Article VI of the OST and is unlikely to contradict the ‘national non-appropriation’ principle.

The second, albeit stronger reason, for recognising private property rights in Outer Space is that the physical ‘possession’ of land ‘hardly extend[s] to every portion of territory’. Pursuant to the *Island of Palmas* case, sovereignty mandates a ‘continuous … manifestation which must make itself felt through the whole territory’. Though manifestly chaotic, it remains theoretically possible for States to recognise private property rights in Outer Space without any given State or group of States asserting territorial sovereignty over the extraterrestrial body. Moreover, as private entities only appropriate reasonably sized parcels of extraterrestrial land for their ‘use’ and ‘enjoyment’, it is unlikely that the recognition by any State or group of States amount to ‘sovereignty’ which is asserted through the entire Lunar or Martian territory (see Figure 3). As the property passes from the hands of one private entity to another, with the sale of extraterrestrial

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325 Ibid 45.
326 Bogotá Declaration, above n 84.
327 See especially *Outer Space Treaty* art II. Article II of the Outer Space Treaty expressly prohibits States from asserting any claims of sovereignty on the Moon and Other Celestial bodies.
328 *Outer Space Treaty* art VI.
329 Ibid art II.
330 *Island of Palmas* (1928) 2 RIAA 829, 855.
331 Ibid 829.
332 Ibid 855.
land, any claims of perpetual sovereignty in the territory may become impossible (see Figure 4).  

See, eg., 107 Congressional Record H691 (Chris Hansen) (2002, House of Representatives); see also Louisiana Purchase Treaty, United States of America–French Republic, signed 4 July 1803 (effective 1 October 1804). The Louisiana Purchase offers a promising analogy for private property rights in Outer Space. Pursuant to the Louisiana Purchase, all private property rights within the Louisiana Territory was subsequently ‘recognised’ by the United States of America, which purchased the residual territory from the French government. All ‘archives, papers and documents were transferred to the possession of the United States of America. The seamless ‘recognition’ of private property rights from the ‘vendor’ State to the ‘purchasing’ State marks a groundbreaking legal precedent that private property rights may transition from the ‘recognition’ of one State to another with great ease. When translated to Outer Space, the Louisiana Purchase permits private entities to freely sell and purchase extraterrestrial land, without any claims of perpetual sovereignty, as the extraterrestrial property transfers from the ‘recognition’ of one State to another.”
Figure 4: Transitionary Nature of Land Ownership
Evaluating the Competing Positions

Prima facie, as the laws governing private property rights in Outer Space remain riddled with ambiguity, proponents of the third school of thought advance the most accurate reflection of the existing private property rights regime by contending that private property rights, though plausible, may not be legally recognised. Although at a cursory glance, the judiciaries’ repeated failure to recognise private property claims in the Nemitz334 and Langevin335 case may lend validity to this position, a detailed examination reveals that the court’s failure to ‘recognise’ private property rights in Outer Space must not be mistaken for an express refusal to recognise private property claims in the future. Moreover, it remains premature to suggest that private property rights may not be legally recognisable in the future, given that the existing claims of private property rights are based on ‘identifying’ and ‘claiming’ vast masses of extraterrestrial land in its entirety without first taking physical possession of its surface.

Similarly, the outlandish proposals advanced by the majority of Space Law scholars, calling for the prohibition of private appropriation in Outer Space, remains fundamentally flawed. The ‘national non-appropriation’ principle must not be mistakenly construed as a broad all-inclusive phrase prohibiting private entities from asserting property rights in Outer Space. Even at its most fundamental level, proponents of this school of thought do not only fail to balance the interests of private non-governmental entities and mankind as a whole, but also, runs contrary to the ‘freedom’ principle which promotes the free use and exploration of Outer Space.336 From a pragmatic front, the complete prohibition of private property rights leads to absurd results as private entities may not be entitled to property which they acquire by expending significant resources such as their labour, expertise and finances. From a legal perspective, the complete prohibition of private

334 Nemitz v United States (Nev, No CV-N-03-0599-HDM-RAM, 27 April 2004).
335 Re Langevin [2012] QCCS 613 (Superior Court of Québec).
336 See Locke, Second Treatise, above n 20, ch 5 [37]. Although the earth was given to men in common, he can only truly ‘use’ property to his benefit if he is able to claim property for himself to the exclusion of others.
property rights remains unprecedented even in the existing legal regimes governing terrestrial territories on Earth, especially in the deep seas and Antarctica, which remain remarkably similar to Outer Space.\(^{337}\)

While the permissive approach best illustrates the future use and exploitation of extraterrestrial bodies, it may be criticised for its narrow interpretation of Article II of the OST and failure to adhere to the ‘common heritage of mankind’ principle. A distinction must be drawn between the space law scholars, such as Wasser and Jobes, who advocate for all forms of private property rights in Outer Space\(^{338}\) and other legal academics, such as White, call for a limited ‘functional’ property rights regime in Outer Space.\(^{339}\) While the former approach would validate prospective claims of entire masses of land or planets in Outer Space,\(^{340}\) the latter would more accurately justify private property claims over reasonably sized plots of extraterrestrial land based on its ‘actual’ use.\(^{341}\)

Nevertheless, the jarring void in the existing laws, or *de lege lata*, calls for a critical re-evaluation of the three positions advanced by space law scholars by drawing upon terrestrial examples for clarification. While the development of future treaties and laws governing private property rights in Outer Space remains a matter of political discourse, legal precedents found in the deep seas and Antarctica may provide much needed certainty for private entities, especially large corporate conglomerates, who share both the means and ability to advance into Outer Space in the near future.\(^{342}\) Without a viable property rights regime to back their investments in Outer

\(^{337}\) Dalton, above n 261.

\(^{338}\) Wasser and Jobes, above n 62.

\(^{339}\) White, Real Property Rights, above n 10.

\(^{340}\) Wasser and Jobes, above n 62.

\(^{341}\) White, Real Property Rights, above n 10.

Space, private explorations and operations are likely to come to a revolting halt.\textsuperscript{343}

\textsuperscript{343} Roberts, Pace and Reynolds, above n 210. Roberts, Pace and Reynolds assert that the commercialisation of extraterrestrial resources would be unattainable without a ‘cohesive system of property allocation and rights’. See also Ferrer, above n 41. According to Ferrer, the lack of a viable private property rights regime, ‘paralyses’ private activities in Outer Space.
IV TERRESTRIAL PROPERTY RIGHTS: LESSONS FROM ANTARCTICA, THE DEEP SEABED AND THE ARCTIC

[W]hen the slave says:

the sea is certainly common to all persons – the fisherman agrees –
then what is found in the common is common property, he rightly objects,
saying:

- But what my net and hooks have taken, is absolutely my own

Hugo Grotius 1608

As the extraterrestrial bodies, like the deep sea and Antarctica, are commonly regarded as territory that falls outside the sovereignty of any one State, it is often relied upon by renowned legal scholars to resolve the virtually non-existent private property rights regime in Outer Space. In addition to their legal similarities in these res communis territories, both Antarctica and the deep seabed share a remarkable resemblance with Outer Space territories which serve as:

(a) resource rich bodies which may only be exploited by significant technical expertise and funding; and

(b) subjected to limited, if not, non-existent claims of sovereignty.

Although these terrestrial legal regimes shed some valuable insight on the future developments of the property rights in Outer Space, a simple ‘cut’ and ‘paste’ interpretation of the lex specialis regime would be unlikely.

344 Grotius, above n 21.
346 Fountain, above n 346, 1769.
347 Ibid. See also Antarctic Treaty art VI. Although States such as Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, USSR, Great Britain and USA have attempted to assert sovereignty in Antarctica, their claims remains frozen in time.
With private non-governmental entities attempting to claim extraterrestrial land and resources, in the Space race, these terrestrial examples remain imperative to understand whether:

(a) a legally valid property rights regime may exist in Outer Space in the absence of a sovereign; and

(b) private entities may assert full set of private property rights as seen in the fee simple examples on Earth, or may only derive a limited right to property in the resources extracted through a licensing regime, as applied in the deep seas.

While a majority of legal scholars continue to rely on the terrestrial analogies from the deep seas or Antarctica to justify a limited right to property in Outer Space, few have studied the private property rights regime established in the Arctic which was once regarded as a territory without any overriding sovereign. Unlike the deep seas and Antarctica, the Arctic islands of Jan Mayen, Spitzbergen and Sverdrup offer a more promising analogy for private property rights to be superimposed onto Outer Space.

A Terrestrial Analogies

1 The Deep Seas

The first notable attempt to claim ownership in the deep seabed occurred in 1974, prior to the adoption of the comprehensive United Nations Convention on the Laws of the Sea (UNCLOS). In this case, an American mining conglomerate, Deepsea Venture Inc (Deepsea Venture), filed an application with the USA State Secretary and the United Nations (UN)
Secretary General, to claim more than 60,000 kilometers in the Pacific Ocean’s Clarion Clipperton area exclusively for exploiting the resources found for mining purposes. As the deep seabed had not been previously appropriated by any other entity, the legal brief which accompanied the claim documents, suggested that it was not only possible for Deepsea Venture to occupy the territory, but also, claim ownership of its resources. Relying on the State’s ability to claim resources, such as pearls and oysters, outside its territorial waters, the legal brief further contended that the deep seabed was capable of being claimed by the private entity. While the company had failed to physically possess the area of its claim, creative legal arguments were advanced to suggest that Deepsea Venture had effectively ‘occupied’ the deep seabed by exercising ‘reasonable diligence’ to exploit the resources in the high seas and investing significantly in the project.

Nevertheless, Deepsea Venture’s claims of the seabed remained largely unacknowledged. While the USA did not expressly prohibit Deepsea Venture from claiming the deep seabed, the USA State Department, in its response to Deepsea Venture asserted that it was in no position to ‘grant’ or ‘recognise’ exclusive mining rights in areas outside its national territory. This refusal to confer private property claims in the deep seabed may be attributed to fears that it would open the floodgates for private entities to claim extensive masses of the deep seabed, impairing free access to its

352 Barkenbus, above n 351, 37; Jiménez de Aréchaga, above n 351, 228; Mahmoudi, above n 355, 98; Biggs, above n 351, 271–2. State ambassadors from Australia, Belgium, Bulgaria, Canada, France, Hungary, Japan, Poland were also notified of the claims.
353 Biggs, above n 351, 272.
354 Barkenbus, above n 351, 37.
355 Ibid 37–8; Biggs, above n 351, 273–4; Mahmoudi, above n 351, 99–100.
356 Barkenbus, above n 351, 37; Biggs, above n 351, 273. Prior to the 1945 Truman Declaration, States exclusively claimed the resources found in the deep seabed. This included claims on pearls, oysters, corals and sponges found in the deep seas.
357 Barkenbus, above n 351, 37–8; Biggs, above n 351, 273–4; Mahmoudi, above n 351, 99–100.
358 Barkenbus, above n 351, 37–8.
359 Ibid.
360 Biggs, above n 355, 273–4; Smith, above n 351, 1045.
Although other political considerations of States refusing to pre-empt the scope of the common heritage of mankind doctrine prior to the third conference played a significant role in Deepsea Venture’s *ab initio* failure to claim property in the deep seabed, it reaffirmed the position that the deep seabed was not *res nullius* territory capable of appropriation by occupation, but rather, *res communis* territory which belonged to no single State or group of States.  

Following attempts to streamline the laws governing the ‘use’ and ‘exploitation’ of the deep seas, UNCLOS established a highly successful and comprehensive treaty with over 150 signatories. Part XI of UNCLOS, remains highly relevant to Outer Space as it predominantly deals with the exploitation of extraterrestrial resources in the deep seas and its seabed. While many of the provisions found in UNCLOS have been recognised by the legal community as customary international norm, the common heritage of mankind doctrine proposed in Part XI of UNCLOS, remains most contentious. Article 136 of UNCLOS specifically designates that areas which fall outside the States’ 200 nautical miles radius or Exclusive Economic Zone (EEZ), are regarded as the ‘common heritage of mankind’. From a legal standpoint, the CHM doctrine called for the equitable sharing of all profits derived from the exploitation of the high seas and the valuable resources found beneath the seabed. In the absence of

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362 Ibid.
363 *UNCLOS* has 157 signatories and 162 parties as of 7 June 2011.
364 *UNCLOS* pt XI.
365 Dalton, above n 260, 7.
367 *UNCLOS* art 136.
368 Dalton, above n 260, 18; *Deep Seabed Hard Mineral Resources Act*, 30 USC §§ 1401–73 (2000). Although the USA adopted most of the provisions of UNCLOS as customary international law, it remained adamant against ratifying the treaty, especially Part XI. To overcome the limitations imposed by the Common Heritage of Mankind doctrine in the exploitation of resources in the deep seabed, USA enacted the *Deep Seabed Hard Minerals Resources Act (DSHMRA)* to protect the interests of private entities seeking to exploit the resources found beneath the seabed. This less
claims for sovereignty in the deep seas, an International Seabed Authority (ISA) was created to license and distribute the proceeds arising from the exploitation of the high seas. Hence, a workable legal regime was formed, allowing private non-governmental entities to assert property rights in the high seas under the existing res communis regime, adopted earlier.

2 Antarctica

While State expeditions to discover Antarctica began as early as the 19th century, it was not until the 20th century that private entities, involved in the whaling boom, began to settle along its coasts. Nevertheless, the validity of these ‘temporary’ settlements were never legally scrutinised as the early settlers continued to operate from their mainland stations and never claimed exclusive property rights in the territory. To date, the issue of private property rights in Antarctica remains largely unaddressed, even the seminal 1959 Antarctic Treaty.

Unlike UNCLOS, the Antarctic Treaty System (ATS) placed greater importance on protecting the Antarctic environment, promoting scientific

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restrictive approach allowing private entities to assert property rights in the deep seabed was adopted in the 1982 UNCLOS.

369 UNCLOS art 137(1).
370 UNCLOS arts156, 157, 140.
371 Fountain, above n 346, 1772.
374 Lee, Commercial Mining, above n 47, 204; Bernhardt, above n 373; Shusterich, above n 373.
376 See especially UNCLOS pt XI. Part IX deals predominantly with the commercial exploitation of natural resources found in the deep seas.
research and preventing territorial disputes from arising in Antarctica.\textsuperscript{378} Although all pre-existing sovereign claims remained frozen in time,\textsuperscript{379} Article VIII of the \textit{Antarctic Treaty} expressly stipulated that all activities carried out by private entities fell exclusively under the jurisdiction of their respective States.\textsuperscript{380} Nevertheless, the commercial exploitation of Antarctica continues to be restricted by ongoing scientific investigations and explorative activities.\textsuperscript{381}

In 1991, the \textit{Madrid Protocol} was signed recognising the need to protect Antarctica’s fragile environment.\textsuperscript{382} All mining activities on Antarctica were banned for a period of fifty years or an infinite period thereafter, until the ban was lifted with the consent of all the contracting States.\textsuperscript{383} While the ban has not yet been lifted with unanimous consent, the creation of private property rights in Antarctic resources remains riddled with controversy.\textsuperscript{384} The \textit{Antarctic Treaty}’s silence on private commercial mining activities,\textsuperscript{385} and the States’ failure to ratify the \textit{1988 Convention on the Regulation of Antarctic Mineral Activities},\textsuperscript{386} which would have otherwise offered private entities a similar exploitation regime as UNCLOS, makes the future of private property rights in the Antarctic Mineral grossly uncertain.\textsuperscript{387}

As the \textit{Madrid Protocol} prohibits all forms of commercial exploitation, except tourism,\textsuperscript{388} the issue of private property rights in Antarctica

\textsuperscript{378} Grier C Raclin, ‘From Ice to Ether: The Adoption of a Regime to Govern Resource Exploitation in Outer Space’ (1986) 7 Northwestern Journal of International Law and Business 727, 745–6; see also \textit{Antarctic Treaty} arts II, IV.
\textsuperscript{379} Madrid Protocol Preamble para 5.
\textsuperscript{380} Madrid Protocol arts 7, 25.
\textsuperscript{381} Sprankling, \textit{International Property Law}, 375, 121–2.
\textsuperscript{382} Madrid Protocol arts I–III.
\textsuperscript{383} Dalton, above n 260, 22; see also \textit{Antarctic Treaty} art II.
\textsuperscript{384} Madrid Protocol Preamble para 5.
\textsuperscript{385} Antarctic Treaty arts II, V, VII. The Antarctic Treaty only addresses activities such as the freedom of scientific investigation (Article II), the prohibition of nuclear activity (Article V) and the freedom to observe and inspect (Article VII).
\textsuperscript{386} Madrid Protocol arts 3(4), 8(2).
predominantly revolves around ‘land-based tourism’, especially the enactment of permanent structures and buildings to facilitate tourism in Antarctica.\textsuperscript{389} In the speech given by the Norwegian Diplomat, the recent developments in the Antarctic tourism industry ‘raise[s] the question of private property rights on the continent, for which no agreed framework in the Antarctic exists’.\textsuperscript{390} While there is nothing in the existing ATS prohibiting private property rights in Antarctica,\textsuperscript{391} private entities have not yet claimed private property rights in the Antarctic land.\textsuperscript{392}

Any developments of private property rights in the future are likely to be derived from the sovereign as private entities build structures and buildings within the boundaries of their respective State ‘stations’.\textsuperscript{393} While States may not pursue new territorial claims in Antarctica, the existing ATS implicitly recognises \textit{de-facto} claims of sovereignty in the land under its stations.\textsuperscript{394} Pursuant to the Antarctic Treaty, States do not only have the authority to construct stations in Antarctica,\textsuperscript{395} but also, allow it to be ‘occupied by its nationals’.\textsuperscript{396} In the current day, State ‘stations’ have emerged in Antarctica with infrastructure and facilities, which may be likened to a ‘small town’.\textsuperscript{397} The McMurdo Station in the Ross Island region of Antarctica, for example, has the capacity to house more than 1200 residents in summer with more than 100 buildings being equipped with modern infrastructural facilities to provide water, power and telecommunication.\textsuperscript{398}

Nevertheless, property rights asserted under this system may be problematic as it does not provide private entities with the ‘exclusive’ right to the

\begin{itemize}
\item \textsuperscript{389} Sprankling, International Property Law, above n 375, 118.
\item \textsuperscript{391} Ibid.
\item \textsuperscript{392} Sprankling, International Property Law, above n 375, 120.
\item \textsuperscript{393} Ibid 120–1.
\item \textsuperscript{394} Ibid.
\item \textsuperscript{395} Ibid 118. See also \textit{Antarctic Treaty} art II, III, VII, VIII, IX.
\item \textsuperscript{396} \textit{Antarctic Treaty} art VII (5)(b), VIII.
\item \textsuperscript{397} Sprankling, International Property Law, above n 375, 121–2.
\item \textsuperscript{398} Ibid.
\end{itemize}
property, which continues to be subject to the ‘free access’ provisions of the Antarctic Treaty. As the Antarctic Treaty allows other States to freely ‘inspect’ and ‘access’ other States’ Stations, all State controlled stations are required to remain open for inspection at all times. Without some form of exclusivity, even for a limited period of time as seen in leasehold lands or licensing regimes, private property rights may not exist in its true form.

B Analysis of Limitations

1 The Deep Seas

Replicating UNCLOS in Outer Space remains tricky for three fundamental reasons. Unlike the high seas, which consists predominantly of uninhabitable masses of land submerged under water and therefore useful only for its resources, extraterrestrial bodies consist of extensive masses of land which may become viable habitats for humans in the future. As the utility derived from using the Moon and other extraterrestrial bodies extends beyond the exploitation of its resources, an equitable sharing regime may be regressive and detrimentally affect all future developments in Outer Space. Geographically, many extraterrestrial bodies, such as the

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399 Ibid. Antarctic Treaty art VII(2).
400 Antarctic Treaty art VII(2), (3).
401 Pop, The Moon, above n 28, 62 for discussions on the Roman Law principles of property. See also Sprankling, Understanding Property Law, above n 213, 4–5 for discussion on the ‘exclusivity’ requirement of property.
402 Richard Young, ‘The Legal Status of Submarine Areas Beneath the High Seas’ (1951) 45(2) The American Journal of International Law 225. Permanent settlements remain unlikely, as only humans in submarines are capable of surviving under the high seas.
404 Austin C Murnane, ‘The Prospector’s Guide to the Galaxy’ (2013) 37 Fordham International Law Journal 235. Murnane highlights that the prospects for the commercialization of Outer Space are extremely wide as private companies such as Planetary Resources, SpaceX and Mars One seek to exploit asteroids, develop transportation networks and establish Martian colonies, respectively.
405 Stephen Gorove, ‘Major Concerns of Private Enterprise’ (Paper presented the 6th Princeton Conference on Space Manufacturing, 1983). Gorove contends that the equitable sharing principles may introduce grave legal uncertainties for private entities seeking to appropriate Outer Space. See also, Ferrer, above n 41, 146. Ferrer highlighted that the equitable sharing principles were unnecessary as all resources derived from the use of Outer Space would directly or indirectly benefit mankind.
Moon and Mars, do not fall directly outside the boundaries of any State or group of States.\textsuperscript{406}

Pursuant to the \textit{lex specialis} principle of Space Law,\textsuperscript{407} the provisions found in UNCLOS, may need to be changed extensively to satisfy the unique characteristics and context of the existing Space Law regime.\textsuperscript{408} As asserted by Rosanna Sattler, the application of UNCLOS in the Outer Space calls for a regime that confers States with ‘exclusive’ rights similar to coastal States, allowing them to regulate the mining activities of their nationals within these stipulated EEZ.\textsuperscript{409} By extending the concept of EEZ to Outer Space, States may be able to assert limited sovereign rights conferred to them by the treaty, without contradicting the ‘national non-appropriation’ principle found in Article II of the OST.\textsuperscript{410} Nevertheless, this approach is particularly problematic as it depends upon the allocation of artificial EEZs in Outer Space. Unlike the boundaries of the deep seas which constitutes of an expressly defined ‘area’,\textsuperscript{411} extraterrestrial bodies, remain abundant with more than 100,000 galaxies identified Laneakia supercluster alone.\textsuperscript{412} On a more myopic scale, without the aid of a ‘pre-existing baseline’, similar to the boundaries of the coastal States, it remains practically incomprehensible to envision the distribution of EEZs in Outer Space.\textsuperscript{413}

Establishing EEZs within the legal confines of the ‘common heritage of mankind’ principle found in UNCLOS remains difficult as the Moon Agreement specifies a ‘less detailed’ regime than its predecessor.\textsuperscript{414} Unlike UNCLOS, which details a legal mechanism for the exploitation of resources in the deep seas, the Moon Agreement fails to establish a similar Outer

\textsuperscript{406}Bogotá Declaration, above n 84.
\textsuperscript{407}Lee, Commercial Mining, above n 47, 127–8. Pursuant to the \textit{lex specialis} principle of Space Law, general principles of International Law may not apply in Outer Space due to its difference in context.
\textsuperscript{408}Vilkari, above n 348, 143–4.
\textsuperscript{409}Sattler, above n 403, 41–4.
\textsuperscript{410}Ibid.
\textsuperscript{411}UNCLOS pt V.
\textsuperscript{413}Dalton, above n 260, 21–2.
\textsuperscript{414}Vilkari, above n 348, 138–140.
Space Authority (OSA) to perform the regulatory functions of the ISA. 415

Conceptually, UNCLOS developed in a period where the exploitation of natural resources in the deep seas was becoming technologically possible and developing nations shared immense power in influencing the development of UNCLOS. 416 While UNCLOS may be valuable in interpreting the CHM concept in Outer Space, it remains unlikely that the extraterrestrial regime would correspond with the existing regime in the high sea as Article 11 of the Moon Agreement introduces an added provision conferring an advantage to countries involved in the exploration of Outer Space to be granted special consideration. 417 As Dalton aptly summarises, this subtle distinction in the implementation of the CHM provision in Article 11 of the Moon Agreement remains key in distinguishing the Outer Space exploitation regime from the laws governing the high seas. 418

2 Antarctica

Although the USA President, Eisenhower, lauded the Antarctic Treaty in its initial stages of development, as being an ideal model to carve out a novel legal regime for Outer Space, 419 this position is unlikely to be advanced in the current day. Unlike UNCLOS, the ATS is unlikely to add to the development of a viable property rights regime in Outer Space. As sovereignty is merely frozen in time and not prohibited in Antarctica, it is unlikely that any private property rights regime would develop, independent of State recognition. 420 This approach would be particularly problematic to replicate in Outer Space, given the express prohibition of ‘national appropriation’ found in Article II of the OST. 421 With the Madrid Protocol prematurely curbing private interests in Antarctica, in an attempt to resolve

415 Ibid 138.
417 Moon Agreement art 11(7).
418 Dalton, above n 260, 22.
420 Dalton, above n 260, 22.
421 Outer Space Treaty art II.
the existing ‘tensions between the community and individuals’,\textsuperscript{422} the development of Antarctic’s legal regime in the future remains unknown, at best, and obscure at worst. Lastly, albeit most importantly, the ATS serves as a poor analogy for the development of the Outer Space legal regime, which predominantly deals with the issue of sovereignty and not private property rights, per se.\textsuperscript{423}

\textit{C Overcoming the Limitations: Re-examining the Arctic Analogies}

From a Lockean standpoint, all property on earth is bestowed upon mankind in common. Contrary to the Hobbes theory of private property rights, the Lockean notion of property implies a ‘natural right’ to private property which exists independent of any State.\textsuperscript{424} Pursuant to Locke’s theory of property, private property rights may not only exist well before any State comes into existence, but also in land where there is no ‘overarching’ sovereign.\textsuperscript{425} Expounding on the public and private dichotomy, Locke further contended that the role of the State remains limited to protecting mankind’s innate right to property which he or she derives naturally from God, rather than the State.\textsuperscript{426}

1 \textit{Arctic}

The Arctic islands of Jan Mayen,\textsuperscript{427} Spitzbergen\textsuperscript{428} and Sverdrup\textsuperscript{429} lend validity to the Lockean theory of property. Serving as a legal precedent for the fact that private property rights may exist well before sovereignty is superimposed over the territory, these Arctic examples provide a useful analogy for encouraging further developments of private property rights in

\textsuperscript{422} Dalton, above n 260, 22.  
\textsuperscript{423} Sprankling, Understanding Property Law, above n 213, 117–8.  
\textsuperscript{424} Locke, Second Treatise, above n 20, ch 5 [25]; Lopata, above n 312.  
\textsuperscript{425} Locke, Second Treatise, above n 20, ch 5.  
\textsuperscript{426} Ibid.  
\textsuperscript{427} The Jan Mayen island is a volcanic island found in the Arctic Ocean. Once regarded as ‘no man’s land’, it now falls under the sovereignty of Norway.  
\textsuperscript{428} With its origins as a whaling base, Spitzbergen remains the largest island in Norway.  
\textsuperscript{429} Despite being founded by a Norwegian national, the island of Sverdrup was recognised as Canadian territory when the Norwegian government failed to stake any territorial claims on the island.
Outer Space, where sovereign appropriation remains prohibited.\textsuperscript{430} International property rights scholar Herschel Grossman contended that private property rights may exist in a vacuum without any overriding sovereign or legal regime.\textsuperscript{431} A similar view is advanced by Smith and Zaibert, who assert that private property rights remain premised upon ‘a function of trust, mutual respect … ontologically dependant on certain customs and habits which might have existed even prior to the existence of the State’.\textsuperscript{432}

Although State sovereignty was eventually imposed over these \textit{terra nullius} Arctic territories, the existing private property rights were never rejected.\textsuperscript{433} The seamless assimilation of private property rights by the newly-appointed sovereign, implicitly acknowledged that:

(a) private entities had an innate right to assert property rights in the Arctic;

(b) valid private property rights existed in the Arctic territories prior to any claims of territorial sovereignty; and

(c) the State’s role was limited to ‘recognising’ these private property rights, and not, ‘granting’ them.

While it remains unlikely that territorial sovereignty would ever be superimposed onto Outer Space at a later date, as it contradicts the national non-appropriation principle,\textsuperscript{434} this does not serve as a sufficiently valid ground to dismiss the invaluable Arctic analogies. This is especially the case, as private property rights in Outer Space may be capable of being ‘acknowledged’ by an international sovereign\textsuperscript{435} or States who only assert

\textsuperscript{430} \textit{Outer Space Treaty} art II. Pursuant to Article II of the \textit{Outer Space Treaty}, all acts of national appropriation are prohibited in Outer Space.


\textsuperscript{434} Pop, The Moon, above n 28, 66–8.

\textsuperscript{435} Dembling, above n 268, 35. Dembling suggested that an international administrative body may be established in the future to deal with the appropriation of Outer Space. Jenks, above n 230, 201. Jenks that the right to appropriate extraterrestrial land and its
de-facto sovereignty, a limited form of sovereignty. As discussed above in Chapter III, it remains highly unlikely that States may rise above the ‘national non-appropriation’ principle found in Article II of the OST by asserting a ‘limited’ form of sovereignty. The ‘recognition’ of private property rights must not be mistaken with the ‘conferral’ or ‘grant’ of private property rights. While the former may exist under de-facto sovereignty, the latter usually calls for de-jure sovereignty or a legal claim to sovereignty in the territory. As the Arctic analogies suggest a legal regime where pre-existing private property rights were merely ‘recognised’, and not ‘conferred’ by a sovereign, it is likely to fall under the former category of de-facto sovereignty which remains applicable to Outer Space.

2 Jan Mayen

The Jan Mayen island found in the Arctic Ocean remains an interesting legal precedent for private property rights in Outer Space, as it did not only highlight that private property rights were capable of existing years before State sovereignty, but also, that these pre-existing rights to property remained immutable even when sovereignty is later superimposed. In 1927, for example, a USA citizen named Hagbard Ekerold began to claim property in the Jan Mayen islands under his USA registered Polarfront Company. Although sovereignty was only imposed on the Jan Mayen islands two years later, Ekerold’s pre-existing claims in Jan Mayen were ‘recognised’ by the Norwegian government. As the Norwegian delegate

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436 Sattler, above n 403, 41–4. Sattler contends that a limited form of sovereignty may be permissible in Outer Space. According to Sattler, the establishment of artificial ‘exclusive economic zones’ allowing States to ‘recognise’ the claims of its nationals would not contravene the national non-appropriation principle in Article II of the Outer Space Treaty.

437 Ibid.

438 Ibid.

439 Cf Pop, Who Owns the Moon, above n 28, 66–8.


441 Ibid 475.
contended, ‘the occupation of Jan Mayen by Norway … in no way … cause[d] changes in the rights which, according to civil law, exist[ed] on the island’. 442 Similarly in case of Jacobsen v Norwegian Government, 443 the Norwegian Supreme Court held in favour of the plaintiff, that the Norwegian government could not claim land that had already been appropriated by a private entity, a long staying resident on the Jan Mayen island. In deciding the matter, careful consideration was given to determine whether valid private property rights had existed prior to the introduction of sovereignty. 444 As the plaintiff, Jacobsen, had effectively occupied the property before Norwegian sovereignty was imposed, his claims were recognised. 445 The court nevertheless made a key observation that private entities may assert valid private property rights in the absence of any sovereign ‘recognition’ or overriding sovereign ‘authority’. 446

‘Individuals … establish[ed] property rights … in [the] Jan Mayen Island in 1921, some eight years before formal annexation by Norway as terra nullius’. 447

3 Sverdrup

Similarly, in the remotely located Sverdrup Islands, discovered and named after renowned Norwegian explorer Otto Sverdrup, Norwegian sovereignty was never imposed over the island. 448 Recognising Otto Sverdrup’s possible right to property on the island, the Canadian government offered to pay him $67,000 for the maps of the island and any other documents evidencing his voyage. 449 Had the Canadian government regarded the Sverdrup Island as being claimed by Otto Sverdrup for Norway, any compensation offered to him would have been unnecessary. In other words, if no valid ‘private claims’ or ‘sovereignty’ had been asserted on the Sverdrup island since

442 Ibid 475–6.
444 Ibid.
445 Ibid.
446 Ibid.
447 Derek W Bowett, The Legal Regime of Islands in International Law (Oceana, 1979) 59.
448 Byers and Baker, above n 433, 24–5.
449 Ibid.
discovery, the Canadian government would not have required permission to impose Canadian sovereignty over the supposedly *terra nullius* territory. Without any prior claims of sovereignty on the island,\(^450\) the Canadian government’s ‘act’ of offering valuable compensation to private explorer, Otto Sverdrup, is likely to implicitly reaffirm his innate right to property in the Island and the validity of his private property rights claim.

4 **Spitzbergen**

Out of all the Arctic examples, the Spitzbergen Islands serves as the best analogy in favour of private property claims asserted in ‘no man’s land’, the *terra nullius* land. It not only re-affirmed that private property rights were capable of existing in land without any overriding sovereign, but also, that it was likely to be recognised at a later date if sovereignty is eventually imposed. The organic development of property rights on the island, remains commendable.

Developments in the private property rights regime on the Spitzbergen Islands began as early as the 20\(^{th}\) century when it became an area frequented by ‘whalers’ and ‘hunters’ belonging to a wide variety of different nationalities.\(^451\) Permanent occupation of the island remained impossible due to the harsh weather conditions leaving the islands inhabitable for up to nine months each year.\(^452\) Nevertheless, no sovereignty was asserted in the territory.\(^453\)

This position quickly changed with the discovery of rich sources of coal.\(^454\) States which were initially disinterested in asserting sovereignty in the Island, became adamant about protecting the interests of their nationals, especially the private property rights which had been asserted in the

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\(^{450}\) Ibid 25.
\(^{452}\) Ibid.
\(^{453}\) Ibid 764.
\(^{454}\) Ibid 763–4.
Spitzbergen Island previously.\textsuperscript{455} In a frantic attempt to notify the world, many private non-governmental entities began turning to their respective sovereigns to inform them of their claims on the Spitzbergen Island.\textsuperscript{456}

Although sovereignty was eventually vested in the Norwegian government, the \textit{1920 Spitzbergen Treaty}\textsuperscript{457} carved out a unique, unprecedented solution ‘recognising’ these pre-existing private property rights in the Spitzbergen Island.\textsuperscript{458} Pursuant to Article 6 of the Treaty, all claims asserted by private entities taking ‘possession’ or ‘occupation’ of the Island, were recognised.\textsuperscript{459} The administration of these private property rights was dealt with in further detail in Annex 1 of the Treaty which called for the private entities to ‘notify’ the Norwegian government of all claims which had been asserted prior to signing the Spitzbergen Treaty.\textsuperscript{460} Upon satisfying the Commissioner that a valid claim existed,\textsuperscript{461} the private entity was conferred with a title ‘recognising’ his or her exclusive use of the land.\textsuperscript{462} Any claims which remained ‘unrecognised’ by the Commissioner\textsuperscript{463} or unresolved even after arbitration\textsuperscript{464} were extinguished.\textsuperscript{465}

\begin{footnotes}
\footnote{455}{Ibid 763–4. In rhetoric, Lansing aptly summarises the problems private entities may face in protecting their private property rights in ‘no man’s land’:

If this population increased and persons of different nationalities settled in the islands laying claim to lands already claimed by others, how would these people be governed and to what authority could they appeal to settle their conflicting claims and to protect them in the enjoyment of their rights?}

\footnote{456}{Pop, Who Owns the Moon, above n 28, 67.}

\footnote{457}{\textit{Treaty Concerning the Archipelago of Spitsbergen}, signed 9 February 1920, [1925] ATS 10 (entered into force 14 August 1925) (‘Spitzbergen Treaty’).}

\footnote{458}{Lansing, above n 451, 475. According to Lansing the circumstances in the Spitzbergen Island were unprecedented:

The situation is one that is entirely novel. The records of history will be searched in vain for precedents. The common conception of government carries with it the idea of a state and that idea seems to be inseparable from territorial sovereignty.}

\footnote{459}{Spitzbergen Treaty art 6.}

\footnote{460}{Ibid annex 1(1).}

\footnote{461}{Ibid annex 1(1)–(8).}

\footnote{462}{Ibid annex 1(9).}

\footnote{463}{Ibid annex 1.}

\footnote{464}{Ibid annex 2.}

\footnote{465}{Ibid annex 3.}
\end{footnotes}
D Outer Space: The New Arctic?

While the Arctic analogies offer a promising start in determining whether private property rights may exist in Outer Space under the existing legal regime, it does not resolve the current ambiguities which plague this regime.

As private entities from a plethora of different nations advance towards Outer Space,\(^{466}\) in an attempt to claim exclusive ownership over its land and resources, it is likely to result in various competing claims being asserted on land where there is no overriding sovereign authority. Like the Arctic, as these Outer Space land and resource claims become more commercially viable, States are likely to become interested in protecting the pre-existing claims of their nationals.\(^{467}\)

Although the Arctic analogies are likely to serve as valuable legal precedent re-affirming private entities’ ability to appropriate extraterrestrial land and resources on a first come first serve basis, any subsequent ‘recognition’ or ‘endorsement’ by the State remains impossible in Outer Space as it prohibits all forms of sovereignty. Simply put, while the Arctic territories answer in the affirmative that valid private property rights asserted may exist in Outer Space as private non-governmental entities occupy its land, it continues to leave a jarring gap on how these property rights may be subsequently ‘recognised’ or ‘administered’. Nevertheless, a workable property rights regime, which introduces greater certainty in Outer Space remains critical to avoid the chaos, which existed in the Spitzbergen Islands, prior to the enactment of the Spitzbergen Treaty.

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\(^{466}\) As individuals venture towards Planets such as Mars it is likely that any private property claims in Outer Space, similar to those asserted on the Spitzbergen Islands, would arise from settlers of different nationalities. See, eg, Jennifer Jaurez and Elizabeth Landau, ‘More than 100,000 want to Go to Mars and Not Return’, CNN (online) 15 August 2013 <http://edition.cnn.com/2013/08/09/tech/innovation/mars-one-applications/>. Mars One, Meet The Mars 100 <https://community.mars-one.com/last_activity/ALL/18/82/ALL/ALL/5/3>. The hundred individuals selected for this journey to colonise Mars come from a multitude of different countries ranging from Japan to Denmark.

\(^{467}\) See, eg, American Space Technology for Exploring Resource Opportunities in Deep Space (ASTEROIDS) Act, HR 5063, 113\textsuperscript{th} Congress (2014) §§ 51301, 51302. The United States of America has already begun looking towards protecting the claims of private entities in Outer Space.
Despite its remarkable resemblance with Outer Space, the mounting uncertainty in the property rights regime in Outer Space, cannot simply be resolved by ‘superimposing’ an Arctic legal regime. Firstly, it remains uncertain which governmental or regulatory bodies, if any, would play the Norwegian governments equivalent in recognising private property rights in Outer Space. Secondly, unlike the Arctic islands of Spitzbergen, Outer Space is already pre-disposed to an existing legal regime and doctrines such as the CHM are likely to cause a significant deviation in any property rights regime which may be proposed in the future.
V THE SOLUTION: OVERCOMING THE UNWORKABLE PROPERTY RIGHTS REGIME

Earth is the cradle of mankind:
but one cannot stay in the cradle forever
Konstantin Tsiolkovsky

A Land beyond the Sovereign: Terra Nullius or Terra Communis

Although a minority of legal scholars including Verplaetse and Bin Cheng suggested that Outer Space should be governed by the principles of res nullius, which refers to property without an owner, but capable of ownership by anyone including a sovereign, this proposition was rejected by subsequent legal literature. It is now commonly accepted that Outer Space Property is regarded as res communis but the distinction between res communis omnium and res extra commercium remains a little more obscure.

Despite Goedhuis and Mayer contending in favour of the Roman private law concept of res communis omnium, this ‘traditional’ res communis approach is problematic. As the ‘traditional’ res communis concept remains entrenched in the principles of ‘individualism’, this inherently contradicts its ‘community oriented’ underpinnings. Despite the subtle distinction, the concept of res extra commercium is interchangeably used with the concept of res communis omnium, to refer to

469 Bin Cheng, ‘From Air Law to Space Law’ (1960) 13 Current Legal Problems 229, 234. Note this was one of the earlier works by Bin Cheng. His later works deviated away from the concept of res nullius in Outer Space.
473 The principle of Res Communis Omnium refers to territory capable of free use by any state or private entity but precluded from private ownership.
the Outer Space regime. While the res extra commercium principle finds striking parallels in both the deep sea and outer space regime, it specifically deals with ‘things outside commerce … [that are] not subject to national appropriation, but open to all’.475

Commenting on the res communis theory in the context of the high seas, Van Hoof, brought forth an interesting distinction between the res communis theory and the res communis humanitatis.476 While the former theory imposes a formidable ‘formal equality’ the latter seeks ‘substantive equality … ensuring that the benefits flowing from the use of areas beyond the limits of national jurisdiction … are equitably shared’.477 Leading space scholars, including Christol478 and Bin Cheng479 have adopted this concept of res communis humanitatis to fill in the gaps arising immediately after the introduction of the ‘common heritage of mankind doctrine’ in Outer Space. Although Bin Cheng acknowledges that the res communis humanitatis is not precisely defined, he contends that it:

‘conveys the idea that the management, exploitation and distribution of natural resources … are matters to be decided by the international community … and are not to be left to the initiative and discretion of individual States or their nationals’.480

475 Tronchetti, above n 36, 13.
478 Christol, above n 66, 440.
479 Bin Cheng, The Legal Regime of Airspace and Outer Space, above n 476.
480 Ibid.
B Tragedy of the Common Heritage of Mankind (CHM) Doctrine

The Commons regime is not new to mankind.\textsuperscript{481} Having existed as early as the sixth century when areas such as the sea, its shores and air were considered communal property, the \textit{res communis} principle applied to public goods which were not capable of ownership or possession by any private or public entity.\textsuperscript{482} It allowed private entities to ‘use’ the communal property without obstruction, while affording other private entities the same privilege to ‘use’ the property when it was no longer utilised by the first entity.\textsuperscript{483} According to the French jurist Pothier:

\begin{quote}
\textit{things which were common to all belonged no more to one than to the others … no one could prevent another from taking these common things …} whilst he was using them, others could not disturb him; but when he ceased to use them … another could use them.\textsuperscript{484}
\end{quote}

While the legal interpretation of the CHM has evolved over the years,\textsuperscript{485} territories governed by the doctrine remain subject to profit sharing provisions mandating the equitable sharing of all benefits derived from the

\textsuperscript{481} Baslar, above n 474, 80; Kevin V Cook, ‘The Discovery of Lunar Water: An Opportunity to Develop a Workable Moon Treaty’ (1999) 11 \textit{Georgetown International Environmental Law Review} 647, 656–9; Guntrip, above n 361, 387. See also \textit{Moon Agreement} art 11; \textit{UNCLOS} arts 136, 140. The common heritage of mankind principle:

\begin{itemize}
\item[(a)] prohibits private appropriation;
\item[(b)] allows the peaceful use of the land;
\item[(c)] mandates parties to share the benefits derived from its exploitation; and
\item[(d)] establishes an international management regime.
\end{itemize}

\textsuperscript{482} Ceasar Flavius Justinian, \textit{The Institutes of Justinian} (J B Moyle trans, Oxford, 1913) vol 2, ch 1 [trans of: \textit{Institutiones Justiniani} (first published 533)]. The Roman law private property rights regime states that the running water, seas and seashore:

\begin{quote}
are by natural law common to all … no one is therefore forbidden access to the seashore … the public use of the seashore, as of the sea itself, is part of the law of nations; consequently every one is free to build a cottage upon it for purposes of retreat, as well as to dry his nets and haul them up from the sea. But they cannot be said to belong to any one as private property, but rather are subject to the same law as the sea itself, with the soil or sand which lies beneath it.
\end{quote}

\textsuperscript{483} \textit{Geer v Connecticut}, 161 US 519 (Sup Ct, 1896).
\textsuperscript{484} Ibid.
\textsuperscript{485} See Tronchetti, above n 36, 91–125 for a detailed discussion on the origins and evolution of the common heritage of mankind principle.
exploitation of the land and its resources.\footnote{Baslar, above n 474; Guntrip, above n 361, 387.} Ironically, the doctrine which promotes the ‘preservation’ and ‘collective management’ of the global commons, results in the over exploitation of natural resources.\footnote{Garrett Hardin, ‘The Tragedy of the Commons’ (1968) 162 Science 1243, 1244–5; see also Fred P Bosselman, ‘Replaying the Tragedy of Commons’ (1996) 13 Yale Journal of Regulations 391, 391–2.} As individuals pursue their own interests over the interests of the community, the benefits gained from the maximum exploitation of natural resources by the individual far outweigh the costs incurred by the community at large.\footnote{Hardin, above n 487, 1244. Hardin contends that the commons regime fosters the over exploitation of resources as each private entity, in the herd, asks themselves: 

> [t]he rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another; and another …

\footnote{Ibid. According to Hardin, the detriment suffered by the community far outweighs the utility gained by the individual: 

> Since the herdsman receives all the proceeds from the sale of the additional animal, the positive utility is nearly +1 … however, the effects of overgrazing [created by one more animal] are shared by all the herdsmen, the negative utility for any particular decision making herdsman is only a fraction of –1.} Often categorised as the ‘tragedy of the commons’, the CHM leads to a disproportional enjoyment of the benefits by one individual at the expense of all others.\footnote{Ibid.} As Hardin aptly summarised in his seminal work, The Tragedy of the Global Commons, the problematic nature of the CHM principle is best evidenced when:

> [e]ach man is locked into a system that compels him to increase his heard without limiting a world that is limited. Ruin is the destination towards which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons.\footnote{Ibid.}

In the context of Outer Space, the CHM doctrine renders the Moon and all other celestial bodies as the property of everybody’s, yet nobody’s.\footnote{Pop, above n 28, 73–4.} Pursuant to the ‘province of mankind’ doctrine found in Article I of the OST, the Moon and all other celestial bodies remain the common property of all people and states and therefore, open to all to freely ‘explore’ and
While the over-exploitation of Outer Space remains a non-issue as private entities have not yet begun exploiting these extraterrestrial land and resources, advancing the CHM doctrine may lead to dire consequences synonymous with the over-exploitation of resources on Earth. From an economic standpoint, the CHM doctrine imposes an unnecessary financial burden on private entities to share their benefits, undermining their ability to recoup their investments. The application of the CHM doctrine in Outer Space, coupled with the surrounding ambiguity in the private property rights regime, has grossly impeded future developments in Outer Space.

Under the CHM doctrine, private property rights in Outer Space may never exist in its full form. As private property rights are premised upon three key criteria, namely the right to ‘use’, ‘benefit’ from and ‘abuse’ property, all three must be present before private property rights may be asserted in the extraterrestrial land and resources. While the right to ‘use’ and ‘benefit’ from the property is inherently implied in the application of the CHM doctrine, the right to ‘abuse’ property appears more obscure. Arising from the need to assert full control over the property, the right to ‘abuse’ property under the civil law traditions involves ‘the right to dispose of one’s property – to transform, destroy and alienate it’.

As the res communis principle

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492 Outer Space Treaty art I. The phrase ‘province of mankind’ is often used interchangeably with the ‘common heritage of mankind’ by leading space law academics.
493 Fountain, above n 345, 1760.
494 Ibid.
496 Pop, The Moon, above n 28, 62.
497 Ibid 76–7.
prohibits private entities from asserting full control over the property in perpetuity even when it is no longer being used, the right to ‘abuse’ property in Outer Space may be limited. Similarly any transfer of pre-existing interests in the extraterrestrial land remains impossible under the CHM doctrine.

C Re-evaluating Hugo Grotius’ Mere Liberum

Although the development of the existing Outer Space legal regime is largely derived from UNCLOS, which in turn draws from the works of Dutch scholar, Hugo Grotius’ *mare liberum*,499 its archaic principles must be urgently re-interpreted. According to Listner, the commons paradigm does not only stifle the commercial development of Outer Space, but also, mankind’s expansion towards the final frontier.500 While Hugo Grotius’ categorisation of the *res communis* property as belonging to all mankind is not problematic, his interpretation that communal property is not capable of ‘exclusive ownership’ is unnecessarily restrictive.501

A better interpretation of communal property is entrenched in the Lockean ‘labour theory’ of property. The Lockean epistemology, provides a noteworthy theory to reform the existing Outer Space Treaties, while recognising the notion of common property. This theory is highly beneficial, as it does not prohibit the extraction of resources found on the moon and other celestial bodies while contributing to the benefit of mankind. According to Locke, property bestowed upon man in common need not remain communal property and is capable of private appropriation.502 This

501 Brilmayer and Klein, above n 499, 707; Fountain, above n 345, 1759. Pursuant to Hugo Grotius’ theory on the freedom of the seas, things which could not be ‘enclosed’ or ‘contained’ are not regarded as property. Grotius further claimed that the seas were the common property of mankind and therefore not capable of exclusive ownership by any entity.
502 Locke, Second Treatise, above n 20, ch 5 [26].
is best exemplified in the Locke’s seminal work in the Second Treatise of Civil Government which states that:

God gave the world to men in common, but since He gave it to them for their benefit and the greatest conveniences of life they were capable to draw from it, it cannot be supposed He meant it should always remain common.  

A similar position was advanced by Pothier who suggested that while the ‘first of mankind’ shared property on Earth in common, it was subsequently partitioned by men as ‘the human race multiplied’.  

As the world was bequeathed to ‘men in common … by the spontaneous hand of nature’, it is incapable of becoming the property of any private entity in its ‘natural state’. Nevertheless, men’s relentless quest for resources to sustain himself reaffirms his need to privately appropriate property beneficially for his use. Quoting the archaic example of native Indian hunters, Locke reaffirmed the need for the native Indians to be able to exclusively claim the ‘fruits’ and ‘venison’ which they heavily rely on for their nourishment. Without the ability to assert exclusive private property rights, to the exclusion of all others, the native Indian remained incapable of deriving any benefit from the land.

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503 Ibid [34].  
505 Locke, Second Treatise, above n 20, ch 5 [26].  
506 Ibid.  
507 Ibid.  
508 Ibid.
D Homesteading the CHM Doctrine

Private property rights asserted in land adds to the CHM doctrine especially when it leaves behind property in a similar abundance for others to appropriate:

[M]en had a right to appropriate, by their labour … as much of the things of nature, as he could use … [without] prejudic[ing] others, where the same plenty was still left to those who would use the same industry.509

When applied to the context of Outer Space, the Lockean theory of property is likely to favour the appropriation of private property rights in Outer Space. With more than 100,000 known galaxies in Outer Space and trillions of comets in the Oort cloud alone, the resources and land in Outer Space remains virtually infinite.510 As Outer Space promises enough land for humans to ‘privately’ appropriate ‘world-sized heavens’ for ‘every member of the human species, back to the first ape-man’,511 it remains unlikely that private property rights asserted by one or more individuals, would significantly undermine others from asserting a similar set of property rights.

The appropriation of CHM territory is not without legal precedent. In the 19th century homesteading movement, the USA government took on a mammoth task of establishing a private property rights regime in the communal property, which the USA had recently acquired.512 Recognising

509 Ibid [37].
the need to expand human settlements into the ‘Great American Desert’, the USA Senator Seward contended that these high plains were:

part of the common heritage of mankind, bestowed upon them by the Creator of the Universe … [on] trust to secure in the highest attainable degree of happiness [for his stewards].\textsuperscript{513}

Instead of selling these uninhabited lands, the USA government established a regime to give away all public land free of charge to parties willing to appropriate the land with their own labour.\textsuperscript{514} Under this scheme, many individuals migrated from the east to the west in hopes of appropriating the 160 acres they were provided.\textsuperscript{515} According to Greely, this homesteading movement was consistent with man’s inherent right to ‘use any portion of the earth’s surface not actually in use by another’.\textsuperscript{516} By granting the early settlers the option to buy the land at $1.25 six months later, the homesteading movement ensured that the property remained only in the hands of private entities most capable of appropriating it.\textsuperscript{517} For extraterrestrial bodies, such as the Moon and other celestial bodies, the homesteading movement provides an aspiration to advance human settlements into Outer Space unlocking new resources and opportunities. At the very least, the homesteading movement establishes that private property rights are possible in territory once regarded as ‘communal’.

\textsuperscript{514} F J Turner, ‘The Significance of the Frontier in American History’ (Speech delivered at the Proceedings of the State Historical Society in Wisconsin, 14 December 1893).
\textsuperscript{515} Hill, above n 512, 197.
\textsuperscript{517} Hill, above n 512, 197.
E Importing a ‘New’ Interpretation of the Public Trust Doctrine into Outer Space

While any future developments in the Outer Space legal regime remains a matter of political discourse, the private law of ‘public trusts’ offers an interesting solution for private property rights in Outer Space. Balancing the interests of the private entities with the community at large, this system proposes a regime where legal title would be vested in the an overarching international body to administer private property rights in Outer Space for the benefit of mankind as a whole. As the trustee or ‘legal owner’ of property in Outer Space, these ‘overarching international bodies’ will have the obligation to hold the extraterrestrial property ‘on trust’ for the public as a whole.

The modern application of space law in the geostationary orbit, best illustrates the current use of the public trust doctrine in Outer Space. By creating a licensing regime regulated by the International Telecommunication Union (ITU), the ITU commands the role of a trustee permitting the equitable distribution of any benefits which may arise from the use of the orbit. Satellites appropriate the geostationary orbit slots on a first come, first served basis, and all foreign interference in the area is ‘avoided’.

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518 Jenks, above n 230, 297. According to renowned space law scholar, Jenks, the development of private property rights beyond the ‘facility’ of a space station remains a matter best left for political discourse. Cf White, Real Property Rights, above n 10. White contends that the developments of private property rights in Outer Space must not be conveniently categorised as a matter for political discourse.

519 Francis Lyall, ‘The Role of the International Telecommunication Union’ in Gabriel Lafferanderie and Daphne Crowther (eds), Outlook on Space Law Over the Next 30 Years (Martinus Nijhoff, 1997) 253, 255–6; Fountain, above n 345, 1767. Fountain discusses in detail the modern applications of space law and the allocation of the geostationary orbital slots by the International Telecommunication Union (ITU). Unlike treaties, the ITU regulations allowed both the States and private sector to join as members. This specialist body has three sectors namely the Radiocommunication Sector, The Telecommunication Standardisation Sector and the Telecommunication Development Sector.

520 Fountain, above n 345, 1767.


522 Ibid 1767.

If translated to Outer Space, the recognition of private entities’ occupation of extraterrestrial land by an overarching regulatory body is likely to be synonymous with the functional property rights regime advanced by White.\textsuperscript{524} As private entities begin to enact permanent structures in the area, this ‘act’ would automatically prohibit other private entities’ from using or appropriating the same piece of extraterrestrial land.\textsuperscript{525} However, any form of property rights accorded by an overarching international body is likely to resemble nothing more than a limited right to property.\textsuperscript{526} If the allocation of private property rights in Outer space is premised upon a licensing regime, the rights conferred to the private entity would be more restrictive.\textsuperscript{527} Private property may not exist in its true form as private entities would only be granted an interest in the land for a stipulated period of time and incapable of transferring their beneficiary interests freely in the extraterrestrial land to third party, without the prior consent of the overarching international body.\textsuperscript{528}

Nevertheless, a key distinction must be drawn between the geostationary orbit and extraterrestrial land. While the former is unlikely to become an area of human settlement, the latter remains a frontier which private entities aim to conquer sometime in the near future.\textsuperscript{529} If private settlements were to ever become possible on extraterrestrial lands such as the Moon and other

\textsuperscript{524} White, Real Property Rights, above n 10.
\textsuperscript{525} Ibid.
\textsuperscript{526} Gerald R Faulhaber and David J Farber, ‘Spectrum Management: Property Rights, Markets, and the Commons’ in Lorrie Faith Cranor and Steven S Wildman (eds), \textit{Rethinking Rights and Regulations: Institutional Responses to New Communication Technologies} (MIT Press, 2003) 193, 196. Faulhaber and Farber highlight that the licensing regime does ‘not grant … any property rights in the spectrum beyond that of the license’.
\textsuperscript{527} Ibid.
\textsuperscript{528} Ibid 193–7.
\textsuperscript{529} Silverman, above n 5; Reynolds and Kopel, above n 236; Murnane, above n 404; Gabriel Lafferranderie, ‘Introduction’ in Lorrie Faith Cranor and Steven S Wildman (eds), \textit{Rethinking Rights and Regulations: Institutional Responses to New Communication Technologies} (MIT Press, 2003) 3. Lafferranderie traces the historical developments in space law. Lafferranderie contends that the issue of Martian colonies and Lunar civilisations were fervently explored by academics in the late 1950s. Nevertheless, no consensus was ever reached on the topic.
celestial bodies, the temporary licensing regime simply would not suffice. Some form of fee simple estate, or its equivalent may be necessary for private entities to be able to enjoy, use and exploit the property in its entirety.

<table>
<thead>
<tr>
<th>Traditional Public Trust Doctrine</th>
<th>New Public Trust Doctrine</th>
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<tbody>
<tr>
<td><strong>Source</strong></td>
<td><strong>Settlor</strong></td>
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<tr>
<td>Origins of Property</td>
<td>Establishes</td>
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<tr>
<td>Property</td>
<td>Trust</td>
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<td>Treaty or Customary Norm</td>
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<td>Property Union (IPU)</td>
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Diagram 2: Comparison between Grotius’ and Lockean Epistemology of Property in Application of the Public Trust Doctrine

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Hence, the existing public-trust doctrine must be deconstructed and re-constructed to better balance the interests of the private entities and the community at large. Instead of assuming the role of the trustee, the international regulatory body or International Property Union (IPU) would take on the role of the settlor transferring the ‘legal title’ to the private entity to hold it on trust for the ‘benefit of mankind’ (see diagram 2). Under the Lockean epistemology, the ‘benefit of mankind’ merely refers to the use of labour to ‘increase the common stock of mankind’:

“He that incloses land, and has a greater plenty of the conveniences of life from ten acres, that he could have from an hundred left to nature, may truly be said to give ninety acres to mankind.”

Apart from the added restriction to only appropriate reasonably sized pieces of land which is ‘used’ by the private entity, the Lockean theory of property may provide the closest analogy to replicate the fee-simple estate which currently exists on Earth. As Article II of the OST merely prohibits national appropriation and not international appropriation, it is unlikely that the initial vesting of extraterrestrial property rights in the international regulatory body would be objected. Hence, this ‘new’ public trust doctrine would not only be ideal but robust to meet the changing needs of private property rights in Outer Space. More importantly, this regime is likely to promote a positive property rights allocation regime that overcomes the existing ambiguities in the Outer Space legal regime.

531 Locke, Second Treatise, above n 20, ch 5 [37].
532 Ibid [32]–[33].
533 Outer Space Treaty art II.
In the absence of disparaging judicial literature and ambiguous treaty provisions, the issue of private property rights remains largely unresolved in Outer Space. Falling prey to a plethora of ‘imprecise’ rules and scarce legal norms, the existing space law regime leaves a hostile void which must be filled before the commercialisation of Outer Space can occur. While it may be argued that private property rights may be permissible in the absence of any express prohibitions in the existing Outer Space Treaty, this would be a weak argument as the application of the ‘residual negative’ principle remains highly controversial.

Although the work of publicists promises the ‘richest source’ of law on the viability of private property rights in Outer Space, the lack of consensus amongst scholars has made the application of the existing legal regime more ‘obscure’. The wide array of legal arguments advanced in the existing literature, re-affirms the unsettling nature of the existing Outer Space legal regime, especially the application of the ‘national non-appropriation’ principle found in Article II of the OST. While proponents of private property rights in Outer Space favour a literal interpretation of the provision, opponents look at the OST more holistically to suggest that all acts of private entities automatically amount to acts of the State and therefore should be prohibited. Amidst the mounting ambiguities, the most accurate reflection of private property rights remains that these rights, while plausible, may not be legally ‘recognised’ under the existing Outer Space regime.

Even if private property rights were to become expressly ‘recognised’ at a later date, it remains unlikely that claims for entire extraterrestrial bodies, such as the Moon and Mars, may be permitted. Private entities such, as the Lunar Embassy, which purport to sell plots of land on the Moon are unlikely to confer ownership to third parties, without first asserting some form of
possession of the land. Under the functional property rights approach, it remains highly unlikely that any one private entity would be granted exclusive possession of property more than he or she can reasonably ‘use’.

While the legal regimes governing the other global commons, such as the high seas and Antarctica, offer valuable insights into the future developments of private property rights in Outer Space, a simple ‘cut’ and ‘paste’ legal reform remains unlikely in the lex specialis of Space law. Dealing predominantly with issues of sovereignty, rather than, private property rights, the Antarctic Treaty System offers no assistance for the development of private property rights in Outer Space. Similarly, the application of UNCLOS would lead to bizarre consequences in Outer Space by setting up artificial ‘exclusive economic zones’ where states would be able to assert a limited form of sovereignty to regulate the mining activities of their nationals.

Unlike the high seas and Antarctica, extraterrestrial bodies, such the Moon and Mars are likely to transition into territories housing permanent human settlements in the future. The private appropriation of property on ‘Earth’ serves as the best analogy for future developments in Outer Space. Bestowed upon mankind in common, the civil law traditions of property re-affirms private entities’ innate right to claim property in the absence of any overriding State. This view is further supported in the Arctic islands of Jan Mayen, Spitzbergen and Sverdrup where private property rights came into existence well before any form of sovereignty was superimposed onto the land. As the existing OST, prohibits ‘national sovereignty’, the Arctic islands may offer the best analogy for private property rights in Outer Space.

534 Silverman, above n 5; Reynolds and Kopel, above n 236; van Ballegoyen, above n 263; Murnane, above n 404; Jaurez and Landau, above n 466.
535 Locke, Second Treatise, above n 20, ch 5 [26].
536 Declaration of the Rights of Man art 17; Gilson, above n 28. According to the Civil law, private property remains an inherent right of man and does not derive its validity from any sovereign.
While Outer Space is predominantly categorised as *res communis*, or the communal property belonging to the ‘common heritage of mankind’, the current legal interpretation of the CHM doctrine has the potential to impede future developments in Outer Space. The legal interpretations of the CHM must evolve, yet again, in the context of the Outer Space property rights regime to overcome the logical fallacy of communal property which remains the property of everybody’s and yet nobody’s. Appealing to the Lockean labour theory of property, it remains likely that Outer Space, like Earth, is bestowed upon ‘man in common’ but need not remain so, as private entities begin appropriating land in Outer Space:

‘God gave the world to men in common, but since He gave it to them for their benefit and the greatest conveniences of life they were capable to draw from it, it cannot be supposed He meant it should always remain common.’

As the human race multiplies into Outer Space, private entities may begin partitioning the ‘shared property of mankind’ and asserting private property rights in Outer Space. While these rights are likely to be ‘recognised’ after a prolonged period of time, as seen in the Arctic analogies, the chaos and uncertainty which the existing Outer Space legal regime introduces remains crippling for private entities seeking to appropriate extraterrestrial land and resources.

Nevertheless, the future of private property rights in Outer Space rests on treacherous grounds. With the express prohibition of State sovereignty and no overriding international regulatory body, it remains difficult to establish a private property rights regime that remotely resembles the fee-simple estate on Earth. In essence, while the enactment of new treaties is best left for future political discourse, legal precedents such as the 19th century homesteading movement and the ‘public’ trust doctrine serve as a good

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537 Locke, Second Treatise, above n 20, ch 5 [33].
starting point for the future administration of private property rights in Outer Space.
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