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Redefining Outer Space:

A Copernican Shift for Space Law

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1 Introduction

Is there a fundamental flaw in space law? This essay argues that there is. This flaw stems from our earthly perspective on our home planet, 'looking out' at space. The *Outer Space Treaty*[1] (OST), dubbed the "Magna Carta of space law,"[2] embeds this geocentric perspective. Space law tends to leave "outer space" undefined,[3] a gap we have an opportunity to correct. But it is clear that the OST has made earth the centre of the legal universe. It assumes Earth is "exospatial"[4] – outside the definition of "outer space" – and thus outside the scope of the treaty's Article II non-appropriation principle. This geo-centric flaw positions Earth as the sole source of sovereignty in the cosmos, a premise reinforced by Article VI, binding all space activities to Earth states' jurisdiction. Does it really make sense that Earth is, and forever will be, the only source of sovereignty in the Cosmos?

What follows in this paper is an attempt to expose this conceptual absurdity through some thought experiments that explore off-planet perspectives: that of a Martian settler who sees Earth as one of many specks in the sky, but the only one lording over her world; that of a space human, a member of a civilisation spanning the solar system, who lives an entire lifetime in microgravity. And if I fail to change your perspective by the end of this paper, just think of this: in about 5 billion years, our Sun will expand beyond Earth's orbit.[5] If humans are still alive by then, planet hopping to safety, a vanishing Earth and its status as the singular sovereign of space law collapses into absurdity. It is clear that the law will have to change, eventually.

Once the problem is understood, the solution proposes itself. We need a definition of "outer space" that makes sense. The Celestial Subjectivity Model[6] (CSM), proposed by legal scholar Zach Miller, is the Copernican leap that space law needs. CSM redefines "outer space" as the

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[1] *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies* (Outer Space Treaty) 610 UNTS 205 (opened for signature 27 January 1967, entered into force 10 October 1967).
[2] Zach Miller, "The Great Unknown of the Outer Space Treaty: Interpreting the Term Outer Space" (2018) 46 Denv J Int'l L & Pol'y 349, at 354.
[3] Ibid, at 355.
[4] Zach Miller, "Space Settlement and the Celestial Subjectivity Model: Shifting Our Legal Perspective of the Universe" in Annette Froehlich (ed), *A Fresh View on the Outer Space Treaty* (Springer International Publishing AG, Cham, 2018) at s 6.3.1.
[5] KP Schröder and RC Smith "Distant Future of the Sun and Earth Revisited" (2008) 386 *Monthly Notices of the Royal Astronomical Society* 155, at 163.
[6] Zach Miller, "Space Settlement" in Froehlich, above n 4.

region beyond a celestial body's gravity well, relative to its settlers.[7] Earth becomes one celestial body among equals, rather than being exempt from the OST. It reinterprets Article II to permit sovereignty for emergent states that meet *Montevideo Convention* criteria,[8] fostering equality among celestial states.

This essay will also highlight the practical limitations space law has for fostering the needs of human habitation in space; examining contemporary challenges from private enterprises like SpaceX, already asserting Mars as a "free planet" beyond Earth's authority.[9] This topic has not yet sparked urgency among lawmakers, but it should. Elon Musk has said that the first uncrewed Starships will launch during the next Earth-Mars transfer window in late 2026.[10] While the current space law framework is okay for exploration and scientific outposts on celestial bodies, reform is needed to remove the barriers to permanent human settlement. Without reform, the OST framework risks collapse or conflict from emerging celestial states expressing their right to self-determination, undermining the treaty's peacekeeping intent. Codifying CSM principles and equality of celestial states through a Martian Agreement will allow space law to adapt to a multiplanetary future, ensuring stability as humanity expands outward.

2 The conceptual flaw of "outer space": a failure to think off planet

Astronauts often describe a profound shift in perspective and consciousness when they see Earth from space. This "Overview Effect," a term coined by author Frank White in his 1987 book *The Overview Effect: Space Exploration and Human Evolution*, manifests from a view back towards the planet – fragile, borderless, and suspended in the vastness of space – and often evokes a deep sense of awe, unity, and interconnectedness, along with a heightened awareness of Earth's vulnerability. Many astronauts report that this experience changes how they view humanity, borders, and environmental issues. For example, Edgar Mitchell, an Apollo 14 astronaut, described it as an "instant global consciousness."[11] It's not just a visual experience, but an emotional and philosophical one, that sticks with them long after they

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[7] Ibid, at s 6.3.2.
[8] *Montevideo Convention on the Rights and Duties of States* 165 LNTS 19, art 1.
[9] Jacob Caldwell, "Planetary Pandemonium: Legal Comparisons and Concerns Regarding SpaceX's Mars Colonization Claims" (2023) 22 Loy Mar L J 46.
[10] Elon Musk "The first Starships to Mars will launch in 2 years when the next Earth-Mars transfer window opens" (7 September 2024) X, https://x.com/elonmusk/status/1832550322293837833?lang=en.
[11] Edgar Mitchell and Dwight Williams, *The Way of the Explorer: An Apollo Astronaut's Journey Through the Material and Mystical Worlds* (Putnam, 1996) 86.

return. To fully grasp the fundamental flaw of space law, we need to follow the astronauts into space, but we must go further.

2.1.1 A Martian's perspective

Picture a Martian settler, boots sunk into rust-red dust, beneath a sky too thin to breathe unaided. She gazes upward, past the jagged rim of a crater her kin have called home for generations, to a pale blue dot glinting in the void. Earth is just another speck in the cosmic tapestry, no grander than Mars or Jupiter. Yet the *Outer Space Treaty* deems the blue planet unique: the sole celestial body exempt from its scope, where its nations carve borders and claim dominion. Why, she wonders, does that remote blue fleck, a mere planet like hers, hold such sway over her red horizon?

Now imagine that a water tank – lifeblood in this arid expanse – is stolen from her family. Her dispute drifts across millions of kilometres to an Earthly court, of which any number of sovereign countries could have jurisdiction over her habitation. Why is Mars, her home, branded as "outer space" in a treaty drafted by Earthlings who've never tasted its dust? This is no quirk of law, but a geocentric bind, tethering Martian lives to Earth's legal orbit. Forged when space was a frontier, not a habitat, the OST embeds a flaw as old as Ptolemy: Earth as the centre of the legal universe, a relic unfit for humanity's off-planet future.

2.1.2 Interpreting "outer space" in the Outer Space Treaty

The OST's geocentric flaw stems from its undefined term "outer space," which can only be interpreted from an Earth-based perspective 'looking out' at space. We can reach this conclusion by looking at the treaty text. Earth itself is excluded from the treaty's provisions. Article II provides: "*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*." The prevailing interpretation[12] designates all areas beyond Earth's atmosphere – typically above the Kármán line at 100 km – as outer space, encompassing every celestial body except Earth. This interpretation – called the geocentric model – is centred around the Earth; the Earth is the only point in the universe that is "exospatial," or outside the defined scope of outer space.[13]

[12] Zach Miller, "Great Unknown" (2018), above n 2, at 357.
[13] Ibid, at 359.

Under this geocentric model, Article II permits sovereign claims to persist exclusively on Earth. Article I reinforces this, designating outer space as *res communis* – "the province of all mankind" – separate from Earth's divided nations. Consequently, Article VI mandates that all space activities remain subject to Earth states' supervision. This framework assumes Earth's jurisdictional primacy (Art VIII), a position inconsistent with its cosmic equivalence to other bodies. For the Martian, this is incoherent. If Earth dwells in the cosmos, why does it escape the non-appropriation rule that binds her world?

2.2 The Celestial Subjectivity Model: a cosmic shift and a view from up the well

To understand the solution, Earth lawyers, anchored in our legal well, must ascend to see our planet from another perspective. We need to start thinking about gravity wells. A gravity well denotes the region dominated by a body's gravitational force. Imagine a cosmic dip in the 'fabric' of space, like a bowling ball placed on a stretched rubber sheet. The heavier the object (like a planet or a star), the deeper the dip, pulling nearby things – like marbles – towards it. That is how gravity keeps moons orbiting planets and planets orbiting stars as they continuously fall towards the bottom of the well. Going down the well means moving closer to the heavy object where gravity's pull gets stronger. Climbing back out of that dip takes more energy, like a rocket escaping Earth's gravity to reach space.

2.2.1 A Belter's perspective

In *The Expanse*,[14] a science-fiction saga where humanity has colonised the solar system, 'Belters' – born in the asteroid belt's microgravity – call Earthers and Martians "Inners," as in those who dwell in oppressive gravity wells. To a Belter, Earth's crushing pull isn't home but a death sentence. Going "down the well" is a visceral burden their weaker bodies cannot endure, while "up the well" marks their native void. Where Earthers see outer space as "off planet," Belters see gravity as the divide – cultural and physical – splitting humanity's identity. The Belter has no experience of what it's like to live on a planet. Their home is outer space itself. The architects of the *Outer Space Treaty* never comprehended space as a home. They embedded this geocentric fallacy into its non-appropriation rule and crowned Earth sole sovereign, a pale blue dot lording over the cosmos. This supremacy breeds tension: Belters strain against a law blind to their reality.

2.2.2 Redefining "outer space"

[14] James S.A. Corey, *The Expanse* (Orbit Books, New York, 2011–2021).

The Celestial Subjectivity Model, proposed by legal scholar Zach Miller, redefines outer space as: "*the space outside a celestial body's gravity well relative to a state's presence and perspective on that body*."[15] The CSM would allow for colonies to evolve into independent sovereign states (see s 4.2) on celestial bodies. For an Earth-based state, "outer space" includes Mars, the Moon, and all beyond Earth's gravity well, with Earth excluded. For a state on Mars, "outer space" includes Earth and all beyond Mars' gravity well, with Mars excluded. Likewise, for a state on the asteroid Ceres.[16] This relativistic approach, where "outer space" varies by a state's location positions each celestial body with a state presence as its own legal reference point. Earth loses its singular exemption and is classified as a celestial body equivalent to others, subject to identical spatial treatment from an external perspective.

2.3 Conclusion on the conceptual flaw of outer space

As we have seen, space law's concept of "outer space" has a fatal flaw. The current geo-centric model positions Earth as exospatial – outside outer space – granting it sole dominion over human civilization, no matter how far we spread into the cosmos. This contradiction will glare at future space-dwelling humans. Yet we can pivot. The Celestial Subjectivity Model offers a Copernican shift, making "outer space" relative and fixing a historical bias to fit a cosmos humans call home. Beyond resolving this flaw, CSM can reshape a legal framework ill-equipped for permanent space settlement.

3 Practical challenges to space law

3.1 SpaceX's legal challenge: an early test of the Outer Space Treaty

In November 2020, Elon Musk's SpaceX, included a striking provision in its Starlink service terms, igniting debate among space law scholars:

> *"For Services provided on Mars, or in transit to Mars via Starship or other colonization spacecraft, the parties recognize Mars as a free planet and that no Earth-based government has authority or sovereignty over Martian activities. Accordingly, Disputes will be settled through self-governing principles, established in good faith, at the time of Martian settlement."*

[15] Zach Miller, "Space Settlement" in Froehlich, above n 4, at 6.3.2.
[16] Ceres is the largest asteroid or 'dwarf planet' located in the asteroid belt between Mars and Jupiter, roughly the size of Texas.

Some scholars viewed this as SpaceX hinting at declaring Martian sovereignty through colonisation,[17] a stance seeming at odds with the *Outer Space Treaty*. However, Article II declares Mars, "not subject to *national* appropriation," leaving the status of non-state claimants ambiguous, which some call a potential "loophole" for private entities to claim ownership of space resources.[18] Most scholars disagree that such an interpretation is consistent with the treaty viewed as a whole,[19] despite evolving state practice.[20] Article IV mandates that states are responsible, and Article VII says states must ensure compliance for their national activities, space objects and people, including non-governmental entities. Article VIII grants states jurisdiction over objects and personnel on celestial bodies, implying ownership of structures rather than land. As SpaceX's state of incorporation, launch state, and registry state, the U.S. bears liability for damages[21] and jurisdiction over assets.[22] A Martian colony could claim structures, but even they are required to be open to shared access (Art XII). SpaceX's "free planet" declaration is clearly in violation of the OST, but perhaps the more interesting point is that they made it anyway.

3.2 Needs of permanent space settlement

The establishment of permanent human settlements in outer space demands far more than the transient infrastructure suited to short-duration scientific voyages, small research stations, or tourism centres. To ensure survival in the harsh extraterrestrial environment, settlements will need to appropriate and utilise local resources – such as water ice, minerals, and regolith – for sustenance, construction, and energy production.[23] Beyond mere survival, the thriving and growth of a permanent human presence require legal frameworks to support complex societal

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[17] Caldwell, "Planetary Pandemonium" (2023), above n 9; Cristian van Eijk, *Sorry, Elon: Mars is Not a Legal Vacuum – and It's Not Yours, Either*, Völkerrechtsblog (5 November 2020) https://voelkerrechtsblog.org/sorry-elon-mars-is-not-a-legal-vacuum-and-its-not-yours-either/.

[18] Srivats Shankar, "Fresh Start for the Fourth Planet: An Economic Perspective on the Habitation of Celestial Bodies" (2017) 42 Ann Air & Space L 341 at 354; Caldwell, "Planetary Pandemonium" (2023), above n 9, at 61.

[19] Cristian van Eijk, "Sorry, Elon" (2020), above n 16.

[20] See United States and Luxemburg for examples of domestic law permitting private resource rights for asteroid mining: Christopher D Johnson, *The Outer Space Treaty and the Evolution of State Practice in Space Law*, Proceedings of the International Institute of Space Law 2020 (Eleven International Publishing, 2021) 3.

[21] Outer Space Treaty, Article VII, above n 1; *Convention on International Liability for Damage Caused by Space Objects* 961 UNTS 187 (opened for signature 29 March 1972, entered into force 1 September 1972), art 7.

[22] Outer Space Treaty, Article VIII, above n 1; *Convention on Registration of Objects Launched into Outer Space* 1023 UNTS 15 (opened for signature 14 January 1975, entered into force 15 September 1976), art 2.

[23] Christopher D Stomberg and Travis S Barham, *Mars In Situ Resources and Utilization for Human Settlement*, Search and Discovery (15 April 2019).

structures, encompassing property and resource rights, land tenure, and the development of private habitations. These elements are essential to incentivise the massive investment required to colonise celestial bodies, enable economic activity, and provide settlers with the certainty needed to establish self-sustaining communities. Unlike exploratory missions reliant on Earth-based supply chains, permanent settlement envisions a shift towards autonomy, where land and resource rights become indispensable for transforming outer space into a viable domain for human habitation.

3.3 Gaps in the OST framework

The *Outer Space Treaty*, forged in the Cold War era, is fundamentally ill-suited to address the practical exigencies of permanent human settlement, as its framework prioritises state actors and the prevention of geopolitical conflict over resource dominance and territorial power. Designed to prohibit national appropriation of outer space, the treaty's broad proscription – extending to appropriation "by any other means" – effectively bars private entities from asserting exclusive resource extraction rights or establishing proprietary claims over extraterrestrial land, thus stymieing the development of space-based civilisation. This reveals a structural flaw, rendering it inadequate to govern the dynamic needs of permanent human habitation and resource utilisation in outer space.

3.4 Cooperative sovereignty on the ISS: a case study

The International Space Station (ISS) provides a practical lens for examining current space law, particularly the concept of cooperative sovereignty as articulated by scholars.[24] Governed by the Intergovernmental Agreement[25] (IGA), the ISS consists of modules owned by partner states, each required to register and retain authority over its segments and crew. A Russian cosmonaut in the US module, for instance, remains subject to Russian law, while the module falls under US jurisdiction. The IGA prioritises compliance with the OST, allowing states to apply national laws – spanning criminal, family, property, and ethical matters – to their personnel. This creates a jurisdictional patchwork sustained by Earth's proximity, exemplifying how nations collaborate in orbit, bolstered by the OST's focus on shared access.[26] Yet it invites scrutiny of its limits beyond Earth's reach.

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[24] Caldwell, "Planetary Pandemonium" (2023), above n 9, at 62.
[25] *Agreement Among the Government of the United States*... [1998] 2177 UNTS 163
[26] Outer Space Treaty, Article XII, above n 1.

3.5 The legal labyrinth of cooperative sovereignty on mars

Extending the ISS cooperative sovereignty model to a Martian colony confronts the non-appropriation principle. A pragmatic solution[27] might offer colonising states or private companies "bounded first possession," exclusive economic rights to resources within designated zones, preserving access for others. Internationally managed planetary parks, overseen by a Mars Secretariat, could safeguard sites of scientific or cultural value, with their boundaries set by global consensus of Earth-states. Yet, the reality of conditions on Mars tests this approach. On Mars there will be communication delays of up to 24 minutes[28] and months-long resupply gaps in contrast with the ISS's near-instant oversight. Private actors – recall SpaceX's Starlink clause – might resist control from distant states, while disputes over scarce resources risk tension. This balance of development and preservation under this model rests on Earth's jurisdictional hold, a fragility hinting at deeper governance flaws.

Earth based jurisdiction on Mars further tangles this model. Under Article VIII, states register habitats and retain authority over them and their nationals, avoiding territorial claims that violate Article II. A Chinese colonist in a US habitat, for instance, remains under Chinese law while the habitat remains under US jurisdiction, an arrangement feasible in orbit but fragile on Mars. Applying Earth's laws in a Mars context directly, risks implying land rights or sovereignty. What will be needed is a bespoke legal order for colonies, akin to historical terrestrial expansions, tailored to local environmental and social demands. This Earth-tethered jurisdiction can support initial settlement but weakens as a long-term solution as the settlement grows.

3.6 Why would a Martian dream of an independent state?

The transition from a small scientific outpost to a fully-fledged Martian civilisation represents a natural progression, shifting from mere jurisdictional oversight by Earth-based authorities to claims of sovereignty rooted in the will of a distinct populace. A large-scale Martian settlement will have its own governmental hierarchy, fostering shared cultural values, social structures, and a nascent identity that render mere jurisdictional control under the cooperative sovereignty model insufficient. Real sovereignty entails the right to self-determination, requiring an authoritative structure infused with the settlers' collective will to be self-

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[27] Sara Bruhns and Jacob Haqq-Misra, "A Pragmatic Approach to Sovereignty on Mars" (2016) 38 Space Pol'y 57.

[28] NASA Mars Exploration Program, *Communications with Earth*, Mars.NASA.gov (23 August 2022) https://mars.nasa.gov/msl/mission/communications/.

governed. As Elon Musk's vision of Mars as a "free planet" suggests, settlers may eventually seek to break free from colonial oversight. Under the *Montevideo Convention*,[29] a Martian society with a permanent population, defined territory, and local government could assert statehood, yet its capacity for international relations remains constrained by Earth's dominance, highlighting the impetus for independence.

3.7 A source of conflict?

The OST bans sovereign claims over celestial bodies, tethering Martian settlements to Earth's jurisdiction and state responsibility. This Earth-centric design, intended to prevent resource disputes among nations, paradoxically risks igniting conflict as a Martian civilisation seeks self-determination, an aspiration the OST neither anticipates nor accommodates. It offers no mechanism to recognise extraterrestrial societies asserting autonomy, nor does it clarify private rights to exploit and trade resources. Mars' isolation amplifies this misalignment, echoing historical colonial divergences like the American Revolution. Without reform, settlers face a binary choice: compliance with Earth's courts or defiance, potentially escalating tensions if Earth enforces primacy. The *International Covenant on Civil and Political Rights*[30] affirms self-determination, yet Article VI blocks *Montevideo* statehood by mandating state oversight. History suggests that such suppressed aspirations, constrained by an unyielding legal framework, may precipitate conflict, underscoring the urgent need for space law to evolve beyond its naïve origins. Solving this issue will not be as simple as removing the prohibition on national appropriation, nor do we want to. As already mentioned, the most essential term in Article II is "outer space." The Celestial Subjectivity Model will allow for the development of civilisation by re-interpreting the non-appropriation principle through the appropriate lens.

4 The CSM solution: re-interpreting the non-appropriation principle

Under our new definition of outer space, the essence of Article II changes to provide that "*no nation may claim any body of matter in the universe outside of the gravity well of the celestial body on which that nation exists*."[31] This new rule accomplishes the same principle behind the original: preventing conflict between states by disallowing state competition for space

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[29] *Montevideo Convention on the Rights and Duties of States* 165 LNTS 19, art 1.
[30] *International Covenant on Civil and Political Rights* 999 UNTS 171 (opened for signature 16 December 1966, entered into force 23 March 1976), art 1.
[31] Zach Miller, "Space Settlement" in Froehlich, above n 4, at s 6.3.2.

resources. However, it would permit local sovereignty to emerge: a self-sustaining Martian settlement with governance may establish sovereignty within Mars' gravity well, forming an independent state. This redefined legal framework authorises settlements on celestial bodies to establish jurisdiction within their gravity wells, transferring legal authority from Earth's sole control to a localised framework for the newly sovereign state. It resolves the OST's inconsistency – Earth as the only body permitting sovereignty – by aligning space law with the physical reality that all celestial bodies, including Earth, share equal cosmic status.

4.1 Self-determination and sovereignty

A settlement achieves sovereign independence when it emerges as a self-sustaining settlement which takes on the attributes of "civilisation."[32] This happens when it satisfies the *Montevideo Convention on the Rights and Duties of States* (Article 1) criteria:

(a) a permanent population (multi-generational settlers);

(b) a defined territory (within its gravity well);

(c) a government (self-sustaining administration); and

(d) capacity to enter into relations with other states, evidenced by autonomous political will – such as a unique identity, culture, and political expression.

4.2 The revised framework

The OST imposes a universal ban on appropriation, preserving celestial bodies as *res communis* domains under Earth states' supervision. Whereas CSM distinguishes between Earth-based appropriation and local sovereignty, enabling a Martian settlement to attain statehood rather than remain an outpost of Earth. This enables for the natural progression of a Martian settlement – under the auspices of US jurisdiction – to develop into a unique civilisation when sovereignty becomes ripe for expression into an independent Martian state. The US and its entities, now prohibited from retaining sovereign territory on Mars, can continue to mine resources and trade with the new Martian state in good faith.

4.2.1 Application to non-habitable asteroids and moons

[32] Ibid, at s 6.6.3.

Our new definition of "outer space" treats each celestial body's gravity well as distinct, even for moons like Luna[33] or Phobos[34] orbiting a larger gravity well (their planet). CSM distinguishes celestial bodies into two classes based on their potential for sovereignty under the *Montevideo Convention*. Habitable bodies – like Mars or Ceres – possess the capacity for self-sustainability and a unique cultural identity, marking them as protected bodies where settlers must anticipate eventual statehood within their gravity wells. In contrast, resource-oriented bodies such as Luna, unlikely to diverge from Earth due to proximity and dependence, or small asteroids like Vesta,[35] too limited for permanent habitation, face no such prospect. Miller advocates unrestricted appropriation of resources on these latter bodies,[36] allowing states and private entities to extract without reserve. While habitable bodies demand caution, as their settlers could claim sovereignty, shifting control from foreign state to local hands.

4.2.2 Legal implications

The potential for private ownership of territory on celestial bodies, and self-governance within its gravity well, overcomes the current OST framework's barrier to permanent settlement outside earth. It upholds the treaty's aim to prevent conflict among states with a bespoke legal framework, that enables a peaceful expansion allowing new states to emerge. Clearly defined sovereignty and resource rights will mitigate disputes between entities already familiar with the rules. It will reduce the risk of conflict because all entities will understand that a sovereign state may emerge here in the future, encouraging peaceful exploration and settlement from the beginning of the colonisation process. States will not be competing for sovereign territory or permanent control of resources on celestial bodies. For example, colonising state and private entities will hope to interact with the Martian state for Martian resources. They will still be able to acquire resources but will compete peacefully for deals with the Martian state.

5 Equality of celestial states

The Celestial Subjectivity Model redefines "outer space" and reinterprets the non-appropriation principle to establish legal equality among celestial and terrestrial states.

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[33] Earth's moon, commonly called "Luna" in scientific and Latin-derived contexts.
[34] Phobos is the Martian moon.
[35] Vesta is the second biggest asteroid in the asteroid belt, roughly the size of Great Britain.
[36] Zach Miller, "Space Settlement" in Froehlich, above n 4, at s 6.3.2.

Equality under CSM extends to economic and diplomatic relations. Earth states cannot appropriate extraterrestrial territory and must negotiate with sovereign space states for resources. For example, a Martian state may trade minerals directly rather than through Earth intermediaries. This parity diminishes Earth's historical privilege as sole appropriator, promoting diplomacy over dominance. The model's scalability applies this principle of equality to all celestial bodies – Mars, habitable asteroids like Ceres, or moons with settlement potential like Callisto[37] – ensuring no state exerts supremacy. By distinguishing resource-oriented bodies (Luna, Vesta) for private appropriation from habitable ones capable of statehood, CSM allows for the development of a legal framework to reduce disputes but encourage and foster the innovation of civilisation through the cosmos.

Emerging proposals, such as a "Martian Agreement,"[38] aim to govern Martian colonies. Any such framework, however, must address the OST's fundamental flaw and provide an equal celestial states based framework in the vision of SpaceX's "free planet" ideal. Without this shift, a "Martian Agreement" risks entrenching inequality and subordinating Martian settlers to Earth's legal orbit. CSM principles are scalable to humanity's ambitions. Further into the future, equality of celestial states can be the basis for a supplementary Cosmic Charter, modelled on the *Chicago Convention on International Civil Aviation*[39] for space transit and operations, regulation of trade, travel, and disputes among space states. For example, this would allow a Martian state to negotiate mineral exports as an equal. The legal framework developed by sovereign celestial bodies needs to ensure the rights of private entities to be integrated and aligned with state equality to prevent legal fragmentation. This would ensure that space law evolves into a system where all nations, terrestrial or celestial, operate on an equal footing. This can reduce the risk of conflict and encourage cooperation to meet the OST's peaceful intent in a multiplanetary era.

6 Recommendations for space lawyers

Human settlement of outer space – self-sustaining civilisations beyond Earth – looms closer with Elon Musk's plan to launch uncrewed Starships to Mars in late 2026, yet global legal discourse lags, dismissing it as a distant concern. History warns that effective laws anticipate

[37] Callisto is one of Jupiter's four Galilean moons and one of the best prospects for permanent human settlement.
[38] Annette Froehlich (ed), *Assessing a Mars Agreement Including Human Settlements* (Springer International Publishing AG, Cham, 2021).
[39] *Convention on International Civil Aviation* 15 UNTS 295 (opened for signature 7 December 1944, entered into force 4 April 1947).

change; the *Outer Space Treaty*, blind to off-planet habitation, falters under this impending reality. Space lawyers should seize this moment to reshape the legal framework, using the Celestial Subjectivity Model to correct its geocentric bias. The following recommendations offer concrete steps to ensure space law evolves before settlements outpace it, averting the conflicts born of past shortsightedness.[40]

Space lawyers should draft pre-emptive legal templates, such as a Martian Agreement grounded in CSM principles. These documents would outline sovereignty transitions, resource rights within gravity wells, and dispute resolution tailored to celestial states equality. By preparing these adaptable frameworks now, lawyers can provide settlers with ready-to-adopt governance tools, preventing the chaos of legal vacuums as colonies emerge on Mars or beyond.

Engaging private sector pioneers is critical. Lawyers should initiate dialogues with SpaceX and similar entities, aligning their plans – like the 2026 Mars missions – with CSM's vision of future statehood. Drafting voluntary codes of conduct that respect celestial equality and OST compliance could bridge the gap between corporate ambition and international law, ensuring companies like SpaceX bolster, rather than undermine, a multiplanetary legal order.

To force global action, lawyers should lobby for an International Space Law Summit by 2027, post-Musk's uncrewed landings. This forum would confront the OST's flaws head-on, using CSM to negotiate a Martian Agreement that redefines "outer space" relativistically and sets sovereignty precedents. Proactively securing state buy-in before settlements scale up could pre-empt resistance from powers like the US, China, or Russia.

Educating lawmakers demands urgency tied to tangible triggers. Space lawyers should produce briefings linking SpaceX's "free planet" stance and 2026 launches to the need for reform, drawing parallels to colonial legal lags – like the American Revolution – that sparked conflict. These accessible narratives can jolt legislators into recognising that the multiplanetary era requires action now, not decades hence.

CSM will need to be refined by addressing practical interactions between distinct gravity wells and establishing a clear classification framework. There are still practical questions about shared spaces, such as orbits or regions where gravity wells interact, that can pose

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[40] Paul Meyer, "Only Effective Space Governance Can Prevent Future Conflict" (Centre for International Governance Innovation, 23 January 2024) https://www.cigionline.org/articles/only-effective-space-governance-can-prevent-future-conflict/.

disputes. A Martian satellite, for instance, lies within Mars' well from a settler's view, but the US might claim jurisdiction if it launched the craft. Lawyers should develop an arbitration body to resolve these conflicts, ensuring equality among celestial states isn't blurred by overlapping claims.

Finally, space lawyers should create a framework to categorise bodies into habitable ones, where self-sustainability and unique identity signal potential sovereignty, and resource-oriented ones, open to unrestricted appropriation due to their limitations for human habitat. This dual categorisation approach clarifies jurisdictional boundaries and guides colonisation, aligning CSM with the reality of a multiplanetary future.

7 Conclusion

The *Outer Space Treaty* chains humanity to an Earth-centric past, crowning our pale blue dot as the cosmos' sole sovereign – a flaw that falters as we reach for the stars. The Celestial Subjectivity Model offers the remedy: a Copernican leap redefining "outer space" beyond each gravity well, equalising Earth with Mars, Ceres, or any celestial body settlers call home. This shift redefines how we perceive the universe from a legal perspective, essential to our identity as a multiplanetary species; just as the universe is not geocentric, nor should our laws be. With uncrewed SpaceX Starships set for Mars in 2026, this evolution is no distant dream but an imminent need. CSM offers stability and equity, distinguishing habitable cradles of sovereignty from resource-rich zones open to extraction. It crafts a legal order where Mars might rise as a state while Luna fuels Earth's needs, guiding colonisation with foresight. Building toward human settlement across the solar system and beyond, this perspective centres not on one world but on human civilisation itself.