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THE OUTER SPACE TREATY AS A CONSTITUTION WITHOUT A GOVERNMENT (1ST ED. 2025)

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Abstract

The Outer Space Treaty of 1967[115] is frequently described as the "Constitution of Outer Space"[116] as this treaty was the foundational principles for the peaceful exploration and use of space[117]. However, much like a constitution without an implementing government, the Treaty articulates ideals without providing the institutional mechanisms, enforcement frameworks, or detailed protections necessary to address the complex realities of 21st-century space activity and neglecting fundamental rights aspect. This paper will get into depth of that while the Outer space Treaty was a landmark achievement and advancement towards Space exploration laws[118] in its time but its broad principles fail to address pressing modern challenges including environmental accountability[119], private sector regulation, protection of individual rights, and effective dispute resolution[120]. Drawing on comparative constitutional analysis and current space governance debates, the paper proposes a modernized enforcement architecture for space law[121], capable of safeguarding both the shared interests of the international community and the rights of individuals[122] affected by space activities.[123]

[115] 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, entered into force 10 October 1967) 610 UNTS 205 (Outer Space Treaty).
[116] Stephen Gorove, 'The United Nations and the Outer Space Treaty' (1967) 61(4) AJIL 858.
[117] UN Committee on the Peaceful Uses of Outer Space (COPUOS), *Report of the Legal Subcommittee on its Fifty-Ninth Session* (2020) UN Doc A/AC.105/1227.
[118] Stephan Hobe, 'The Current Status of International Space Law' (2007) 11 German LJ 821.
[119] *Certain Activities Carried Out by Nicaragua in the Border Area* (Costa Rica v. Nicar.), Judgment, 2015 I.C.J. Rep. 665 (useful for environmental liability analogy).
[120] PJ Blount, 'Innovative Institutional Designs for Space Governance' (2017) 113 AJIL Unbound 111.
[121] FABIO TRONCHETTI, **FUNDAMENTALS OF SPACE LAW AND POLICY** (2013).
[122] Henry Hertzfeld, Christopher Johnson and Brian Weeden, 'Private Human Access to Space: Business, Policy, Law, and Regulation' (2015) OECD Space Forum Working Paper.
[123] U.N. Comm. on the Peaceful Uses of Outer Space, Guidelines for the Long-term Sustainability of Outer Space Activities, U.N. Doc. A/74/20 (2019).

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Introduction

When the Outer Space Treaty entered into force in 1967, it was hailed as a diplomatic triumph. Negotiated in the midst of the Cold War[124] and to end the race and competition to the space, it bridged ideological divides to affirm that space belonged to all humankind, should be used for peaceful purposes, and would not be subject to national appropriation. For decades, it has provided the guiding principles for space activity, earning its reputation as the "Constitution of Outer Space."[125]

Yet a constitution, in any legal sense, is more than a set of rules ad wording, it is a framework for governance and regulations. A national constitution may outline fundamental principles, but it also establishes institutions, defines powers, and guarantees rights. The Outer Space Treaty by contrast, offers only the first part of this equation. It sets out broad commitments, but is silent on critical details such as Who adjudicates disputes between states? What constitutes "damage" and how is liability assessed? How are environmental harms addressed and remediated? What consequences should follow from a failed or negligent mission? How are the rights of citizens including right to privacy, astronauts, space workers, and those affected by accidents to be protected?

These gaps were understandable in 1967, when it was a beginning of space activity as it was a new subject area in the turning point to modern era and was the exclusive domain of two superpowers, and the primary concern was avoiding militarization and weaponization.[126] But in today's reality of commercial spaceflight, private sector resource exploitation, surveillance and mounting space debris, the absence of detailed regulatory mechanisms leaves both states and individuals exposed. Treaties[127] like the Liability Convention[128], the Registration Convention[129], and the Rescue Agreement[130] fill some technical gaps, but together they still fall short of forming a coherent, enforceable governance regime and as mentioned earlier Outer Space Treaty is the main piece of legislation, instead of being fragmented across multiple treaties, these provisions could have been addressed in a single comprehensive instrument.

If the Treaty is truly to be the constitution of space, it must evolve into a framework that combines principled commitments with robust institutions, clear legal definitions, and enforceable rights. This paper explores how that transformation might take place, drawing lessons from national constitutions, examining existing space law[131] instruments, and proposing a modern enforcement framework capable of addressing the governance vacuum in outer space[132].

Part I: - What the Outer Space Treaty Says and What It Omits

The Outer Space Treaty is organized into a series of brief articles, each stating a core principle. While these provisions have shaped decades of space activity, their brevity leaves major interpretive and operational gaps. The following analysis outlines the treaty's main commitments alongside the key omissions that limit its effectiveness as a comprehensive governance instrument.

Article I, Freedom and Benefit of Space Exploration, what it says; - Space exploration must be carried out for the benefit of all countries[133], irrespective of economic or

[124] Paul Dembling and Daniel Arons, 'The Evolution of the Outer Space Treaty' (1967) 33 J Air L & Com 419.
[125] Bin Cheng, *Studies in International Space Law* (Clarendon 1997).
[126] Anti-satellite Weapons, Deterrence and Sino-American Space Relations
[127] FRANCIS LYALL & PAUL B. LARSEN, **SPACE LAW: A TREATISE** (2d ed. 2018).
[128] Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187.
[129] Convention on Registration of Objects Launched into Outer Space (opened for signature 14 January 1975, entered into force 15 September 1976) 1023 UNTS 15..
[130] Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (opened for signature 22 April 1968, entered into force 3 December 1968) 672 UNTS 119.
[131] Bin Cheng, *Studies in International Space Law* (Clarendon Press 1997).
[132] Bin Cheng, 'The Legal Regime of Airspace and Outer Space: The Boundary Problem' (1965) 5 International and Comparative Law Quarterly 23.
[133] Frans von der Dunk, *International Space Law* (Cambridge University Press 2015) 84–87.

scientific development. Space is free for exploration and use by all states, and is not subject to national ownership.

What it omits**:** No mechanism to determine whether a particular mission genuinely benefits "all countries." What can be consider or defined as "benefit". No process for resolving disputes when one state alleges another's activities are exclusionary or harmful. No protection for equitable access in the face of commercial monopolization.

Article II, Non-Appropriation Principle, what it says: Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, use, occupation, or other means.

What it omits: No definition of "appropriation" in the context of resource extraction[134]. No clarity on whether private entities may own resources extracted from space. No enforcement body to challenge violations.

Article III, Peaceful Use and International Law[135], what it says: - Activities in space must be conducted in accordance with international law, including the UN Charter, and for peaceful purposes.

What it omits: No clear definition of "peaceful"[136] in the context of dual-use technology (e.g., satellites with both civilian and military functions). No mechanism for investigating or adjudicating alleged violations and what can be discussed as peaceful when modern wars[137] are mostly using space.[138]

Article IV, Ban on Weapons of Mass Destruction, what it says: - Prohibits placing nuclear[139] weapons or other weapons of mass destruction in orbit, on celestial bodies, or otherwise stationing them in space.

What it omits: No mention of conventional weapons. No verification regime to ensure compliance. No penalties for violations hence creating uncertainties for example NASA's use of nuclear power systems, refers as the *Kilopower Project*[140] a small nuclear reactor intended for lunar or Martian bases but again such things need to be under proper scrutiny of the States party to Outer Space treaty.[141]

Article V, Astronauts as Envoys of Mankind, what it says: Astronauts shall be regarded as "envoys of mankind" and assisted by all states in case of distress.

What it omits: No detailed rescue procedures beyond the general obligation (later elaborated in the Rescue Agreement). No provisions for astronaut safety standards or liability for harm caused by negligence. No reference to the rights of astronauts as individuals.[142]

Article VI, Responsibility for National Activities, what it says**:** - States are internationally responsible for national space activities, including those by non-governmental entities, and must authorize and continually supervise such activities.

What it omits: No definition of "authorization" or "supervision." No minimum standards for licensing private operators. No independent oversight to verify compliance.

Article VII, Liability for Damage, what it says: - States are liable for damage caused by their space objects to other states or their property.

What it omits: No definition of "damage" within the Outer Space Treaty (addressed later in the Liability Convention,[143] but still narrow). No provisions for environmental harm or long-term

[134] Fabio Tronchetti, *The Exploitation of Natural Resources of the Moon and Other Celestial Bodies* (Martinus Nijhoff 2009).
[135] Frans von der Dunk, *International Space Law* (Cambridge University Press 2015).
[136] Stephan Hobe, 'Peaceful Uses of Outer Space and the Dual-Use Dilemma' (2015) 60 Proceedings of the IISL 389.
[137] Bleddyn Bowen, *War in Space: Strategy, Spacepower, Geopolitics* (Edinburgh University Press 2020).
[138] Valerie Insinna, 'How Pakistan's Kill Chain Gave It the Edge Over India in Air Battle' *Air & Space Forces Magazine* (13 March 2025) https://www.airandspaceforces.com/india-pakistan-air-battle-kill-chain/
[139] *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, 1996 I.C.J. Rep. 226 (general principle of environmental law in international law).

[140] National Aeronautics and Space Administration (NASA), 'Kilopower: Small Nuclear Reactor for Deep Space Exploration' (2018) https://www.nasa.gov/directorates/spacetech/kilopower/ accessed 16 August 2025.
[141] https://www.nasa.gov/news-release/demonstration-proves-nuclear-fission-system-can-provide-space-exploration-power/
[142] International Space Law: United Nations Instruments
[143] Convention on International Liability for Damage Caused by Space Objects (opened for signature 29 March 1972, entered into force 1 September 1972) 961 UNTS 187.

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degradation of the space environment. No direct remedy for individuals' claims must be brought by states.

Article VIII, Jurisdiction and Control, what it says: - A state retains jurisdiction and control over its space objects and personnel, even if they are in outer space or on another celestial body.

What it omits: No mechanism for resolving overlapping jurisdiction claims. No rules for handling abandoned or derelict spacecraft.

Article IX, Avoidance of Harmful Contamination, what it says: - States must avoid harmful contamination of space and celestial bodies and avoid adverse changes in Earth's environment from space activities.[144]

What it omits: No standards for what constitute "harmful contamination." No enforcement or remediation mechanisms. No environmental liability provisions.

Articles X–XII, Transparency, Observation, and Cooperation, what they say:- States should promote transparency in space activities, allow other states to observe launches, share information, and cooperate for mutual benefit.

What they omit: No mandatory information-sharing standards. No dispute resolution if states refuse access. No confidentiality protections for shared technical data.

Summary of Omissions: The Outer Space Treaty strength lies in its broad principles; its weakness lies in the absence of definitions, enforcement bodies, penalties, and individual rights protections. Subsequent treaties the Liability Convention (1972), Registration Convention (1975), and Rescue Agreement (1968) fill some gaps and loopholes but still fail to create a fully functional governance system and left the cracks in the system. As a result, critical issues such as environmental harm, commercial exploitation, and private sector regulation remain largely addressed through national laws, creating a fragmented and inconsistent global framework.

Part II – Why These Omissions Matter in Modern Space Activity

When the Outer Space Treaty was drafted in the mid-1960s, as mentioned earlier that Space was exclusive domain of two superpowers. Missions were few, state-funded, not any private sectors and primarily symbolic. The treaty's framers could not have anticipated today's space environment one characterized by private mega-constellations, commercial lunar mining plans, reusable heavy-lift rockets, and increasing environmental scrutiny. The absence of detailed rules in the Outer Space Treaty now creates legal uncertainty, fragmented regulation, and growing geopolitical tension as per the growing demand.

1. Commercial Spaceflight and Liability Uncertainty: - Private companies such as SpaceX,[145] Blue Origin, and Rocket Lab are conducting regular launches, often on timelines and scales surpassing national space agencies.[146]
   Outer Space Treaty Gap: While Article VI makes states responsible for private actors, it does not specify how supervision should work or set liability standards for damage in space but in April 2023, SpaceX's Starship[147] test caused debris fallout and a wildfire in Texas.[148] The FAA's environmental review[149] was challenged in US courts[150], but internationally, no mechanism exists to hold a state accountable for transboundary environmental harm from a launch especially when environmental issues are center of discussion due to Global Warming and other disasters, therefore such incidents

[144] UN COPUOS, *Space Debris Mitigation Guidelines* (A/62/20, Annex).

[145] U.S. Fish & Wildlife Serv., *Biological Opinion on the SpaceX Starship Program* 4–7 (2023).
[146] https://research.open.ac.uk/news/private-companies-are-launching-new-space-race-heres-what-expect
[147] Christian Davenport, 'SpaceX's Starship Test Launch Caused a Wildfire and Rained Debris on a Town' *Washington Post* (21 April 2023) https://www.washingtonpost.com accessed 16 August 2025.
[148] https://www.cnbc.com/2023/04/26/spacex-starship-explosion-caused-3point5-acre-fire-us-fws-says-
[149] FAA Final Programmatic Environmental Assessment (2022)
[150] CENTER FOR BIOLOGICAL DIVERSITY v. FEDERAL AVIATION ADMINISTRATION, 1:23-cv-01204, (D.D.C.)

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had transboundary consequences on the other States.

2. Environmental Harm in Space and on Earth the Outer Space Treaty's Article IX obligation to avoid "harmful contamination" lacks definitions and enforcement.

   That Gaps in outer Space Treaty has no binding global standard for space debris mitigation[151] or environmental impact assessment.

   Space debris incidents, such as the uncontrolled re-entry[152] of a Chinese Long March[153] 5B booster in 2022, risk harm to populated areas.[154]

   Satellite mega-constellations (e.g., Starlink, OneWeb) raise concerns about space traffic management, orbital crowding, and night-sky pollution all outside the scope of Space Treaty enforcement.[155]

3. Resource Extraction and the Non-Appropriation Principle: - With the Artemis[156] Accords[157] and national space resource laws (US, Luxembourg, UAE)[158], some states are moving toward recognizing private property rights over extracted space resources.[159]

   Although the Article II forbids national appropriation but is silent on private resource ownership, creating legal ambiguity.

   Thet conflicting interpretations could lead to resource conflicts on the Moon[160] or asteroids, without any binding dispute resolution forum.

4. Absence of Individual Rights Protection: - The Outer Space treaty treats states as the primary actors and ignores the direct impact of space activities on individuals.

   The Outer Space Treaty has no provisions for compensating individuals harmed by space activities, whether on Earth (e.g., debris impact, infringement of privacy) or in space (e.g., astronaut safety violations)[161].

   Under the Liability Convention, individuals must rely on their governments to bring claims, which may be politically or diplomatically constrained therefore impossible to bring such claims.

5. Weak Dispute Resolution Mechanisms: - Disputes under the Treaty are resolved diplomatically or, rarely, through the International Court of Justice if both parties consent. But it lacks to establish dedicated space law tribunal or permanent claims body.

   Disputes over satellite interference, space debris attribution, or lunar resource access are likely to become more frequent, but existing mechanisms are too slow and politically fragile to resolve them effectively.

6. Fragmented National Regulation: - Because the Outer Space Treaty leaves implementation to national law, space governance is uneven.

   These Gaps leave no minimum global standards for licensing, safety, or environmental review. "Regulatory havens" may emerge where companies operate from states with minimal

[151] United Nations Office for Outer Space Affairs, *Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space* (UN 2010).
[152] Steven Lee Myers, China's Rocket Falls Back to Earth, Stoking Space Debris Worries, *N.Y. Times* (May 9, 2021), https://www.nytimes.com.
[153] NASA Administrator Statement, May 2022.
[154] Andrew Jones, 'China's Long March 5B Rocket Stage Makes Uncontrolled Reentry' *SpaceNews* (31 July 2022) https://spacenews.com accessed 16 August 2025.
[155] Satellite Mega Constellations: Conflict between Freedom of Exploration and Unsustainable Outer Space Activities, 2025, **Varies Putro**
[156] US Department of State, *The Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids* (13 October 2020).
[157] Artemis Accords text (NASA, 2020); U.S. Commercial Space Launch Competitiveness Act (2015)
[158] UAE Federal Law No. 12 (2019).
[159] Bold steps forward: The investment impact of enacting space resources legislation. https://www.sciencedirect.com/science/article/pii/S0265964624000663#:~:text=Abstract,countries%20currently%20drafting%20similar%20legislation.

[160] Fabio Tronchetti, 'Property Rights on the Moon and Other Celestial Bodies' in Frans von der Dunk and Fabio Tronchetti (eds), *Handbook of Space Law* (Edward Elgar 2015).
[161] https://www.nasa.gov/hrp/hazards/

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oversight, undermining responsible actors.

Why this matters now: The pace of space activity is accelerating the number of active satellites has quadrupled in less than a decade, lunar missions are increasing, and private companie[162]s are investing billions in resource extraction technologies. Without an updated legal framework, gaps in the Outer Space treaty risk becoming points of conflict, environmental degradation, and inequitable access to space resources.

Part III — Lessons from National Constitutions[163] (and What Space Law Can Learn)

National constitutions are not merely statements of principle; they pair foundational norms with institutions, procedures, and remedies that make those norms real. Comparing the Outer Space treaty to modern constitutions reveals concrete design features that space governance lacks and that could be adapted to create an enforceable, rights-protecting, and sustainable framework for outer space.[164]

1. Principle + Implementation

Constitutions: Typically set out high-level rights and duties (e.g., freedom of movement, environmental protection) and then empower legislatures and agencies to adopt implementing statutes and regulations with concrete standards.
Lesson for space law: The Outer Space treaty's principles (peaceful use, non-appropriation, avoidance of contamination) need subsidiary, binding instruments model statutes or protocols that define terms (e.g., "harmful contamination"), set thresholds, and impose procedural duties (EIA, licensing, reporting).

2. Institutional Architecture

Constitutions: Create institutions (courts, regulatory agencies, ombudsmen) with defined powers and procedures to interpret, apply, and enforce the law.
Lesson for space law**:** A constitutional Outer Space treaty without institutions is hollow. Space governance requires at least one independent international authority (regulatory secretariat or tribunal) plus specialized agencies or panels for technical tasks (debris attribution, environmental review, licensing arbitration).

Possible institutional elements:

- International Space Regulatory Authority (ISRA): licensing standards, compliance monitoring, register of private operators.
- Space Environmental Protection Agency (SEPA): scientific thresholds, remediation orders, pollution liability assessments.
- Space Dispute Tribunal: a standing judicial or quasi-judicial body for timely adjudication.

3. Rights and Remedies

Constitutions: Recognize individual rights and provide judicial remedies (injunctions, damages, accountability).
Lesson for space law: Space governance should recognize the rights of affected persons (victims of debris impacts, workers, indigenous and global-south stakeholders) and create direct or delegated pathways for redress e.g., an international claims fund, expedited injunctive relief for hazardous operations, or standing rules allowing individuals/NGOs to seek relief through an international court or authorized national forum.

4. Clear Allocation of Competences

Constitutions: Define which level of government handles what competences and include conflict-resolution rules.
Lesson for space law: The Outer Space Treaty must be paired with rules that allocate competences between states, private actors, and an international authority. For example, states retain jurisdiction over objects but must

[162] Frans von der Dunk, 'Space for Tourism? Legal Aspects of Private Spaceflight for Tourist Purposes' (2011) 86 Chicago-Kent Law Review 421.
[163] Bruce Ackerman, *We the People: Foundations* (Harvard University Press 1991).
[164] Anne Peters, *Beyond Human Rights: The Legal Status of the Individual in International Law* (Cambridge University Press 2016).

cede certain supervisory powers (e.g., mandatory reporting, safety audits) to an international body when activities pose transboundary risks.

5. Accountability and Enforcement Mechanisms

Constitutions: Provide enforcement via penalties, judicial review, and mechanisms (impeachment, sanctions) to hold officials or agencies accountable.
Lesson for space law: The Outer Space Treaty lacks meaningful sanctions. A modern framework should include graduated enforcement tools: administrative fines, suspension of launch rights, mandatory remediation orders, and access to a dedicated liability insurance and compensation[165] pool for victims that operates independently of political diplomacy.

6. Transparency, Participation, and Due Process

Constitutions: Require transparent rule-making, public participation, and due process before depriving rights.
Lesson for space law: Space decisions with environmental or safety impacts (e.g., test launches, resource extraction approvals) should require public consultation, environmental impact assessments (EIA) published publicly, notice-and-comment procedures, and access to independent review.

7. Technical Evidence and Expert Bodies

Constitutions: Entrust complex technical questions to expert agencies or specialized courts (e.g., tax tribunals, environmental agencies).
Lesson for space law: Disputes about debris attribution, contamination, or scientific thresholds depend on evidence. The international framework should create accredited technical panels (scientific tribunals) whose findings bind the adjudicative body unless shown to be manifestly erroneous.

8. Flexibility and Amendment Procedures

Constitutions: Include amendment rules allowing constitutional evolution while guarding stability.
Lesson for space law: Any strengthened Outer Space Treaty architecture should include clear amendment/Protocol procedures and sunset/review clauses to adapt to technology, while ensuring broad participation and safeguards against capture by powerful states or corporations.

Part IV – Concrete Reform Proposals

If the Outer Space Treaty is to function as a true "Constitution of Outer Space," it must be supplemented by binding protocols that operationalize its principles, create permanent institutions, and establish enforceable rights and duties. The following proposals adapt best practices from national constitutional systems and international environmental regimes.

1. Protocol on Liability, Damage Definition, and Environmental Protection

Purpose: To clarify liability rules, define "damage," and create enforceable environmental protections.

Sample Treaty Language:

Article 1:- Definition of Damage
"Damage" shall include:
(a) Loss of life, personal injury, or impairment of health;
(b) Loss of or damage to property of States, natural persons, or legal entities;
(c) Environmental degradation, including contamination of outer space, celestial bodies, or the Earth's environment caused by space activities;
(d) Economic loss directly attributable to any of the above harms.

Article 2:- Standard of Liability
(1) States shall be absolutely liable for damage caused on the surface of the Earth or to aircraft in flight.
(2) States shall be liable on a fault basis for damage caused elsewhere in outer space.
(3) Liability shall extend to environmental

[165] Henry Hertzfeld and Frans von der Dunk, 'Bringing Space Law into the Commercial World: Liability for Satellite Communications' (1993) 20(1) J Space L 1.

damage whether or not direct harm to persons or property occurs.

Article 3:- Environmental Impact Assessment (EIA)

Prior to authorizing any space activity with potential transboundary or extraterrestrial environmental effects, States shall conduct an Environmental Impact Assessment consistent with guidelines adopted by the Space Environmental Protection Agency (SEPA) established under this Protocol.

Article 4: - Remediation and Compensation

(1) States found responsible for environmental damage shall restore the environment to baseline conditions where feasible.
(2) Where restoration is not possible, monetary compensation shall be paid into the International Compensation Fund.

2. Establishment of the International Space Regulatory Authority (ISRA) to oversee licensing, compliance monitoring, and registry functions for high-risk space activities.

Core Charter Elements:

Authority: Operates under the OST; empowered to set minimum licensing standards and safety protocols.

Membership: Open to all OST parties; decisions made by weighted majority voting to ensure equitable representation.

Powers: Maintain an international registry of space objects. Conduct compliance audits of national licensing regimes. Issue suspension orders for operators posing imminent risk. Require submission of EIAs for high-risk missions.

Transparency: All licensing and compliance reports to be made publicly available.

3. Creation of the Space Environmental Protection Agency (SEPA), functions would be to develop and enforce scientific standards for space environmental protection. Set quantitative limits on debris creation per mission, define "harmful contamination" for celestial bodies and Earth's environment. Maintain a scientific monitoring network for orbital debris and planetary contamination risks. Issue remediation orders to responsible states or operators.

4. Standing Space Dispute Tribunal to provide binding dispute resolution for space law conflicts.[166]

Jurisdiction: Disputes between states regarding Outer Space Treaty /Protocol obligations. Claims by private entities or individuals against states (with optional consent by the state). Appeals from ISRA or SEPA enforcement decisions.

Procedures: - Expedited hearings for urgent cases (e.g., imminent collision, environmental hazard). Hybrid bench of legal and technical experts. Decisions binding on parties and enforceable through treaty sanctions.

5. International Compensation & Insurance Mechanism to ensure prompt payment for damage without political delay.

Structure: - Mandatory insurance premiums from licensed operators, annual contributions from member states, and fines from enforcement actions. Managed by ISRA in cooperation with SEPA.

Claims Process: - Direct filing by affected individuals, corporations, or states. Independent claims panel decision within fixed deadlines. Appeals allowed to the Space Dispute Tribunal.

6. Enforcement and Sanctions: - Suspension or revocation of launch/operation licenses. Fines and mandatory contributions to remediation funds. Public censure, reporting to the UN Security Council for severe breaches. Denial of access to launch facilities or tracking networks for persistent violators.

7. Amendment and Review Clauses

Protocol to be reviewed every ten years with mandatory updates to technical standards. Amendments require two-thirds majority of parties present and voting. Urgent technical

[166] Frans von der Dunk and Fabio Tronchetti (eds), *Handbook of Space Law* (Edward Elgar 2015).

updates (e.g., debris thresholds) can be adopted by SEPA with supermajority board approval, pending ratification.

Impact of These Reforms

If implemented, these measures would:

i. Convert the Outer Space Treaty's aspirational norms into enforceable obligations.
ii. Create permanent institutions capable of adapting to new technology.
iii. Ensure environmental and individual rights protection alongside state interests.
iv. Provide rapid, depoliticized dispute resolution and compensation.

Conclusion: - From Principles to Governance

The Outer Space Treaty was a visionary achievement of its time, capturing the optimism and diplomatic pragmatism of an era when space was the exclusive playground of two superpowers and laid down the foundation and opening doors to States journey to Space. It established the foundational principles that have, for more than half a century, kept outer space free from national appropriation and weapons of mass destruction. For this reason, it is rightly called the "Constitution of Outer Space."

Yet a constitution that lacks institutions, enforcement mechanisms, and rights protections risks becoming a symbolic text rather than a living framework. The Outer Space Treaty's reliance on state goodwill, its absence of clear definitions, and its silence on environmental and individual rights leave it ill-equipped to address the realities of the 21st century: commercial mega-constellations[167], lunar mining ventures, reusable heavy-lift launchers, and the cumulative hazards of space debris.

The proposals in this paper clarifying liability, defining damage, establishing a Space Regulatory Authority, creating an environmental protection agency, forming a standing dispute tribunal, and ensuring direct compensation mechanisms would not replace the Outer Space Treaty. Instead, they would give life to its ideals. By pairing its principles with enforceable obligations, independent oversight, and meaningful rights for states, private actors, and individuals, the treaty could evolve from a static Cold War instrument into a modern governance architecture.

Outer space is no longer an empty frontier; it is a shared environment whose stewardship demands the same level of institutional maturity that we expect for the governance of our oceans,[168] our atmosphere[169], and our own national territories. If the Outer Space Treaty is truly to be the constitution of space, it must also be the constitution of a government one capable of protecting the common heritage of humankind while enabling peaceful, sustainable, and equitable use for generations to come.

[167] Moriba Jah and Darren McKnight, 'Sustainability of Large Satellite Constellations' (2020) 6 Nature Astronomy 420.

[168] David Freestone, *The 1982 Law of the Sea Convention at 30* (Martinus Nijhoff 2013).

[169] Edith Brown Weiss, *In Fairness to Future Generations: International Law, Common Patrimony, and Intergenerational Equity* (Dobbs Ferry: Transnational Publishers 1989).