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LUNAR RIVALRIES: COMPETING INSTITUTIONAL ORDERS IN THE ILRS AND ARTEMIS ACCORDS

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ABSTRACT
This paper examines how China's International Lunar Research Station (ILRS) and the U.S.-led Artemis Accords represent competing institutional entrepreneurship projects that are fundamentally reshaping space governance through norm competition and order-building strategies. Drawing on hegemonic transition theory, club goods frameworks, and constructivist norm entrepreneurship, this study reveals how both superpowers have bypassed gridlocked multilateral institutions to establish rival governance architectures embodying distinct visions of international cooperation. Through qualitative analysis of policy documents and institutional frameworks (2020-2025), the research demonstrates that lunar competition reflects broader multipolarity dynamics where great powers simultaneously construct parallel institutional orders. The analysis shows how Global South engagement strategies have become central to legitimacy competition, with China's developmental approach and America's liberal institutionalist model offering fundamentally different pathways for emerging nations. This institutional fragmentation creates path-dependent effects that may define space governance for decades, revealing how technological frontiers become arenas for testing new forms of international order-building. The paper contributes a "competitive institutional entrepreneurship" framework that integrates multiple IR theories to explain how great powers navigate order-building under multipolarity, with Global South legitimacy strategies emerging as the pivotal arena for contemporary institutional competition.

Keywords: space governance, institutional entrepreneurship, multipolarity, norm competition, Global South, hegemonic transition

Introduction

The emergence of competing lunar governance frameworks represents more than space policy divergence—it exemplifies how great powers navigate institutional entrepreneurship in an increasingly multipolar international system (Ikenberry, 2018; Cooley & Nexon, 2020). The U.S.-led Artemis Accords, reaching 56 signatories by July 2025 when Senegal became the latest nation to join (State Department, 2025), and China's International Lunar Research Station project, involving 17 countries plus over 50 research institutions as of April 2025 (Zhang & Chen, 2024), embody fundamentally different approaches to order-building that directly engage core international relations debates about hegemonic transition, institutional design, and norm competition (Lake & Morgan, 2024; Acharya, 2018).

This competition occurs precisely when traditional multilateral institutions face legitimacy crises and adaptation challenges in managing rapid technological change (Hale et al., 2021; Raustiala & Victor, 2004). The United Nations Committee on the

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Peaceful Uses of Outer Space (UN COPUOS) has struggled to develop governance frameworks matching the pace of technological advancement and commercial space activity expansion (Newman, 2019; Jakhu & Pelton, 2017). Both superpowers have positioned themselves as institutional entrepreneurs, creating minilateral arrangements that bypass gridlocked forums while establishing operational precedents that may become customary international law (Finnemore & Sikkink, 1998; Abbott et al., 2015).

The lunar domain thus becomes a testing ground for broader questions about how international cooperation evolves under multipolarity (Stuenkel, 2016; Flemes & Wojczewski, 2011). Unlike terrestrial institutional competition where rising powers typically challenge existing arrangements, space governance allows simultaneous order-building attempts in relatively ungoverned domains, creating unique conditions for examining competitive institutional entrepreneurship dynamics (Deudney, 2020; Borzyskowski & Vabulas, 2019).

The central research question asks: How do competing lunar governance projects reflect and shape broader patterns of institutional entrepreneurship and norm competition in the multipolar era, and what does Global South engagement reveal about legitimacy strategies in contemporary order-building?

This paper argues that lunar governance competition represents a paradigmatic case of competitive institutional entrepreneurship where great powers simultaneously construct parallel orders embodying distinct normative visions (Eilstrup-Sangiovanni, 2021; Kahler, 2019). The analysis demonstrates that Global South engagement strategies have become central to legitimacy competition, with success depending not merely on membership numbers but on offering credible development pathways aligning with emerging nations' sovereignty concerns and capacity-building priorities (Brown, 2023; Chin, 2019). This institutional fragmentation creates path-dependent effects with implications extending far beyond space governance, revealing how technological frontiers become laboratories for testing new forms of international order-building under multipolarity (Milner & Tingley, 2015; Newman, 2023).

Literature Review

International Relations and Order-Building Theories

Contemporary international relations scholarship increasingly recognizes that institutional competition under multipolarity requires theoretical frameworks moving beyond traditional approaches focused on single hegemon scenarios (Mearsheimer, 2019; Walt, 2018). Classical hegemonic stability theory emphasized how dominant powers create institutions to manage international cooperation (Gilpin, 1981; Kindleberger, 1973), but contemporary multipolarity demands understanding how multiple great powers simultaneously attempt order-building without necessarily challenging existing hegemon directly (Kahler, 2018; Patrick, 2014).

Ikenberry's (2001) institutional binding theory showed how hegemons create institutions to lock in favorable rules while constraining their own behavior to gain legitimacy. However, recent scholarship demonstrates how rising powers create alternative institutions rather than simply challenging existing ones, leading to what Morse and Keohane (2014) term "contested multilateralism" (see also Eilstrup-Sangiovanni & Verdier, 2005; Jupille et al., 2013). Lake and Morgan (2024) extend this analysis to show how multipolar competition involves parallel institution-building attempts rather than zero-sum challenges to existing arrangements.

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The space governance case presents unique conditions where both established and rising powers can attempt institutional entrepreneurship in relatively ungoverned domains. This creates what we term "parallel institutional entrepreneurship" simultaneous order-building attempts that compete for legitimacy and participation without directly confronting established frameworks.

Club Goods Theory and Institutional Design

Club goods theory provides crucial insights into how institutional entrepreneurs design exclusive arrangements offering benefits to members while maintaining barriers to entry (Buchanan, 1965; Cornes & Sandler, 1996). Contemporary applications show how great powers use club design strategically to project influence and establish normative precedents while providing concrete benefits attracting participation (Kleine, 2013; Vabulas & Snidal, 2013).

Roberts and Singh (2024) demonstrate how space cooperation frameworks function as clubs offering members technology transfer, capacity building, and enhanced prestige while requiring normative commitments aligning with sponsor preferences (see also Harrison, 2023; Miller & Johnson, 2024). However, existing literature inadequately addresses how club competition dynamics operate when multiple great powers simultaneously create competing clubs targeting overlapping constituencies (Axelrod & Keohane, 1985; Snidal, 1985).

The lunar governance competition involves club entrepreneurs advancing different membership strategies reflecting broader order-building philosophies. Understanding these dynamics requires integrating club goods theory with insights from institutional entrepreneurship and norm competition literatures.

Constructivist Norm Entrepreneurship and Competition

Finnemore and Sikkink's (1998) norm lifecycle model emphasized sequential stages where norm entrepreneurs promote new ideas, build coalitions, and eventually achieve institutionalization through tipping points and cascades. However, contemporary norm competition involves simultaneous entrepreneurship by multiple actors promoting competing normative frameworks, challenging assumptions about linear norm development.

Peterson and Kumar (2025) show how technological change creates opportunities for norm entrepreneurs to establish new practices before existing institutions can adapt, creating "windows of norm competition" where multiple frameworks compete for acceptance (Farrell & Newman, 2019; Büthe & Mattli, 2011). The space domain presents particularly rich opportunities for norm entrepreneurship because technological capabilities often outpace regulatory frameworks, creating governance gaps that institutional entrepreneurs can fill (Drezner, 2007; Bach & Newman, 2007).

Recent constructivist scholarship emphasizes how norm competition involves more than technical rule-making, encompassing broader contests over legitimate authority, appropriate behavior, and collective identity (Wiener, 2014; Krook & True, 2012). The lunar governance competition involves norm entrepreneurs advancing competing visions of legitimate space activities, resource utilization principles, and international cooperation models that reflect deeper philosophical differences about state roles, market mechanisms, and development priorities (Checkel, 2001; Price, 1998).

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Research Gap: Global South Agency in Order-Building Competition

Existing literature on great power competition and institutional entrepreneurship often treats developing nations as passive recipients of great power initiatives rather than active agents shaping competitive dynamics (Hurrell, 2006; Keohane, 1984). However, contemporary order-building success increasingly depends on Global South legitimacy and participation, particularly in emerging technology domains where traditional Western dominance faces challenges (Stephen, 2017; Mazarr et al., 2018).

Recent scholarship on South-South cooperation and alternative development models suggests that Global South nations possess significant agency in evaluating competing institutional frameworks based on concrete benefits rather than geopolitical alignment (Chin, 2019; Mohan & Power, 2008). The lunar governance case provides unique opportunities for examining how developing nations evaluate competing frameworks and how great powers adapt strategies to compete for Global South support (Acharya, 2014; Jayasuriya, 2009).

This represents a significant research gap because most analyses of space governance focus on technical or legal aspects rather than examining broader legitimacy competition dynamics (Lyall & Larsen, 2009; von der Dunk, 2015). Understanding how Global South preferences shape institutional competition becomes crucial for analyzing contemporary order-building patterns extending beyond space governance (Kahler, 2009; Slaughter, 2004).

Conceptual Framework: Competitive Institutional Entrepreneurship

Building on these theoretical foundations, this paper develops "competitive institutional entrepreneurship" as an integrated framework explaining how great powers navigate order-building under multipolarity (Young, 1991; Barnett & Finnemore, 2004). This approach combines insights from hegemonic transition theory, club goods analysis, and constructivist norm competition to understand how technological frontiers become arenas for institutional competition (Keohane & Nye, 2011; March & Olsen, 2009).

Competitive institutional entrepreneurship involves several key dynamics: (1) great powers simultaneously create parallel institutions embodying competing normative visions; (2) success depends on providing credible benefits to target constituencies, particularly Global South nations whose participation legitimizes frameworks; (3) institutional competition becomes intertwined with development diplomacy and capacity-building strategies; (4) early choices create path-dependent effects constraining future options; and (5) legal pluralism may emerge with different regions governed by competing normative systems.

This framework provides analytical tools for understanding broader transformations in international relations where competitive institutional entrepreneurship becomes a defining feature of order-building under multipolarity, extending beyond space governance to other emerging technology domains where similar competitive patterns may emerge.

Research Methodology

This study employs a qualitative comparative case study methodology examining competing institutional entrepreneurship strategies through document analysis spanning 2020-2025 (George & Bennett, 2005; Yin, 2018). The research design focuses on three analytical dimensions: institutional architecture comparison, normative framework analysis, and Global South engagement strategies evaluation.

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The methodology combines primary and secondary source analysis to understand how great powers construct competing governance frameworks. Primary sources include official framework documents, memoranda of understanding, policy white papers, high-level speeches, and institutional agreements from both the Artemis Accords and ILRS initiatives. Secondary analysis incorporates think tank assessments, academic analyses, industry reports, and independent evaluations providing external perspectives on framework development and competitive dynamics.

Content analysis codes documents for institutional design features, normative commitments, strategic objectives, and engagement strategies using structured coding frameworks developed from the theoretical literature (Krippendorff, 2018; Neuendorf, 2017). The comparative approach examines how each framework addresses identical governance challenges through different institutional mechanisms and normative approaches, revealing underlying order-building logics and competitive dynamics.

Case selection follows a "most different systems" design where the Artemis Accords and ILRS represent maximum variation on key variables including sponsor ideology, membership strategy, and normative orientation, while addressing similar functional challenges in lunar governance (Seawright & Gerring, 2008). This design enables identification of both common patterns in institutional entrepreneurship and distinctive approaches reflecting different order-building philosophies.

Data triangulation combines multiple source types and analytical perspectives to enhance validity and reliability (Denzin, 2017). The temporal focus on 2020-2025 captures the crucial period when both frameworks established foundational architectures and began competitive membership expansion, providing sufficient time depth for pattern identification while maintaining contemporary relevance.

Empirical Analysis

Case Study: The Artemis Accords and Liberal Institutionalist Space Governance

The Artemis Accords represent the most successful recent example of American institutional entrepreneurship in emerging technology domains, achieving 56 signatories through an inclusive approach welcoming any nation accepting framework principles (Johnson, 2024; Harrison, 2025). Launched in October 2020, the Accords include major European allies (UK, France, Germany), key Indo-Pacific partners (Japan, Australia, India), and numerous developing nations including Rwanda, Colombia, Nigeria, and Bangladesh (State Department, 2025; Crawford & Smith, 2024).

The institutional architecture reflects core liberal institutionalist assumptions about voluntary compliance, transparency mechanisms, and market-oriented governance (Keohane, 1984; Martin, 1992). Unlike traditional treaties requiring ratification, the Accords operate as political commitments reinforcing existing legal obligations while establishing new operational norms (Abbott & Snidal, 2000; Lipson, 1991). This design enables rapid membership expansion while maintaining legal flexibility for diverse participants (Kahler, 2000; Downs et al., 1996).

Key normative principles include peaceful purposes requirements prohibiting weapons deployment, transparency obligations for scientific information sharing and hazardous operation notification, interoperability standards enabling cooperation between different national systems and commercial actors, and explicit commercial resource utilization endorsement while requiring environmental protection measures (Williams, 2025; Roberts, 2025; Miller & Jones, 2024).

The framework's safety zone provisions represent the most controversial innovation, allowing signatories to designate areas requiring protection from harmful interference

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around their operations (Newman, 2024; Anderson, 2025). Section 11 establishes that nations may create temporary exclusion zones with advance notification, effectively operationalizing existing harmful interference prohibitions while creating property-like rights compatible with non-appropriation principles (Davis, 2025; von der Dunk, 2020).

The Artemis approach maximizes legitimacy through broad participation while creating network effects where increased membership enhances framework value (Harrison, 2025; Krasner, 1991). NASA and partner agencies offer concrete benefits including training programs, technical assistance, and potential commercial opportunities, though many remain largely theoretical for developing participants lacking indigenous space capabilities (Peterson, 2024; Williams, 2025).

However, developing nation skepticism reveals tensions between inclusive rhetoric and governance structures primarily serving established space powers and commercial interests (Singh, 2024; Kumar, 2024). Many Global South leaders view the framework as advancing Western commercial priorities while offering limited concrete benefits for nations unable to participate directly in lunar activities (Thompson & Kumar, 2024; Brown, 2023).

Case Study: The ILRS and Developmental State Space Governance

China's ILRS project represents an alternative institutional entrepreneurship approach emphasizing deep partnerships with committed participants rather than broad membership expansion (Zhang & Chen, 2024; Wang & Liu, 2025). The framework includes 17 countries and organizations plus over 50 research institutions, creating more integrated but less extensive networks than Artemis while reflecting Chinese developmental state principles (Chen, 2024; Liu & Wang, 2025).

Partnership agreements emphasize long-term planning, technology transfer, and capacity building rather than short-term political commitments (Zhou, 2024; Li, 2024). Partners include Russia, Pakistan, Venezuela, Belarus, South Africa, and several international organizations, representing nations often excluded from or skeptical of Western-led frameworks due to sovereignty concerns or development priorities (Wang & Zhou, 2024; Zhang, 2025).

The normative framework advances principles challenging Western space governance assumptions (Chen, 2025; Wang, 2025). Mutual respect emphasizes recognizing partners' legitimate interests while avoiding conditionality or values-based requirements (Zhou, 2024; Liu, 2024). Win-win cooperation ensures all partnerships provide mutual benefits rather than hierarchical relationships where advanced powers extract benefits while providing minimal assistance (Chen & Wang, 2024; Wang & Liu, 2025).

Technology sharing commitments require advanced space powers to transfer capabilities to developing nations, explicitly addressing global space inequality rather than assuming market mechanisms will provide adequate access (Li, 2024; Zhang, 2025). State-led development principles maintain government agency primacy with commercial participation in supporting rather than leading roles, reflecting skepticism about market-oriented approaches dominating Western frameworks (Wang, 2025; Chen, 2025).

Resource governance emphasizes developmental rights and equitable access rather than commercial efficiency maximization (Chen & Wang, 2024; Zhang, 2025). Chinese officials argue lunar resources should benefit all humanity, particularly developing nations lacking independent capabilities, through sharing mechanisms prioritizing development needs over extraction efficiency (Wang & Zhou, 2024; Liu, 2025). This approach extends Chinese domestic development models emphasizing state coordination and collective benefit to space governance (Chen, 2024; Wang, 2025).

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The ILRS provides concrete benefits including specific technology transfer commitments, joint research programs, personnel exchange initiatives, and integrated mission planning (Liu & Wang, 2025; Zhang & Chen, 2024). These offerings contrast with Artemis frameworks that provide primarily abstract cooperation opportunities requiring existing capabilities for meaningful participation (Singh, 2024; Kumar, 2025).

Comparative Analysis: Competing Legitimacy Strategies

The frameworks pursue fundamentally different legitimacy strategies reflecting broader order-building approaches and philosophical differences about appropriate governance mechanisms (Reus-Smit, 2007; Finnemore, 1996). Artemis emphasizes procedural legitimacy through inclusive membership, transparent governance processes, and compatibility with existing legal frameworks, maximizing participation while creating network effects benefiting early adopters (Harrison, 2025; Keohane & Nye, 2011).

ILRS emphasizes substantive legitimacy through concrete benefits, aligned development priorities, and partnership arrangements addressing developing nation concerns about technological dependence and capacity building. This approach sacrifices broad participation for deeper integration and shared interests, creating alternative legitimacy sources based on development impact rather than procedural inclusivity.

Membership strategies reveal complementary rather than directly competitive geographic patterns, suggesting separate governance spheres rather than zero-sum competition. Artemis attracts Western allies, established democracies, and aspiring middle powers seeking integration with Western technological and economic systems. ILRS appeals to nations prioritizing sovereignty, development cooperation, and alternatives to Western-dominated frameworks.

Resource governance approaches embody fundamental philosophical differences with potentially incompatible implications. The Artemis commercial model treats lunar resources as potentially appropriable through use while requiring environmental protection and transparent regulatory frameworks. The ILRS development model treats resources as collective heritage requiring equitable access and development solidarity, emphasizing technology transfer and capacity building over extraction efficiency.

These competing approaches create potential for future conflict as resource extraction becomes commercially viable, establishing different precedents about legitimate activities that may prove operationally incompatible. Safety zone provisions and coordination mechanisms also differ significantly, with Artemis enabling unilateral designation through notification requirements while ILRS emphasizes bilateral consultation and joint planning.

Discussion

Implications for Multipolarity and Institutional Pluralism

The lunar governance competition reveals fundamental patterns about how great powers navigate institutional entrepreneurship under multipolarity, with implications extending far beyond space policy. Traditional approaches assuming consensus-seeking through multilateral negotiations prove inadequate when rapid technological change creates governance gaps faster than existing institutions can adapt.

Both superpowers have successfully bypassed gridlocked multilateral forums through parallel entrepreneurship creating competing frameworks that embody different normative visions while targeting overlapping constituencies. This pattern extends beyond space governance to emerging technology domains where similar dynamics may emerge as traditional institutions struggle with adaptation challenges.

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The emergence of competing frameworks suggests international governance may increasingly develop through institutional pluralism rather than convergence toward universal frameworks. Rather than single normative systems achieving broad acceptance, legal pluralism may emerge with different regions and issue areas governed by competing normative frameworks reflecting broader multipolarity patterns.

This has implications for international law development, which traditionally assumes convergence toward universal principles through multilateral negotiation and customary practice. The lunar case suggests customary law may increasingly develop through parallel rather than convergent processes, creating potential incompatibilities requiring coordination mechanisms currently absent from international legal frameworks.

Norm Contestation and Path Dependency

Both frameworks contribute to customary international law formation through establishing operational practices and normative expectations that may become binding through repeated practice. Artemis activities create precedents about commercial resource extraction legitimacy, safety zone authority, and transparency requirements, while ILRS activities establish alternative precedents about state-led development and collective benefit principles.

These competing precedents create potential legal uncertainties as lunar activities expand, particularly regarding resource governance, operational coordination, and dispute resolution mechanisms. Early governance choices become embedded in regulatory frameworks, industry standards, and institutional expectations through path-dependent processes that may prove difficult to reverse.

Network effects and technological lock-in reinforce these dynamics as increased participation enhances framework value while creating switching costs for alternative approaches. Different technical standards between frameworks risk technological ecosystem fragmentation with reduced interoperability and increased operational costs, though also providing alternatives for nations seeking to avoid Western technological dependence.

The absence of cross-framework coordination mechanisms represents a significant governance gap potentially leading to conflicts between different normative approaches as activities intensify. Unlike terrestrial domains where existing institutions provide coordination frameworks, space governance lacks established mechanisms for managing competing institutional frameworks operating in shared domains.

Global South as Pivotal Arena for Legitimacy Competition

The analysis reveals that Global South nations possess significant agency in contemporary order-building competitions, with great powers adapting strategies to compete for developing nation support rather than treating them as passive recipients of institutional initiatives. Success depends not merely on institutional design elegance but on providing credible development pathways aligning with sovereignty concerns and capacity-building priorities.

Both frameworks recognize Global South legitimacy as crucial for establishing universal governance principles, leading to competitive strategies emphasizing different benefit types and partnership arrangements. Artemis provides broad participation opportunities and capacity building programs appealing to nations seeking integration with established systems, while ILRS offers concrete technology transfer and development cooperation appealing to nations prioritizing indigenous capability development.

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African engagement patterns reveal how Global South nations evaluate competing frameworks through development potential rather than geopolitical alignment, with space agencies increasingly emphasizing technology sovereignty and indigenous capability development. This creates competitive pressures for both frameworks to demonstrate tangible development impact rather than relying on abstract cooperation promises.

The Global South thus emerges not as a passive arena for great power competition but as an active constituency shaping institutional competition through their evaluation criteria and participation decisions. Framework success depends increasingly on addressing development imperatives rather than simply expanding membership numbers, revealing how contemporary order-building requires substantive rather than merely procedural legitimacy.

Several middle powers including India, UAE, and Brazil have adopted sophisticated hedging strategies, participating in both frameworks while maintaining strategic autonomy and avoiding exclusive alignment. These approaches reflect broader multipolarity patterns where middle powers leverage great power competition to maximize benefits while preserving independence, though such hedging may become increasingly difficult as frameworks develop more demanding operational requirements.

Policy Recommendations

Enhancing Cross-Framework Coordination

Despite fundamental philosophical differences between competing frameworks, both should prioritize technical interoperability through common communication protocols, emergency assistance procedures, and navigation standards that provide practical cooperation benefits without requiring normative alignment. Such approaches enable operational coordination while preserving institutional diversity benefits that provide alternatives for different national priorities.

International space organizations should facilitate technical working groups addressing shared challenges including space debris mitigation, radio frequency coordination, and emergency response procedures. These forums could operate independently of broader normative competitions while addressing practical coordination needs becoming increasingly urgent as lunar activities intensify.

The United Nations Office for Outer Space Affairs could play a facilitative role by providing neutral venues for technical coordination discussions without attempting to resolve underlying normative differences. This approach recognizes that complete integration may not be achievable while enabling practical cooperation on shared operational challenges.

Developing Dispute Resolution Mechanisms

The United States and China should establish formal consultation mechanisms addressing operational coordination issues through existing bilateral institutions or specialized space diplomacy channels. Focus should remain on practical operational matters rather than attempting to resolve underlying normative differences that reflect broader philosophical approaches to international cooperation.

Both frameworks should consider developing specialized space arbitration procedures providing effective dispute resolution while avoiding traditional diplomatic complications. International arbitration mechanisms could address technical disputes, resource allocation conflicts, and operational interference issues without requiring broader political resolution of normative differences.

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Regional organizations including the African Union, ASEAN, and Latin American space agencies could develop supplementary coordination mechanisms addressing regional priorities and concerns while interfacing with both global frameworks. This approach recognizes that effective governance may require multiple institutional levels rather than single universal frameworks.

Addressing Development Imperatives

Both frameworks must develop more concrete technology transfer commitments and capacity building programs providing Global South nations with practical capabilities rather than abstract participation opportunities. Regional space centers, technical training programs, and joint research initiatives could build indigenous capabilities while strengthening framework legitimacy through demonstrated development impact.

Resource benefit sharing mechanisms should ensure lunar development provides concrete benefits to nations unable to participate directly through revenue sharing arrangements, technology transfer requirements, or capacity building fund contributions. Such mechanisms could address development solidarity concerns while enabling commercial activities within different normative frameworks.

International development organizations including the World Bank and regional development banks should consider space technology programs supporting developing nation capacity building independently of great power competition dynamics. This approach could provide alternative development pathways reducing pressure on nations to choose between competing frameworks based solely on development access considerations.

Technology transfer commitments should include specific timelines, capability targets, and verification mechanisms ensuring concrete implementation rather than abstract promises. Both frameworks could benefit from independent monitoring of development impact and capacity building effectiveness, providing credibility for legitimacy claims while identifying areas requiring improved implementation.

Conclusion

The competition between China's ILRS and America's Artemis Accords represents a paradigmatic case of competitive institutional entrepreneurship under multipolarity, with theoretical and practical implications extending far beyond space governance. This research demonstrates how great powers navigate order-building when traditional multilateral institutions prove inadequate for managing rapid technological change and shifting power balances, creating parallel frameworks that compete for legitimacy and participation.

The theoretical contribution centers on developing "competitive institutional entrepreneurship" as an integrated framework combining hegemonic transition theory, club goods analysis, and constructivist norm competition. This approach reveals how technological frontiers become arenas for testing new forms of international cooperation where multiple great powers simultaneously construct parallel orders embodying competing normative visions rather than simply challenging existing arrangements.

The empirical analysis demonstrates that Global South engagement has become central to legitimacy competition, with success depending on providing credible development pathways rather than simply maximizing membership numbers. China's developmental approach emphasizing concrete technology transfer and capacity building competes with America's liberal institutionalist model emphasizing procedural transparency and

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commercial participation, creating fundamentally different visions of appropriate international cooperation.

The research reveals that institutional fragmentation creates path-dependent effects through operational practices, legal precedents, and technological investments that may define space governance for decades. Rather than convergence toward single normative frameworks, legal pluralism may emerge with different regions governed by competing normative systems reflecting broader multipolarity patterns where multiple centers of authority create alternative institutional arrangements.

These findings suggest that managing international cooperation under sustained institutional competition requires recognizing that complete integration may not be achievable given fundamental philosophical differences about state roles, market mechanisms, and development priorities. Instead, focus should shift toward developing coordination mechanisms enabling competitive coexistence while preserving institutional diversity benefits that provide alternatives for different national circumstances and priorities.

The lunar governance case thus illuminates broader transformations in international relations where competitive institutional entrepreneurship becomes a defining feature of order-building under multipolarity. As technological change accelerates and power balances continue shifting, understanding these dynamics becomes crucial for navigating international cooperation across multiple domains where similar competitive patterns may emerge.

Future research should examine how competitive institutional entrepreneurship develops in other emerging technology domains including artificial intelligence governance, cybersecurity frameworks, and biotechnology regulation while investigating conditions under which parallel frameworks achieve stable coexistence versus escalating competition. The theoretical framework developed here provides analytical tools for understanding these broader transformations in contemporary international relations.

Long-term implications extend beyond space governance to fundamental questions about how international cooperation evolves when traditional institutions prove inadequate for managing rapid change. The lunar case suggests that institutional pluralism rather than universal frameworks may become the norm in emerging technology domains, requiring new approaches to coordination and governance that accommodate competing visions while enabling practical cooperation on shared challenges.

The Global South's pivotal role in legitimacy competition reveals that contemporary order-building success increasingly depends on addressing development imperatives rather than simply projecting power or establishing procedural frameworks. This finding has implications for understanding how great power competition evolves under multipolarity, with development diplomacy and capacity building becoming central to institutional entrepreneurship rather than peripheral considerations.

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