

Revisiting the Moon Agreement

Analysing 45 Years of Policy and Legal Trends through the
Lens of NewSpace Commercialisation

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What Does UTAT Aerospace Policy Do?

The UTAT Aerospace Policy division strives to encourage the University of Toronto and international aerospace communities to adopt practices that foster long-term aerospace sustainability

Policy-Oriented Research

Science Communication and Outreach



What Does UTAT Aerospace Policy Do?



Mitigating Space Debris
through Risk Assessment
Frameworks

IAC 2021

UAS-Integrated Last
Mile Delivery
AIAA Aviation Forum and
Exposition 2024

Revisiting the Moon
Agreement
IAC 2023

— International Space Law and Why it Needs Updating —



Sources of International Law

Treaty: memorialization of agreements made between states

Customary Law

General Principles

Judicial Decisions



Source: UNOOSA

In 1959, the UN established the Committee on the Peaceful Uses of Outer Space (COPUOS) to “govern the exploration and use of outer space for the benefit of all humanity”. COPUOS and the United Nations Office for Outer Space Affairs (UNOOSA), its advisory secretariat body, introduced five space treaties

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*The Outer Space
Treaty
(1967)*

*The Rescue
Agreement
(1967)*

*The Liability
Convention
(1971)*

*The Registration
Convention
(1974)*



4 + 1 UN Space Treaties

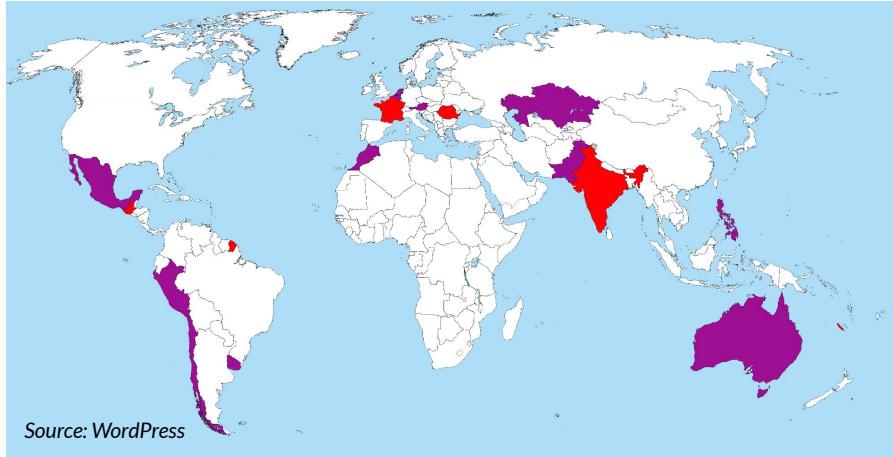


*The Moon Agreement
(1979)*



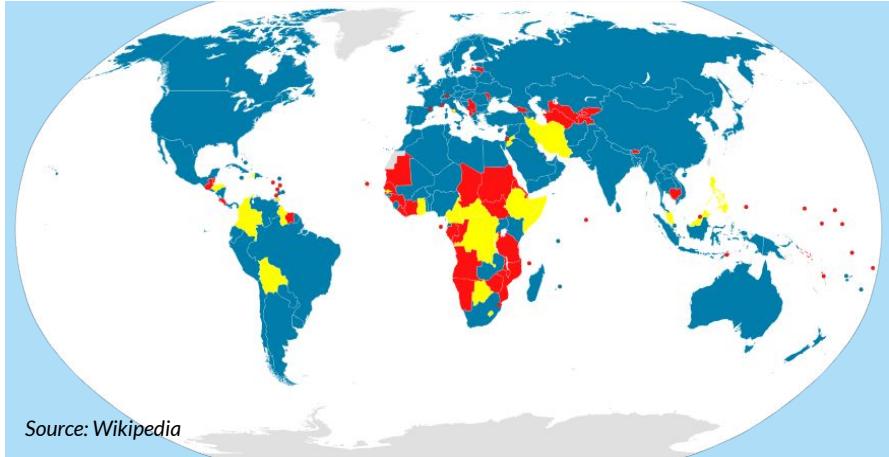
Source: UNOOSA

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█ = Parties (17)
█ = Signatories (11)

The Moon Agreement



█ = Parties (114)
█ = Signatories (89)
█ = Non-Parties

The Outer Space Treaty

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Past and Current Challenges in the Ratification of the Moon Agreement



The “Common Heritage of Mankind” Clause



Prohibition of Appropriation of Land and Ambiguity of Resource Ownership



The Establishment of a Governing International Regime



Non-consideration of Private Actors

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The “Common Heritage of Mankind” Clause

Article 11 Paragraph 1 (MA)

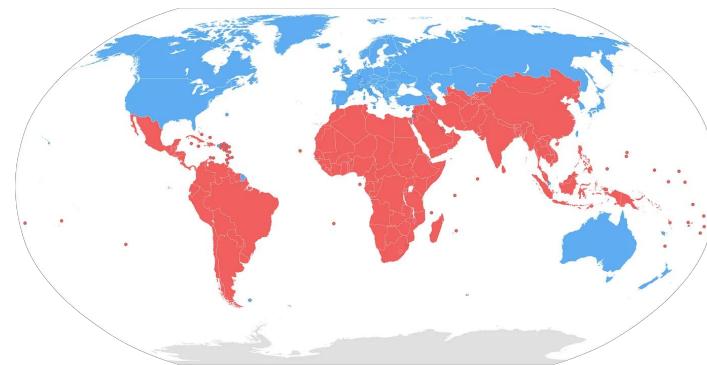
“The moon and its natural resources are the **common heritage of mankind** which finds its expression in the provisions of this Agreement”



No clear definition is given, causing a general split in interpretation between developing and developed countries

Article 1 (OST)

“The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and interests of all countries [...] and shall be the **province of all mankind**”



■ = Developed countries

■ = Developing countries

Source: Medium

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The “Common Heritage of Mankind” Clause

Developing Country Stance

Res Communis Theory of Property

Denies sovereign rights
to areas of pristine space

Management of property
by an international body

Sharing of benefits
between all parties

Avoids
marginalization
due to restricted
technological
capabilities and
redistributes
global wealth

Developed Country Stance

Freedom of the Seas Theory of Property

Denies sovereign rights
to areas of pristine space

Private ownership rights
to resources

Using resources
for national
industries while
respecting
others' rights
and activities

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Prohibition of Appropriation of Land and Ambiguity of Resource Ownership

Article 11 Paragraph 2 (MA)

"The moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means"



Article 11 Paragraph 3 (MA)

"Neither the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person. The placement of [objects] on the moon.... shall not create a right of ownership over the surface or the subsurface of the moon or any areas thereof"

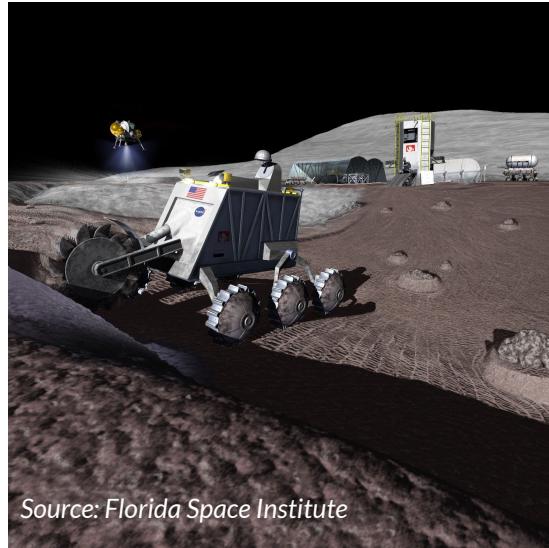


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Prohibition of Sovereignty and Appropriation

Does the Moon Agreement forbid the ownership and commercial exploitation of resources extracted from celestial bodies?

Is traditional Earth-like ownership of land and property a necessary requirement for sustainable, peaceful, and profitable operations on celestial bodies?



Source: Florida Space Institute

There is uncertainty about the extent of protection or enforcement for your space resource claim, or whether ownership is possible at all

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Establishing a Governing International Regime

Article 11 Paragraph 5 (MA)

“State Parties to this Agreement hereby undertake to establish an international regime, including appropriate procedures, to govern the exploitation of the natural resources of the moon as such exploitation is about to become feasible”



Article 11 Paragraph 7 (MA)

“The main purposes of the international regime to be established shall include: [...] (d) An equitable sharing by all state parties in the benefits derived from those resources, where the interests and needs of the developing countries, as well as the effort of those countries which have contributed either directly or indirectly to the exploration of the moon, shall be given special consideration”



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Establishing a Governing International Regime

Achieves overall fairness by...



**A System Governed by
International Theory of Equity**



**Remedying Social Injustices and
Economic Disparities**



Source: Science Business



Source: World Bank

Reaffirms belief that sharing of information, technology, space resources and profits between developed and developing countries is needed to promote equal opportunity in outer space. However, compulsory benefit sharing deters investment

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Challenges with Private Actors

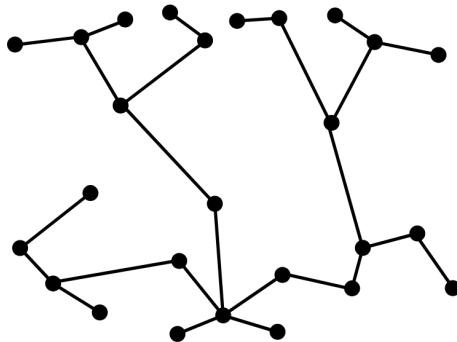
Article 14 Paragraph 1

"State Parties to this Agreement shall bear international responsibility for national activities on the moon, 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 this Agreement"



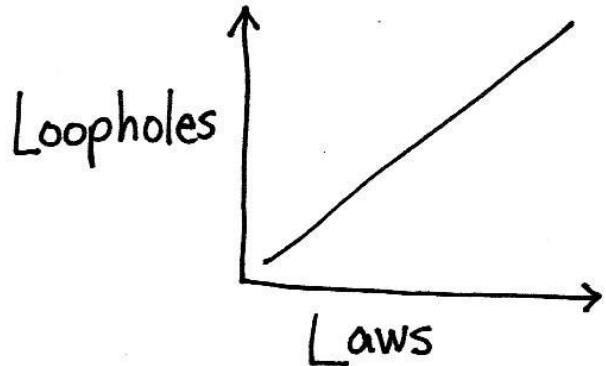
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Challenges with Private Actors



**Fragmentation of Law:
Contradictions, Loopholes, and
A Deterrent to Good-Faith
Investment in Space**

- Luxembourg Space Law of 2017
- US Commercial Space Competitiveness Act of 2015
- Japan 2021 Act on Promotion of Business Activities Related to the Exploration and Development of Space Resources (No. 83)
- Artemis Accords



Source: Forbes

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Why Do We Need a Moon Agreement for the 21st Century Anyways?

Conflicting and ambiguous regulations on space resource exploitation within the global space community serve as obstacles to investments

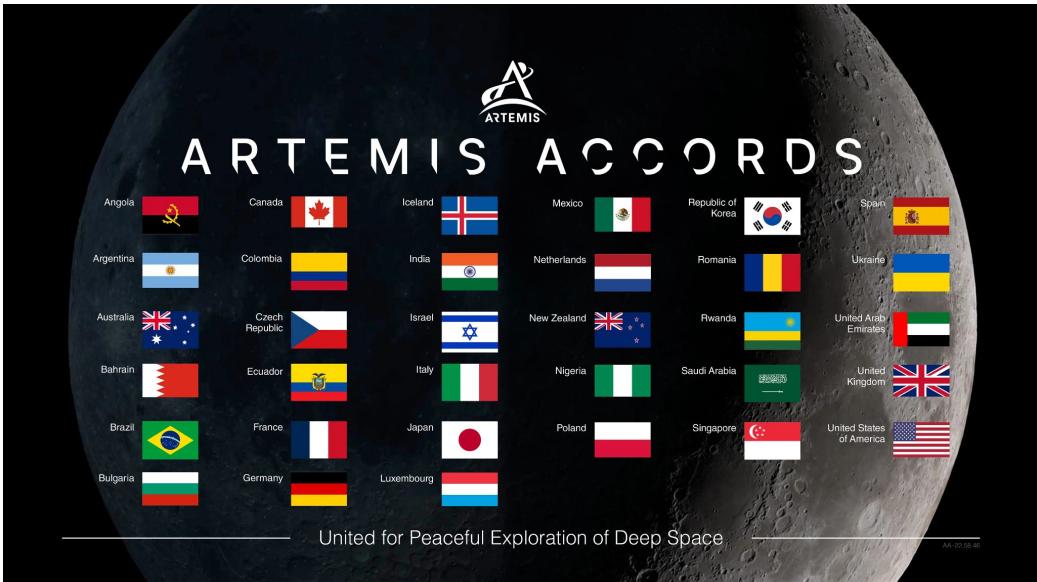
Consequences

Limited investment or a lack of increased funding results in minimal technological innovation and socio-economic benefits

Spacefaring nations will not cease activity pending regulation. Some will resort to exploiting the lack of a system, while others may independently craft policies to favor their interests in the vacuum of wider regulation. The time to act is now to ensure the original ideals of international space law are preserved

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The Artemis Accords: A Recent Effort to Address Moon Agreement Gaps



34 signatories (e.g., Australia, Canada, Italy, Japan, Luxembourg, the United Arab Emirates, the United Kingdom and the United States)

Criticized for being U.S. centric

Circumvent international law, devaluing the UN's established and collaborative process of creating space regulations

Our Research Methodology

Examples of Intersectional Research Questions that Guided Our Line of Thinking

Q1

What makes a successful international regulatory framework (i.e., necessary components) for space exploration and exploitation in the 21st century?

Q2

What form will this international regulatory framework take?

Q3

How will this international regulatory framework operate in conjunction with existing and emerging international and national space law?

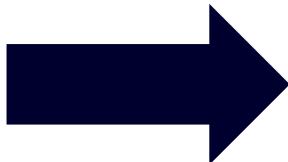
Our Research Methodology

Grounded Theory Style of Qualitative Meta-Analysis

Developed eligibility criteria for selection of sources to analyse

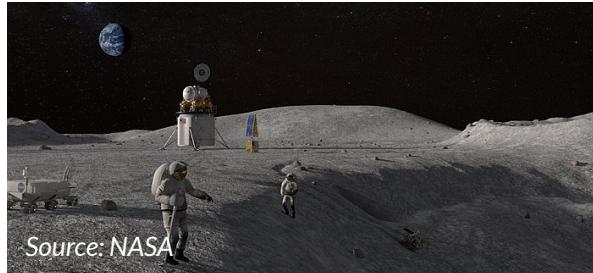
Assess selected sources for their credibility and reliability

Iteratively collect and analyse data according to Anselm L. Strauss' coding principles (i.e., open coding, axial coding, selective coding)



Answer Research Questions

Empower the Creation of a Clear Regulatory Framework



Our Research Methodology

Time Period	Key Events	Number of Sources Analysed in QMA
1960 to 2000	Space Race; Creation of Moon Agreement, UNOOSA, and COPUOS	13
2001 to 2015	Pre-NewSpace Era; Creation of the U.S. Commercial Space Launch Competitiveness Act	10
2016 to 2020	Beginning of NewSpace Era; Creation of Artemis Accords	14
2020 to Present	NewSpace Era; Post-Artemis Accords	10



Analogous International Law



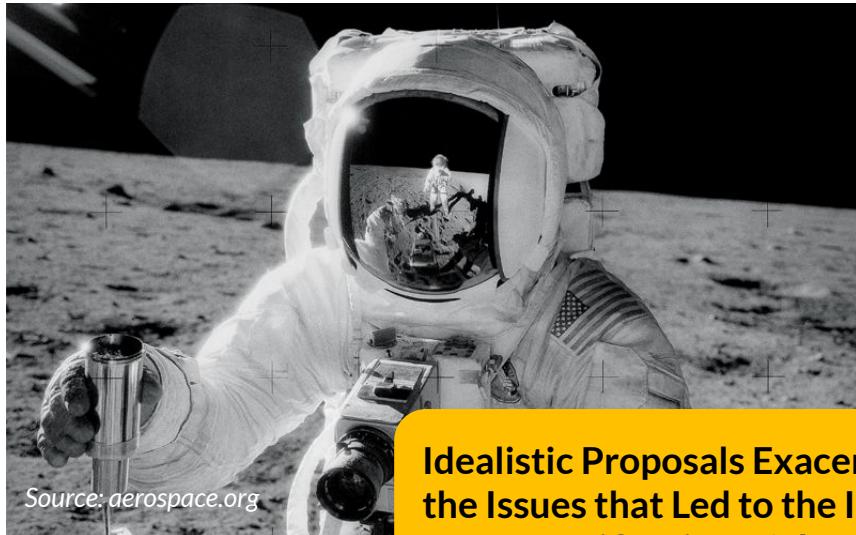
Emerging Competing Multilateral and Domestic Space Legislations



Academic and Industry Proposals

Analysis of Proposed Solutions

Academic and Industry Proposals on the Resolution of the MA Issues



Source: aerospace.org

Idealistic Proposals Exacerbate
the Issues that Led to the Initial
Non-Ratification of the MA

Opening Pandora's Box of Space Law

Proposed international regime;
retains ownership of celestial
bodies

Leasing land through permits and
implementing fines; direct
enforcement

Analysis of Proposed Solutions

Academic and Industry Proposals on the Resolution of the MA Issues

The Space Settlement Prize Act

First-come, first-serve land allocation recognized by government

Ability of owner to sell and hold the land



Radical Reaction to Protect Free Market Principles Contravene with Existing International Law

Analysis of Proposed Solutions

Analogues

Mechanisms presented in academic and industry proposals were extracted from analogues

Analogue: international legislation, similar to the Moon Agreement in nature, regulating activities that occur on Earth's land, sea, atmosphere, and orbital environment

Antarctica Treaty

Montreal Protocol on CFCs

Principles on Remote Sensing

Law of the Sea

International Communications Union

Open Skies Treaty

International Space Station (IGAs and MOUs)

Analysis of Proposed Solutions

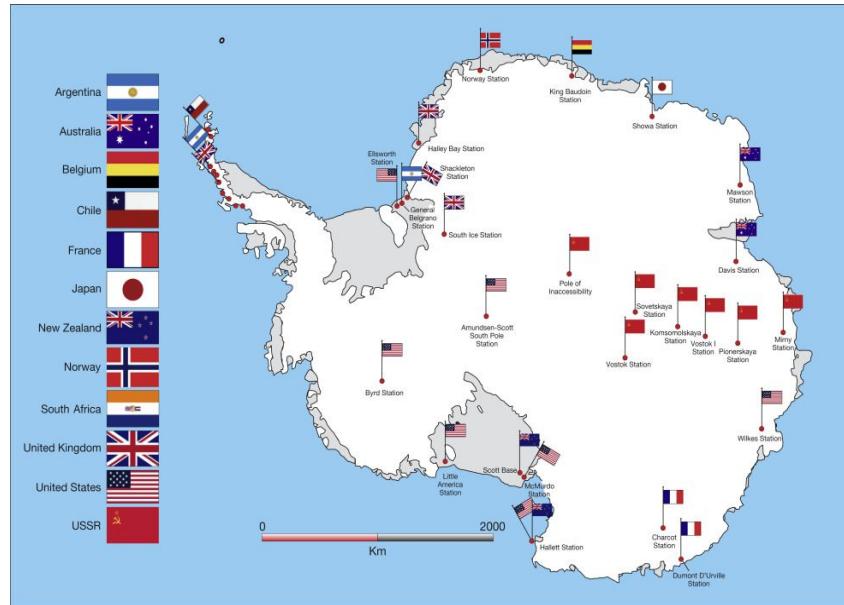
Analogues: The Antarctica Treaty and Licensing

Antarctica Treaty of 1961

Wellington Convention: Licensed-based approach to resource extraction. Failed to implement its protocols.

Succeeded by Madrid Protocol which states that “any activity relating to mineral resources, other than scientific research, shall be prohibited”

A Unified Domestic Licensing System is Favourable



Analysis of Proposed Solutions

Analogues: The Law of the Sea and International Body/Regime

Relevant Bodies: International Seabed Authority and The “Enterprise”



1994 Amendment removed mandatory technology transfer and financing of Enterprise operations

USA is not a member of UNCLOS, thus they are unable to access deep-mining contracts or claim any other state is violating the convention

Establishment of Restrictive International Regimes are Rejected by Stakeholders w/ Enforcement Ability

Analysis of Proposed Solutions

Analogues: The International Space Station and IGAs and MOUs

Intergovernmental Agreements

General Principles and conduct for outer space derived from bilateral and multilateral agreements



Memorandum of Understanding

Bilateral understanding that outlined the design, development, and operation of an ISS component

Modular Approach of These IGAs and MOUs Show Feasibility in Combining Differing Types of Legislation

Analysis of Proposed Solutions

Emerging Legislations: (So Far) the Only Domestic Space Resource Laws

Rank	Country	Legislation Details
1	United States	2015 US Commercial Space Competitiveness Act; Artemis Accords
2	United Arab Emirates	Federal Law No. (12) of 2019 on the Regulation of the Space Sector
3	Japan	2021 Act on Promotion of Business Activities Related to the Exploration and Development of Space Resources (No. 83 of 2021)
4	Luxembourg	Law of July 20th 2017 on the Exploration and Use of Space Resource

Resource Appropriation	Licensing	International Obligations	Applicability
Yes (Explicit interpretation of int'l space law)	Required (through other laws)	OST	Citizen, national, organised in country
Yes (Implicit interpretation of int'l space law)	Required, transferable with consent	OST	Citizen, national, organised in country
Yes (Implicit interpretation of int'l space law)	Required, transferable with consent	OST	Launch and control must be within Japan
Yes (Explicit interpretation of int'l space law)	Required, non-transferable	OST	Citizen, national, organised in country

Analysis of Proposed Solutions

Emerging Legislations: Artemis Accords

Artemis Accords: A Controversial Solution to the Challenges of the MA

Affirming obligations of state parties with respect to private actors under OST 11 and MA 14.1

Definition of term “harmful interference” in OST 9 through the creation of “safety zones”

Recognition that extraction of space resources does not constitute national appropriation under OST 2

Bilateral nature (use of political commitments between the US and other states) instead of UN treaty process

Continue to uphold OST as the international space law standard, ignore MA due it is de facto and de jure unenforceability

Controversial:
US-led (geopolitics), circumvents treaty process, harmful commercialisation

Sidestepping Moon Agreement contentious issue (ownership of extracted resources) by resolution through “targeted” interpretation of OST Article 2

Create concept of safety zones to sidestep issue of land ownership as prerequisite to investment/security guarantee and its implications in the OST and MA

The Way Forward

Summary of Trends

Specific Moon Agreement Idealism Causes Fundamental Non-Compliance, but Everyone Still Follows OST

Emerging Domestic Legislation Trends Indicate Reality of Resource Extraction Future and Potential for Fragmentation

International Space Law is Unlikely to be Amended, but Flexibility Has Increased Since 1970s



Artemis Accords Highlight These Issues and Have Initial Success, But Are Not Perfect



The Way Forward

1. Presently Accepted International Space Law

Present-day Widely Accepted International Space Law

Outer Space Treaty, Registration Convention, Liability Convention and Rescue Agreement

Broad, universally acceptable rules codified into international law

Sufficient flexibility to allow for interpretation of articles without having to introduce new instruments of international law

The Way Forward

2. Presently Accepted International Space Law

New Multilateral Agreement Based on the Artemis Accords

Bridge between universally accepted international law and varying domestic legislations. Consists of minimal provisions that ensure consistency of domestic laws while being acceptable for stakeholders to adopt

Recognition of extracted space resource ownership under OST Article II and defined safety zones as an instrument of non-interference per OST Article IX

Introduction through a non-US bilateral forum such as a multilateral agreement, potential be eventually incorporated into int'l law with customary practice

Delegation of safety zone registry maintenance to an external body such as the United Nations

The Way Forward

3. Emerging Domestic Legislations

Emerging Domestic Legislations

US, Luxembourg, UAE, Japan and other emerging domestic space resource laws

Mission or activity authorisation, licensing requirements, taxation or profit sharing regulations

Enforcement of provisions set out in first two tiers for non-state entities

Level at which bilateral agreements and MOUs are entered with other states for more detailed agreements



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Thank you

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