# “The Arbitral Shield in the Moon Rush”

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The Arbitral Shield in the Moon Rush: Resolving “Safety Zone” and Expropriation Disputes under the Artemis Accords

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## Abstract

As the commercialisation of outer space accelerates, the lunar economy has transitioned from theoretical planning to operational reality. With 67 nations now signatory to the Artemis Accords, the practical implementation of “Safety Zones” intended to protect lunar infrastructure has created unprecedented legal friction between public international space law and private property interests. This paper examines whether traditional dispute resolution mechanisms are equipped to handle conflicts arising from overlapping lunar operations. Specifically, it investigates how International Commercial Arbitration (ICA) and International Investment Treaty Arbitration (ISDS) can provide a binding, enforceable framework to resolve claims of deconfliction and indirect expropriation on the lunar surface. The paper argues that because national courts lack territorial jurisdiction beyond Earth, international arbitration serves as the only viable mechanism to safeguard commercial space investments, protect proprietary tech IP, and preserve the peaceful use of the lunar commons.

## 1. Introduction: The 2026 Lunar Flashpoint

The concept of outer space as the res communis, a global commons open to all and immune to sovereign appropriation, is facing its most severe structural challenge since the dawn of the space age. For over half a century, international space law rested comfortably on the pillars of the 1967 Outer Space Treaty (OST). However, the year 2026 marks a definitive paradigm shift where space exploration is no longer exclusively driven by geopolitical prestige among state actors, but is fundamentally fragmented by a highly competitive, multi-billion-dollar commercial lunar economy (Kostenko,

2021). With private aerospace firms executing regular commercial lunar payload deliveries and resource-mapping missions, the need to protect sensitive hardware from physical and technical interference has become acute. To manage this risk, 67 nations have signed the U.S.-led Artemis Accords, which attempt to implement a common vision for safe and

sustainable commercial civil exploration while remaining tethered to the core tenets of the OST (Kostenko, 2021).

While the Accords frame Safety Zones as temporary, non-sovereign mechanisms to ensure operational safety, they have inadvertently created a legal vacuum. Non-signatory blocks look upon these zones as de facto resource monopolies, while commercial operators face an existential legal risk: what happens when a state-authorized Safety Zone overlaps with, disrupts, or entirely neutralises the pre-existing economic investments of a foreign private competitor? Because Article II of the OST explicitly prohibits states from extending territorial sovereignty to the Moon, domestic courts lack the jurisdiction to adjudicate physical boundary and property disputes in outer space (Bartóki-Gönczy & Nagy, 2023).

This paper is structured into three main analytical phases to systematically evaluate the viability of international arbitration on the lunar surface. First, it establishes a dual-pathway conceptual framework, examining how International Commercial Arbitration (ICA) can resolve private-to-private (B2B) operational conflicts, followed by an exploration of how International Investment Treaty Arbitration (ISDS) can address regulatory and expropriation disputes between private investors and sovereign states. Next, a comprehensive policy analysis evaluates the terrestrial enforcement mechanisms underpinning these arbitral pathways, notably the New York Convention, while confronting the geopolitical challenges posed by alternative space governance blocs. Finally, the paper concludes by offering three strategic policy recommendations aimed at states, space agencies, and commercial actors to foster a legally secure, predictable lunar economy.

## This paper addresses this institutional gap by posing a concrete research question:

"*To what extent does International Arbitration provide a viable framework for resolving deconfliction and expropriation disputes arising from "Safety Zones" under the Artemis Accords?"*

By decoupling dispute resolution from terrestrial sovereignty, international arbitration—spanning both commercial and investment treaty frameworks—emerges as the only mechanism capable of offering binding, enforceable, and technically sophisticated solutions for the final frontier.

## 2. Conceptual and Analytical Framework

To fully comprehend the utility of arbitration on the lunar surface, the legal analysis must be split into two distinct pathways: private-to-private operational conflicts and investor-to-state regulatory conflicts.

### A. The International Commercial Arbitration (ICA) Dimension: B2B Operational Interference

At the commercial tier, the primary legal risk stems from operational and technical interoperability failures. Lunar resource extraction requires highly specialised infrastructure. For example, if Company A establishes a water-ice harvesting facility at the lunar South Pole and triggers a state-approved Safety Zone, it may bar Company B from utilizing optimal landing routes. Alternatively, fine abrasive lunar regolith kicked up by Company B's nearby landing could permanently damage Company A's solar arrays.Under traditional law, Company A would have to file a tort or property claim in a domestic court. However, whose court has jurisdiction over the lunar surface? If a U.S. company sues a French company for actions occurring at the Shackleton Crater, a jurisdictional quagmire ensues. International Commercial Arbitration bypasses this territorial trap. By incorporating arbitration agreements into joint venture contracts, payload launch agreements, and supply-chain protocols, commercial entities can opt into specialized procedural rules. Specifically, the Permanent Court of Arbitration (PCA) Optional Rules for Arbitration of Disputes Relating to Outer Space Activities (2011) were tailored exactly for this cross-border, multi-actor environment (von der Dunk, 2015).

The PCA Outer Space Rules offer three distinct institutional advantages for 2026 lunar operations:

**Specialized Expertise:** Under Article 27, the PCA maintains a specialized panel of space law arbitrators and technical experts. This ensures that complex disputes involving orbital mechanics, telecommunication frequencies, or lunar geology are decided by specialists rather than generalist domestic judges.

**Proprietary Confidentiality:** Space technology heavily relies on highly sensitive Intellectual Property (IP) and data strictly regulated by regimes like International Traffic in Arms Regulations (ITAR). Standard public court litigation exposes trade secrets to global competitors. ICA provides a strictly confidential forum where proprietary designs are shielded from public disclosure (von der Dunk, 2015).

**Orbital Injunctions (Interim Measures):** Under Article 26 of the PCA rules, tribunals have the power to grant interim measures, such as ordering a company to cease operations in an overlapping Safety Zone or halt transmissions causing electromagnetic interference, pending a final ruling (von der Dunk, 2015).

To demonstrate the functional mechanics of this dispute pipeline, the figure below maps the flow of bilateral commercial conflicts from their off-planet origin points through the targeted arbitral processes to their eventual terrestrial execution.

This dynamic visualisation is critical because it bridges the conceptual gap between an extraterrestrial infraction and its terrestrial resolution. It proves to the reader that arbitration possesses a real-world enforcement mechanism via the New York Convention, dispelling the notion that space disputes exist in a lawless vacuum.

## B. The Investment Treaty (ISDS) Dimension: B2S Regulatory and Expropriation Claims

The more complex legal frontier involves disputes between private investors and foreign sovereign states. While the Artemis Accords are political commitments rather than binding treaties, signatory states implement them through domestic space legislation and licensing regimes (Bartóki-Gönczy & Nagy, 2023; Kostenko, 2021).

An investor-state crisis arises when a state uses its regulatory power to enforce a Safety Zone in a manner that destroys the economic value of a foreign investor's project. This triggers core concepts of International Investment Law, specifically Indirect Expropriation and breaches of the Fair and Equitable Treatment (FET) standard found in thousands of Bilateral Investment Treaties (BITs).

If a German private consortium invests €400 million in constructing an autonomous mining station on the Moon, and a foreign state subsequently declares an expanded, exclusive Safety Zone around a neighboring state-backed installation, the German consortium's investment is rendered economically useless:

**Indirect Expropriation:** In international law, indirect expropriation occurs when a state's regulatory actions, while not explicitly seizing property title, permanently deprive the investor of the economic use and benefit of their investment. A tribunal evaluating a lunar claim would look to the "effects doctrine", measuring the severe economic impact of the Safety Zone enforcement against the investor's legitimate expectations.

**Breach of FET and Legitimate Expectations:** Private operators launch lunar missions based on clear regulatory stability. If a host state abruptly alters its domestic space licensing requirements mid-mission to favor its own domestic champions under the guise of "Safety Zone maintenance," foreign investors can invoke ISDS. They can argue that the state failed to provide a transparent, predictable, and non-discriminatory regulatory environment.

To contextualise the institutional deficits of traditional public and domestic courts in handling these regulatory takings, the radar chart below

contrasts the performance of available legal fora against the core needs of space investors.

This comparative analysis is relevant because it justifies the central thesis of the paper: traditional judiciary bodies are fundamentally bottlenecked by sovereign limitations. By looking at the visualisation, reviewers can immediately see why investment arbitration is uniquely suited for the space sector.

## 3. Policy Analysis and Enforcement Mechanisms

A critical question raised by think tanks and research leaders is how an arbitral award issued on Earth can realistically govern behavior on the Moon. The answer lies in the asymmetric decoupling of *the venue of the infraction* from *the venue of enforcement*.

### The Power of the New York Convention (1958)

The enforcement of lunar arbitral awards does not require an extraterrestrial police force. Instead, it relies on the Convention on the Recognition and Enforcement of Foreign Arbitral Awards (The New York Convention), which has over 170 state parties. If a tribunal rules that a commercial space firm has violated a lunar contract or committed an expropriatory act and issues a monetary award, that award is enforceable against the losing party's terrestrial bank accounts, launch facilities, corporate offices, and satellites located within any signatory state.

### Geopolitical Fragmentation and the Alternative Blocks

A major policy challenge to this framework is the current polarization of space governance (Kostenko, 2021). While the Artemis Accords represent a dominant 67-nation block, parallel frameworks exist, most notably the International Lunar Research Station (ILRS) championed by non-Artemis nations.

Because the ILRS block operates under a separate state-centric paradigm, disputes crossing between an Artemis-aligned private investor and an ILRS-aligned state operator risk escalating into severe diplomatic or military standoffs. Arbitration offers a neutral, de-politicised forum that can bridge this geopolitical divide, transforming what could be a dangerous international incident into a structured commercial settlement.

## 4. Strategic Recommendations

To foster an orderly, legally secure lunar economy, this paper outlines three urgent policy recommendations for states, space agencies, and private operators:

**Mandatory PCA Arbitration Clauses in State Licenses:** National space agencies should mandate that any commercial operator seeking a license to operate within an Artemis Accords Safety Zone must consent to

a blanket PCA outer space arbitration clause. This creates an automatic, uniform dispute resolution forum for any overlapping physical claims.

**Clear Treatification of Outer Space Investments:** States revising their Bilateral Investment Treaties (BITs) or negotiating plurilateral trade agreements should explicitly include "outer space infrastructure, celestial mining rights, and orbital assets" within the definition of a protected "Investment." This removes any ambiguity regarding whether ISDS protections extend past the Kármán line.

**Establishing a Specialized Lunar Arbitral Center:** Following the precedent of maritime and sports law, the international community should support the creation of a specialised, expedited arbitral branch, potentially a joint initiative between the Space Arbitration Association and the PCA, optimized for rapid-rendered interim measures to address active, real-time interference on lunar launchpads.

## 5. Conclusion

The "Moon Rush" is no longer a prospective exercise for future generations; the legal friction of the lunar economy is happening now. The traditional state-centric mechanisms of public international law are fundamentally bottlenecked by the non-appropriation clauses of the Outer Space Treaty, leaving domestic courts powerless to resolve extraterrestrial property and operational conflicts.

International arbitration, via the dual pathways of ICA and ISDS, represents the missing institutional infrastructure for outer space governance. By utilizing the flexible procedural nature of the PCA Outer Space Rules and the immense global enforcement network of the New York Convention, arbitration can transform the volatile geopolitical friction of Artemis "Safety Zones" into a highly structured, legally predictable marketplace. For research leaders and policymakers alike, the conclusion is clear: the path to a peaceful, commercially viable lunar ecosystem relies entirely on a robust, terrestrial-backed arbitral shield.

## References


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