

INTERNATIONAL JOURNAL FOR LEGAL RESEARCH AND ANALYSIS



Open Access, Refereed Journal Multi Disciplinary
Peer Reviewed

www.ijlra.com

DISCLAIMER

No part of this publication may be reproduced, stored, transmitted, or distributed in any form or by any means, whether electronic, mechanical, photocopying, recording, or otherwise, without prior written permission of the Managing Editor of the *International Journal for Legal Research & Analysis (IJLRA)*.

The views, opinions, interpretations, and conclusions expressed in the articles published in this journal are solely those of the respective authors. They do not necessarily reflect the views of the Editorial Board, Editors, Reviewers, Advisors, or the Publisher of IJLRA.

Although every reasonable effort has been made to ensure the accuracy, authenticity, and proper citation of the content published in this journal, neither the Editorial Board nor IJLRA shall be held liable or responsible, in any manner whatsoever, for any loss, damage, or consequence arising from the use, reliance upon, or interpretation of the information contained in this publication.

The content published herein is intended solely for academic and informational purposes and shall not be construed as legal advice or professional opinion.

**Copyright © International Journal for Legal Research & Analysis.
All rights reserved.**

ABOUT US

The *International Journal for Legal Research & Analysis (IJLRA)* (ISSN: 2582-6433) is a peer-reviewed, academic, online journal published on a monthly basis. The journal aims to provide a comprehensive and interactive platform for the publication of original and high-quality legal research.

IJLRA publishes Short Articles, Long Articles, Research Papers, Case Comments, Book Reviews, Essays, and interdisciplinary studies in the field of law and allied disciplines. The journal seeks to promote critical analysis and informed discourse on contemporary legal, social, and policy issues.

The primary objective of IJLRA is to enhance academic engagement and scholarly dialogue among law students, researchers, academicians, legal professionals, and members of the Bar and Bench. The journal endeavours to establish itself as a credible and widely cited academic publication through the publication of original, well-researched, and analytically sound contributions.

IJLRA welcomes submissions from all branches of law, provided the work is original, unpublished, and submitted in accordance with the prescribed submission guidelines. All manuscripts are subject to a rigorous peer-review process to ensure academic quality, originality, and relevance.

Through its publications, the *International Journal for Legal Research & Analysis* aspires to contribute meaningfully to legal scholarship and the development of law as an instrument of justice and social progress.

PUBLICATION ETHICS, COPYRIGHT & AUTHOR RESPONSIBILITY STATEMENT

The *International Journal for Legal Research and Analysis (IJLRA)* is committed to upholding the highest standards of publication ethics and academic integrity. All manuscripts submitted to the journal must be original, unpublished, and free from plagiarism, data fabrication, falsification, or any form of unethical research or publication practice. Authors are solely responsible for the accuracy, originality, legality, and ethical compliance of their work and must ensure that all sources are properly cited and that necessary permissions for any third-party copyrighted material have been duly obtained prior to submission. Copyright in all published articles vests with IJLRA, unless otherwise expressly stated, and authors grant the journal the irrevocable right to publish, reproduce, distribute, and archive their work in print and electronic formats. The views and opinions expressed in the articles are those of the authors alone and do not reflect the views of the Editors, Editorial Board, Reviewers, or Publisher. IJLRA shall not be liable for any loss, damage, claim, or legal consequence arising from the use, reliance upon, or interpretation of the content published. By submitting a manuscript, the author(s) agree to fully indemnify and hold harmless the journal, its Editor-in-Chief, Editors, Editorial Board, Reviewers, Advisors, Publisher, and Management against any claims, liabilities, or legal proceedings arising out of plagiarism, copyright infringement, defamation, breach of confidentiality, or violation of third-party rights. The journal reserves the absolute right to reject, withdraw, retract, or remove any manuscript or published article in case of ethical or legal violations, without incurring any liability.

WHO OWNS A RESOURCE EXTRACTED FROM AN ASTEROID? RECONCILING THE OUTER SPACE TREATY WITH COMMERCIAL SPACE MINING

AUTHORED BY - AVIK SAPAL

B.A. LL.B., The National Law Institute University, Bhopal

CO-AUTHOR - RUDRAKSH THOURWAL

B.A. LL.B., The National Law Institute University, Bhopal

Abstract

Commercial space mining exposes a distinction that international space law has never fully resolved: a prohibition on appropriating celestial bodies does not necessarily determine the ownership of material removed from them. This article examines whether, and on what conditions, ownership of extracted asteroid resources can coexist with the Outer Space Treaty. Through doctrinal and comparative analysis, it evaluates the Treaty's provisions on use, non-appropriation, supervision and due regard, the different obligations arising under the Moon Agreement, and resource legislation in the United States, Luxembourg and Japan. It then considers India's Space Policy 2023 and the contribution of the Artemis Accords and multilateral initiatives. The article argues that neither an unrestricted rule of first possession nor a categorical prohibition on extraction adequately reconciles the applicable principles. Instead, recognition should attach to identifiable resources obtained through a lawful, supervised operation, without conferring territorial control or exclusive rights over unextracted deposits. A proposed framework separates operational permission, acquisition of title and international recognition, while preserving environmental safeguards, meaningful access and opportunities for participation by developing states. Domestic property certainty is therefore defensible only when accompanied by internationally accountable resource governance.

Keywords: Asteroid mining; Outer Space Treaty; non-appropriation; space resources; property rights; international recognition.

I. Introduction

A company that recovers water from an asteroid may expect to sell it, consume it as fuel or pledge the resulting inventory to a lender. Each transaction presupposes an answer to a question that engineering success cannot resolve: what legally entitles the company to the material? Article I of the Outer Space Treaty permits exploration and use, while Article II prohibits national appropriation of outer space, including celestial bodies.¹ Neither provision supplies a complete property system for extracted resources. The difficulty concerns the relationship between these provisions, rather than the absence of applicable law.

Physical recovery is already demonstrated on a scientific scale. NASA's OSIRIS-REx mission delivered 121.6 grams of material from Bennu to Earth in September 2023.² Yet scientific sample return does not, by itself, establish an unrestricted entitlement to industrial extraction. Commercial operations raise additional questions about depletion, exclusion, contractual title and the distribution of benefits. A small sample, a tank of processed water and the capture of an entire asteroid cannot be assumed to have identical legal consequences merely because all involve possession.

National lawmakers have nevertheless moved ahead. United States legislation recognises rights in resources obtained through commercial recovery.³ Japan connects acquisition of ownership to an authorised business plan and possession with an intention to own.⁴ These measures offer domestic certainty, but a municipal entitlement and a right enforceable against the international community remain different propositions. A state cannot resolve that difference simply by declaring its preferred interpretation compatible with its treaty obligations.⁵

This article argues that ownership of extracted resources is defensible under the Outer Space Treaty when the resource is identifiable, the operation complies with the Treaty and the entitlement does not function as a claim to the celestial body. This is an interpretive position, not a claim that universal recognition has been settled. The analysis separates three questions: permission to operate, acquisition of property and recognition beyond the authorising

¹ 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 arts I–II.

² NASA, 'NASA Announces OSIRIS-REx Bulk Sample Mass' (15 February 2024) <<https://science.nasa.gov/blogs/osiris-rex/2024/02/15/nasa-announces-osiris-rex-bulk-sample-mass/>> accessed 30 September 2026.

³ 51 USC § 51303.

⁴ Act on the Promotion of Business Activities for the Exploration and Development of Space Resources, Act No 83 of 2021 (Japan), art 5.

⁵ Vienna Convention on the Law of Treaties (opened for signature 23 May 1969, entered into force 27 January 1980) 1155 UNTS 331 art 27.

jurisdiction. It uses treaty interpretation and comparative legislation, rather than predictions about mineral prices or mission profitability, to develop a framework for reconciling commercial security with shared access.

II. Use Without National Appropriation

Reading Articles I and II together

Interpretation begins with the ordinary meaning of treaty language in its context and in light of the instrument's object and purpose, following the approach reflected in Article 31 of the Vienna Convention on the Law of Treaties.⁶ Selecting either freedom of use or non-appropriation as an overriding principle would distort that exercise. The relevant provisions form a common arrangement: access and use are protected because outer space cannot be converted into national territory.⁷

Article I contains more than permission to enter space. Exploration and use must benefit and serve the interests of all countries, irrespective of economic or scientific development; access is to be available without discrimination and on a basis of equality.⁸ Commercial activity is not expressly excluded from use. Equally, a commercial purpose cannot exempt an activity from these conditions. The better reading permits economically useful activity while requiring its organisation to preserve the interests that make freedom of use meaningful for others.

Article II prohibits appropriation through sovereignty, use, occupation or other means.⁹ Accordingly, a disclaimer of sovereignty cannot be conclusive. An operator might avoid territorial vocabulary while obtaining indefinite, state-backed control over a deposit and excluding all competitors. Where practical effects resemble the control that Article II forbids, the legal assessment must examine those effects. Otherwise, a drafting choice would permit the very appropriation that the provision prevents.

The strongest argument for resource ownership distinguishes the celestial body from material separated from it. A quantity of water in a storage vessel can be owned without a claim to the asteroid from which it came. The Artemis Accords adopt a compatible, qualified position by stating that resource extraction does not inherently constitute national appropriation.¹⁰ The

⁶ Vienna Convention (n 5) art 31(1).

⁷ Vienna Convention (n 5) art 31(2).

⁸ Outer Space Treaty (n 1) art I.

⁹ Outer Space Treaty (n 1) art II.

¹⁰ The Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes (13 October 2020) s 10(2) <<https://www.nasa.gov/wp-content/uploads/2022/11/Artemis-Accords-signed-13Oct2020.pdf>> accessed 30 September 2026.

qualification matters. It allows examination of the particular operation and does not declare every extraction lawful.

That distinction is persuasive but incomplete. Physical severance explains what the property claim concerns; it does not establish that the preceding activity was permissible. Extraction could obstruct another mission, contaminate a scientifically valuable site or exhaust the only practically accessible deposit. Such conduct requires examination under Article IX, even if the resulting material can be described separately from its source.¹¹ Ownership should therefore be analysed alongside the manner of acquisition, rather than treated as a consequence that retrospectively validates it.

Private actors and state responsibility

The argument that Article II restrains states while leaving private appropriation unrestricted fails to account for Article VI. States bear international responsibility for national activities, including those conducted by non-governmental entities, whose activities require authorisation and continuing supervision.¹² A private company cannot use its corporate status to remove a national operation from the treaty framework. Nor can a state recognise a private territorial entitlement that it would be forbidden to assert directly.¹³

This does not mean that Article VI automatically attributes every corporate act to the state under the ordinary rules of state responsibility. It establishes a specific treaty obligation concerning national activities and their conformity with the Treaty. The International Law Commission's Articles on State Responsibility separately address attribution and preserve special rules governing responsibility.¹⁴ Keeping these concepts distinct prevents both overstatement of state liability and understatement of the supervisory duty.

Article VIII supplies another necessary distinction. It preserves jurisdiction and control over registered space objects and provides that ownership of launched objects is not affected by their presence in space.¹⁵ A mining spacecraft may therefore remain privately owned on an asteroid. However, jurisdiction over the spacecraft does not itself confer sovereignty over the surrounding site or ownership of every substance encountered. Equipment ownership is a stable legal starting point, not an automatic bridge to mineral title.

¹¹ Outer Space Treaty (n 1) art IX.

¹² Outer Space Treaty (n 1) art VI.

¹³ Outer Space Treaty (n 1) arts II and VI.

¹⁴ International Law Commission, 'Articles on Responsibility of States for Internationally Wrongful Acts' (2001) UN Doc A/56/10, ch IV.E.1 arts 4, 8 and 55.

¹⁵ Outer Space Treaty (n 1) art VIII.

III. The Moon Agreement and The Limits of Analogy

The Moon Agreement is relevant to asteroid mining despite its name. Article 1 extends its provisions concerning the Moon to other celestial bodies within the solar system, apart from Earth, unless specific legal norms concerning a particular body enter into force.¹⁶ Its resource provisions therefore cannot be dismissed as exclusively lunar. They must instead be assessed by reference to the states bound by the Agreement and the obligations those states accepted.

Article 11 characterises the Moon and its natural resources as the common heritage of mankind. It excludes ownership of the surface, subsurface and resources in place, including ownership by private entities.¹⁷ Its language expressly reaches beyond sovereign territorial claims. Yet the phrase concerning resources in place also prevents the careless assertion that the Agreement expressly prohibits every form of possession after extraction.

The Agreement contemplates an international regime when exploitation is about to become feasible. The regime's purposes include orderly development, rational management, expanded opportunities and equitable sharing of benefits, with special consideration for developing countries and the contributions of states involved in exploration.¹⁸ This is a more specific institutional and distributive commitment than the Outer Space Treaty's general benefit principle. Collapsing the two instruments would erase the legal significance of their different formulations.

Article 6 allows collection and removal of samples for scientific investigation and permits appropriate quantities of lunar substances to support missions.¹⁹ Read together with Article 11, it supports neither a simple prohibition on all resource use nor an unqualified commercial entitlement. Whether particular exploitation before an international regime exists complies with the Agreement remains an interpretive question. Article 11(8) requires resource activities to remain compatible with the purposes identified in paragraph 7 and with Article 6(2).²⁰ The important point is that a party cannot disregard Article 11's regime-building and benefit-sharing commitments by relying exclusively on freedom of use.

Participation also matters. The United Nations depositary records India's signature on 18 January 1982 without ratification; it does not list the United States, Luxembourg or Japan as

¹⁶ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (adopted 5 December 1979, entered into force 11 July 1984) 1363 UNTS 3 art 1(1).

¹⁷ Moon Agreement (n 16) art 11(1)–(3).

¹⁸ Moon Agreement (n 16) art 11(5) and (7).

¹⁹ Moon Agreement (n 16) art 6(2).

²⁰ Moon Agreement (n 16) art 11(8).

parties.²¹ The Moon Agreement cannot simply impose its treaty obligations on non-parties, consistently with the rule reflected in Article 34 of the Vienna Convention.²² Conversely, limited participation does not make the Agreement legally irrelevant to its parties or erase its contribution to competing governance proposals.

Analogies to terrestrial commons must be similarly disciplined. Shared access does not necessarily require that every recovered object remain collectively owned; equally, freedom to use a common domain does not necessarily create an unlimited right of capture. The Hague Working Group's Building Blocks distinguish resource rights from priority rights and propose international recognition of both within a future framework.²³ Their separate treatment shows why debates about who owns extracted material cannot resolve access to the deposit itself.

IV. What Domestic Recognition Actually Provides

The United States and Luxembourg

The United States Commercial Space Launch Competitiveness Act 2015 introduced the resource provisions now found in Title 51 of the United States Code. Section 51303 recognises a qualifying citizen's entitlement to resources obtained, including possession, ownership, transport, use and sale, subject to applicable law and international obligations.²⁴ The relevant object is the recovered resource. Section 403 of the 2015 Act separately disclaims sovereignty, exclusive rights or ownership over a celestial body.²⁵ These provisions establish a deliberate distinction, although a disclaimer cannot settle the legality of every operation undertaken under it.

The legislation defines a space resource as an abiotic resource in situ, including water and minerals, while an asteroid resource is a space resource found on or within a single asteroid.²⁶ The distinction between the definition and the ownership provision is significant: defining the material before extraction does not itself vest title to an unworked deposit. Nor does Section 51303 grant a general international priority right to the first operator that announces an

²¹ United Nations Treaty Collection, 'Agreement Governing the Activities of States on the Moon and Other Celestial Bodies' (status table, ch XXIV.2) <https://treaties.un.org/pages/ShowMTDSGDetails.aspx?chapter=24&lang=en&mtdsg_no=XXIV-2&src=UNTSOnline&tabid=2> accessed 30 September 2026.

²² Vienna Convention (n 5) art 34.

²³ Luxembourg and the Netherlands, 'Building Blocks for the Development of an International Framework on Space Resource Activities' (3 February 2020) UN Doc A/AC.105/C.2/L.315 blocks 7–8.

²⁴ 51 USC § 51303.

²⁵ US Commercial Space Launch Competitiveness Act 2015, Pub L No 114-90, 129 Stat 704, s 403.

²⁶ 51 USC § 51301(1)–(2).

intention to mine.

Section 51302 links commercial recovery to authorisation and continuing federal supervision.²⁷ Resource ownership legislation therefore should not be read as dispensing with operational regulation. The commercial benefit of statutory recognition is substantial but specific: it reduces domestic uncertainty about whether the extracted commodity can be property. It does not substitute for compliance with other applicable regulatory requirements or guarantee recognition by foreign courts.

Luxembourg's 2017 law states that space resources are capable of being owned, while requiring written mission authorisation and compliance with the state's international obligations.²⁸ Its framework also addresses the operator's organisational arrangements, mission risks, financial resources and continuing supervision.²⁹ Ownership is thus situated within a regulatory relationship. That relationship is more useful to international legitimacy than a bare legislative declaration that resources are available for appropriation.

Neither model can unilaterally bind third states to recognise every resulting title. The relevant distinction resembles the separation between the domestic legality of a state act and its international character: the latter is not determined by municipal law.³⁰ A national licence may be valid internally even where another state disputes the operation's treaty compatibility. Recognition arrangements must confront that disagreement rather than assume that legislative confidence has removed it.

Japan and the significance of lawful possession

Japan's Act No 83 of 2021 makes the sequence more explicit. Article 3 requires a business activity plan identifying the purpose, period, location, methods and content of resource activities; Article 5 connects ownership to resources mined in accordance with that plan and possessed with an intention to own.³¹ This makes authorisation and the circumstances of acquisition relevant to the title itself. Mere technological capacity to seize material is insufficient under the statutory formulation.

Public notice of the licence and specified plan information is required, subject to a limited exception protecting interests that disclosure would unjustly harm.³² Transparency reduces the

²⁷ 51 USC § 51302(a)(3).

²⁸ Law of 20 July 2017 on the Exploration and Use of Space Resources (Luxembourg), arts 1–2.

²⁹ Space Resources Law 2017 (Luxembourg), arts 7, 10 and 15.

³⁰ Articles on State Responsibility (n 14) art 3.

³¹ Space Resources Act 2021 (Japan), arts 3(1) and 5.

³² Space Resources Act 2021 (Japan), art 4.

risk that overlapping operations develop without either actor knowing the other's plans. It also makes a claim of compliance more susceptible to scrutiny. However, notice is not consent: publication alone cannot authorise exclusion of competitors from a celestial body.³³

Articles 6 and 7 protect the implementation of international agreements, recognise other states' interests and support international coordination.³⁴ Taken together, the three jurisdictions demonstrate how national law can secure commercial expectations while preserving qualifications derived from international law. Their shared direction is relevant evidence of legal development, but the existence of several similar statutes does not establish a universally binding rule of resource ownership.

India and the distance between policy and property law

Paragraph 4(13) of India's Space Policy 2023 encourages non-governmental entities to undertake commercial recovery and recognises entitlement to possess, own, transport, use and sell resources obtained in accordance with applicable law, including India's international obligations.³⁵ The policy supplies a clear governmental position in favour of commercial resource activity. It should not, however, be described as a parliamentary enactment containing a comprehensive code for acquisition, transfer and competing claims.

IN-SPACe is assigned authorisation functions, and the policy envisages conditions for reviewing, revoking or modifying authorisations.³⁶ These provide an institutional starting point. For mining transactions, further precision is needed about when title arises, how a quantity is identified, which entity acquires it, and what follows if extraction exceeds permission. The recommendation is for dedicated statutory treatment of these questions, rather than an assumption that the policy has already resolved them.

India's unratified signature of the Moon Agreement adds a separate issue. Signature is different from consent to be bound by the entire treaty, but it raises the obligation not to defeat the treaty's object and purpose, reflected in Article 18 of the Vienna Convention.³⁷ Since India is not a party to the Vienna Convention, the relevant inquiry also concerns the customary rule,

³³ Outer Space Treaty (n 1) art I.

³⁴ Space Resources Act 2021 (Japan), arts 6–7.

³⁵ Department of Space, *Indian Space Policy 2023* para 4(13) <https://www.isro.gov.in/media_isro/pdf/IndianSpacePolicy2023.pdf> accessed 30 September 2026.

³⁶ Indian Space Policy 2023 (n 35) paras 5(1) and 5(22).

³⁷ Vienna Convention (n 5) art 18(a).

rather than direct application of that Convention as treaty law.³⁸ India should expressly assess this issue when designing resource legislation; declaring all commercial extraction prohibited, or treating its signature as meaningless, would each bypass the necessary analysis.

V. International Coordination Without Automatic Title

The Artemis Accords and subsequent practice

The Artemis Accords describe themselves as a political commitment, and their scope encompasses activities on asteroids as well as the Moon and Mars.³⁹ Their significance lies partly in translating general principles into operational expectations. Deplano identifies their movement towards adaptive governance: rules are developed incrementally as activities and experience expand.⁴⁰ That approach can accommodate technological uncertainty, although learning through practice requires safeguards against early operations deciding the terms of access for everyone else.

The Accords' resource provision must be read with their provisions on notification, coordination and due regard. Section 11 envisages safety zones based on the risks generated by operations, with boundaries adjusted when activities change and zones ending when operations cease.⁴¹ A safety zone is therefore defensible as a mechanism for preventing harmful interference. Treating it as a permanent concession over valuable terrain would detach it from that function.

Even temporary restrictions require scrutiny. An operator could announce successive activities that keep the same area inaccessible for decades. A formally renewable arrangement may thus achieve practical exclusion. Section 11 also commits signatories to respect free access and due regard.⁴² An assessment should examine the cumulative duration and actual extent of restriction, including whether workable alternatives would permit other missions to proceed safely.

The Accords do not amend the Outer Space Treaty. Article 31(3)(b) of the Vienna Convention requires subsequent practice establishing the parties' agreement on interpretation, not merely

³⁸ United Nations Treaty Collection, 'Vienna Convention on the Law of Treaties' (status table, ch XXIII.1) <https://treaties.un.org/Pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XXIII-1&chapter=23&Temp=mtdsg3&clang=_en> accessed 30 September 2026.

³⁹ Artemis Accords (n 10) s 1.

⁴⁰ Rossana Deplano, 'The Artemis Accords: Evolution or Revolution in International Space Law?' (2021) 70 ICLQ 799, 814–19.

⁴¹ Artemis Accords (n 10) s 11(7).

⁴² Artemis Accords (n 10) s 11(10).

repeated conduct by a subset.⁴³ The International Law Commission likewise distinguishes such agreement from other subsequent practice and cautions that silence counts as acceptance only where circumstances call for a reaction.⁴⁴ Neither technological leadership nor growing participation automatically converts a preferred interpretation into universally accepted treaty meaning.

Multilateral initiatives and their remaining gaps

The Hague Building Blocks offer proposals for a future framework, including recognition of resource rights, limited priority rights, safeguards and benefit-sharing. Their circulation as a working paper submitted by Luxembourg and the Netherlands did not transform them into binding United Nations rules.⁴⁵ Their value is architectural: they identify legal questions that a national ownership provision leaves unanswered. Their proposed priority regime, in particular, requires a distinct justification under non-appropriation.

The continuing COPUOS process confirms that a complete settlement remains under negotiation. In September 2026, Ünüvar's analysis of the Working Group's consolidated draft described proposed non-binding principles covering legality, sustainability, information and coordination, without resolving title or international recognition.⁴⁶ The draft's prospective character must be preserved in legal analysis. A negotiating text can reveal the direction of discussion, but cannot supply an operative property right or displace an existing treaty obligation.

NASA's 2020 selection of companies to collect small quantities of lunar material and transfer ownership to the agency illustrates a narrower development. The planned transaction concerned identified material collected by contractors, rather than a transfer of lunar territory.⁴⁷ It demonstrates how contractual arrangements can test domestic understandings of resource title. It does not establish that all treaty parties accept commercial ownership, and the existence of a procurement announcement should not be confused with proof that every contemplated collection occurred.

⁴³ Vienna Convention (n 5) art 31(3)(b).

⁴⁴ International Law Commission, 'Draft Conclusions on Subsequent Agreements and Subsequent Practice in Relation to the Interpretation of Treaties' (2018) UN Doc A/73/10, ch IV.E.1 conclusions 4(3) and 10(2).

⁴⁵ Hague Building Blocks (n 23) introductory note and blocks 7–8.

⁴⁶ Güneş Ünüvar, 'Space Resources and the Anatomy of Consensus at COPUOS' (Opinio Juris, 25 September 2026) <<https://opiniojuris.org/2026/09/25/space-resources-and-the-anatomy-of-consensus-at-copuos/>> accessed 30 September 2026.

⁴⁷ NASA, 'NASA Selects Companies to Collect Lunar Resources for Artemis Demonstrations' (3 December 2020) <<https://www.nasa.gov/news-release/nasa-selects-companies-to-collect-lunar-resources-for-artemis-demonstrations/>> accessed 30 September 2026.

VI. The difficult cases that an ownership rule must answer

Whole asteroids and extraction in place

The distinction between a body and an extracted resource becomes unstable when the proposed resource is the entire body. Suppose an operator encloses a small asteroid, redirects it and claims exclusive ownership of everything inside the enclosure. Calling this recovery does not remove Article II's express protection of celestial bodies.⁴⁸ There is no treaty size threshold below which that protection automatically disappears. The more completely the operation extinguishes independent access to the object, the less convincing a purely verbal distinction between extraction and appropriation becomes.

This does not require an invented universal ban on every change to an asteroid. The appropriate assessment should consider the operation's scale, consequences for access and scientific value, and whether the asserted entitlement encompasses the celestial body as such. Article I's protection of scientific investigation and access supplies relevant interests for that assessment.⁴⁹ A proposed rule permitting ownership of discrete extracted quantities can leave wholesale capture subject to separate multilateral agreement, rather than resolving a difficult question through an unsupported presumption.

Conversely, returning material to Earth should not be required for ownership. Water recovered into a spacecraft's tanks may be consumed near the asteroid, and domestic provisions such as Section 51303 contemplate use and sale without imposing terrestrial delivery.⁵⁰ The decisive requirement should be identification of the recovered quantity and lawful control over it. A claim to all water still inside an asteroid would require a different legal justification from ownership of measured water already recovered.

Priority conflicts and environmental consequences

Consider two licensed operators approaching the same deposit. A licence from one state cannot, by itself, extinguish the other state's freedom of use. Article IX requires due regard and provides for consultations where potentially harmful interference is anticipated.⁵¹ Neither the earlier licence nor the earlier public announcement necessarily establishes an international priority rule. Any agreed priority arrangement should therefore specify its duration, operational basis and effect on actors who have not accepted it.

⁴⁸ Outer Space Treaty (n 1) art II.

⁴⁹ Outer Space Treaty (n 1) art I.

⁵⁰ 51 USC § 51303.

⁵¹ Outer Space Treaty (n 1) art IX.

Environmental obligations complicate the proposed distinction between extraction and property. Article IX addresses harmful contamination of celestial bodies and adverse changes to Earth's environment resulting from the introduction of extraterrestrial matter.⁵² The Treaty does not prescribe a complete mining assessment procedure. Nevertheless, those obligations cannot be discharged responsibly without information about the activity's likely consequences. Prior assessment, monitoring and revision of operating conditions are defensible regulatory means of implementing them, rather than freestanding procedures expressly dictated by the Treaty.

The Hague proposals go further in detailing avoidance and mitigation of harmful impacts, prior review and adaptive responses.⁵³ A domestic regulator could require limits on debris creation, assessment of changed trajectories and preservation of scientifically valuable material. These recommendations address the irreversible character of some interventions. Their justification does not depend on assuming that an asteroid has the same ecology or legal status as a terrestrial mine.

Responsibility does not answer every property dispute

The Liability Convention distinguishes absolute liability for damage on Earth or to aircraft from fault-based liability for specified damage elsewhere, including damage to another state's space object.⁵⁴ It does not create a comprehensive adjudicatory system for rival claims to an asteroid deposit. Nor should pure resource depletion automatically be assumed to fit its definition of damage.⁵⁵ A claimant must establish the applicable legal basis and the relevant elements, not merely show that an operation was commercially disadvantageous.

Registration is equally limited. The Registration Convention concerns objects launched into Earth orbit or beyond and information concerning those objects.⁵⁶ Registering a mining spacecraft does not register ownership of an asteroid or establish a mineral concession. An additional resource registry would need an expressly defined legal effect.⁵⁷ Without that definition, a public record could misleadingly appear to settle rights that it merely records as asserted.

⁵² Outer Space Treaty (n 1) art IX.

⁵³ Hague Building Blocks (n 23) blocks 10–12.

⁵⁴ 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 arts II–III.

⁵⁵ Liability Convention (n 54) art I(a).

⁵⁶ Convention on Registration of Objects Launched into Outer Space (opened for signature 14 January 1975, entered into force 15 September 1976) 1023 UNTS 15 arts II and IV.

⁵⁷ Hague Building Blocks (n 23) blocks 14(a) and 18(a).

VII. A framework for conditional recognition

Connecting title to a lawful operation

A workable framework should begin by defining the object of ownership narrowly: identifiable material recovered through an authorised operation, together with products lawfully derived from it. Japan's link between ownership and compliance with the licensed activity plan offers a useful starting point.⁵⁸ Legislation should also distinguish the operator's property from that of contractors or customers. Those allocations can be contractual, provided the governing law identifies who initially acquires title and what may validly be transferred.

Authorisation should specify the proposed methods, expected quantities, duration and safeguards, with continuing supervision capable of responding to material changes.⁵⁹ A licence should not promise immutable operating conditions when risks remain uncertain. Equally, commercial planning requires published grounds for variation, reasoned decisions and a means of review. Luxembourg's provision for withdrawal when authorisation conditions cease to be satisfied illustrates why permission cannot be treated as unconditional.⁶⁰ Predictability can arise from a clear procedure for change rather than a guarantee that public regulation will remain frozen.

The consequences of unlawful extraction require deliberate treatment. The international responsibility of an authorising state does not automatically resolve whether every downstream buyer loses title. The ILC Articles address cessation and reparation for internationally wrongful acts, not a universal private-property code.⁶¹ Domestic legislation should therefore distinguish sanctions against the extractor, competing proprietary claims and protection of good-faith purchasers. Serious illegality must have consequences, but routine compliance failures should not create unspecified risks throughout an entire chain of transactions.

Recognition with safeguards against exclusion

States should negotiate recognition arrangements for resources acquired under published, comparable standards. The Hague proposals expressly contemplate mutual recognition of resource rights.⁶² Recognition should depend on verifiable acquisition and regulatory oversight, with refusal available for defined, serious defects. This would offer investors greater security

⁵⁸ Space Resources Act 2021 (Japan), art 5.

⁵⁹ Outer Space Treaty (n 1) art VI.

⁶⁰ Space Resources Law 2017 (Luxembourg), art 14(1).

⁶¹ Articles on State Responsibility (n 14) arts 30–31.

⁶² Hague Building Blocks (n 23) block 8.2.

while avoiding an unconditional obligation to accept rights created by whichever jurisdiction applies the weakest safeguards.

A shared notification system should identify operations, anticipated interference and changes in activity. Article XI's information obligations provide a treaty foundation.⁶³ The Hague proposals supply more detailed institutional possibilities.⁶⁴ The system should state clearly that entry supplies notice, not territorial ownership. Operational priority, if agreed, should expire when work ceases and remain subject to the rights of others. This would prevent speculative filings from replacing productive activity as the basis of control.

Safety arrangements should be proportionate to demonstrated risks and open to review. Article IX's due-regard requirement is reciprocal: newcomers must respect existing operations, while incumbents must consider later lawful uses.⁶⁵ Regulators should therefore examine cumulative exclusion, require reasons for boundaries and support consultation before competing operations become physically incompatible. The objective is predictable coexistence, rather than a permanent legal advantage attached to first arrival.

Participation and dispute settlement

Benefit-sharing should be designed with the same precision. Article I imposes a general benefit-and-interest obligation, but does not itself prescribe a royalty percentage or a global collecting authority.⁶⁶ Cooperation in research, access to samples and training can give practical content to that obligation.⁶⁷ For developing states, participation should include opportunities to shape standards and acquire technical capacity, rather than reliance on an assumption that commercial success elsewhere will eventually benefit everyone.

The Hague proposals include an international fund among possible benefits but reject compulsory monetary benefit-sharing within their proposed framework.⁶⁸ That choice is a proposal, not an authoritative interpretation of the Treaty. A future negotiated monetary mechanism remains possible. Its justification should specify contributors, beneficiaries, administration and accountability, while recognising the stronger commitments of Moon Agreement parties.⁶⁹ Distributive questions deserve express negotiation rather than resolution

⁶³ Outer Space Treaty (n 1) art XI.

⁶⁴ Hague Building Blocks (n 23) blocks 14 and 18.

⁶⁵ Outer Space Treaty (n 1) art IX.

⁶⁶ Outer Space Treaty (n 1) art I.

⁶⁷ Hague Building Blocks (n 23) block 13.1.

⁶⁸ Hague Building Blocks (n 23) block 13.

⁶⁹ Moon Agreement (n 16) art 11(5) and (7)(d).

through silence in national licensing statutes.

Dispute settlement should also distinguish contractual controversies from disputes over international obligations. A sales tribunal may decide whether a seller delivered valid title under the agreed law, but its jurisdiction cannot automatically extend to a third state objecting to exclusion from an asteroid. Even a treaty-based dispute mechanism cannot simply impose obligations on a non-consenting third state.⁷⁰ The Hague proposals accordingly contemplate adjudicatory and non-adjudicatory mechanisms.⁷¹ A practical framework should combine prompt technical consultation over interference with agreed procedures for legal disputes, preserving the distinction between private consent and state consent.

For India, the immediate legislative task is to turn the policy commitment into rules governing acquisition, oversight and recognition. Paragraph 4(13) already preserves applicable law and international obligations; that qualification should guide the legislation's operative provisions.⁷² India can support lawful commercial recovery while insisting that title to extracted material neither authorises territorial exclusion nor removes responsibility for the circumstances of extraction. That position connects its commercial ambitions with a credible contribution to multilateral governance.

VIII. Conclusion

A resource extracted from an asteroid may become the property of an operator under a national legal system. Whether that entitlement is internationally defensible depends on more than physical possession or a domestic legislative declaration. The Outer Space Treaty protects both use and non-appropriation, placing national activities within a framework of supervision, due regard and shared access. Its provisions support a distinction between recovered material and celestial territory, but they do not permit that distinction to excuse every method of recovery. The appropriate reconciliation is conditional recognition. Domestic law should define acquisition clearly; regulators should supervise the operation throughout its life; and states should develop recognition arrangements that preserve access, environmental safeguards and participation. Whole-body capture, enduring exclusion and rival priority claims require separate attention because commodity ownership alone cannot resolve them. Commercial certainty will remain incomplete until the law addresses both the legitimacy of extraction and the reach of the resulting title.

⁷⁰ Vienna Convention (n 5) art 34.

⁷¹ Hague Building Blocks (n 23) block 19.

⁷² Indian Space Policy 2023 (n 35) para 4(13).