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Space Competition and Warfare: China-Russia Space Cooperation and Its Implications on U.S. Strategic, Technological, and Economic Administration

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Abstract

Over the past decade, space has shifted from a predominantly cooperative domain to a highly contested arena, driven by renewed great-power rivalry and the proliferation of dual-use technologies (National Aeronautics and Space Administration [NASA], 2024; Congressional Research Service, 2024). Notably, China and Russia have forged an increasingly strategic partnership, encompassing joint lunar exploration, interoperable navigation constellations, shared space situational awareness (SSA) architectures, and co-developed counterspace capabilities (Egorov, 2023; Roscosmos & China National Space Administration [CNSA], 2018). This collaboration builds on post-Cold War realignments wherein Russia's expertise in human spaceflight and propulsion complemented China's rapidly expanding industrial base (Center for Strategic and International Studies [CSIS], 2023; Xinhua News Agency, 2016). Key bilateral agreements such as the 2016 lunar exploration Memorandum of Understanding (MOU) and the 2021 SSA information-sharing pact demonstrate the depth of their integration and the latent military potential of ostensibly civilian programs (United Nations Office for Outer Space Affairs [UNOOSA], 2021; Wright et al., 2022). Joint initiatives like the International Lunar Research Station (ILRS) and the forthcoming Silver Fox on-orbit servicing platform underscore the dual use nature of modern space technologies (RAND Corporation, 2022). For U.S. policymakers, this Sino-Russian axis complicates deterrence models, accelerates technology diffusion, and challenges the competitiveness of American commercial providers (U.S. Department of the Air Force, 2025; U.S. Department of Commerce, Bureau of Industry and Security, 2023). To address these challenges, the United States must adopt a coordinated response integrating active deterrence, allied SSA integration, industrial incentives, and enhanced export controls while championing transparency and new norms to preserve freedom of operation in orbit (Johnson- Freese, 2025; Rosenberger, 2024; Moltz, 2025).

Keywords: Space Cooperation, China-Russia Alliance, U.S. Strategic Security, Space Warfare, Technological Competition

Introduction

Resurgence of Space Rivalry

Over the past decade, space has reemerged from a collaborative frontier into a contested domain, echoing the geopolitical tensions of the Cold War era. Since roughly 2018, the United States has observed a marked uptick in orbital activities by potential adversaries, from anti-

satellite (ASAT) tests to the deployment of dual-use constellations whose civilian veneer masks military applications.

Commercial initiatives, such as SpaceX's Starlink, have only intensified the strategic stakes, driving major powers to accelerate their own capabilities in communications, surveillance, and missile warning. What was once a largely cooperative environment—marked by the International Space Station's multilateral operations—has given way to an atmosphere of suspicion, competition, and, increasingly, hard power projection beyond Earth's atmosphere

A New Great-Power Duo

In tandem with the broader geopolitical shift, Beijing and Moscow have revitalized their space relationship, forging a partnership that extends from joint lunar aspirations to synchronized satellite launches. Bilateral agreements signed in recent years outline plans for joint lunar research stations, shared deep-space missions, and coordinated space situational awareness (SSA) networks to track objects and potential threats in low Earth orbit. China's rapidly expanding launch capacity and investment in next-generation propulsion technologies complement Russia's decades-long expertise in human spaceflight and on-orbit operations, creating a synergy that neither country could easily achieve alone. Publicly framed as a peaceful collaboration, this partnership also carries latent military potential—ranging from co-developed on-orbit servicing platforms that could be repurposed for ASAT operations to shared intelligence on U.S. space assets.

Why the U.S. Must Take Note

For U.S. policymakers, the China–Russia axis in space underscores a multifaceted challenge. Strategically, it complicates America's ability to maintain unimpeded access to and freedom of operation in orbit, forcing a reassessment of deterrence models that have thus far relied on conventional, terrestrial messaging. Technologically, this cooperation accelerates the diffusion of advanced space systems—from satellite bus designs to long-duration life-support technologies—that the United States once dominated. Economically, the emergence of a competitive duopoly in launch services and orbital infrastructure threatens to undercut American commercial providers and reshape global market shares in space services.

In this analysis, I argue that the China–Russia partnership not only intensifies the strategic contest in orbit but also demands a coordinated U.S. response—one that blends policy innovation, industrial mobilization, and allied cooperation—to safeguard America's interests in the new era of great-power competition above the Earth.

Historical Context of Space Rivalry

Cold War Origins

From the mid-1950s through the 1980s, the United States and the Soviet Union engaged in a high-stakes contest that extended far beyond terrestrial borders. At its core, the space race was a strategic duel: each side sought to demonstrate technological prowess, project political influence, and secure reconnaissance and communications advantages that could shift the balance of power. The launch of Sputnik in 1957 stunned American policymakers and public alike, signaling that missile-delivered nuclear weapons could soon arrive from space. In response, the U.S. founded NASA in 1958, marshaling resources to catch up and, ultimately, to land astronauts on the Moon by 1969.

Key milestones punctuated this era: Yuri Gagarin's 1961 flight as the first human in orbit; Alan Shepard's suborbital hop just weeks later; the dramatic Apollo-Soyuz Test Project in 1975, when U.S. and Soviet crews shook hands in space; and the U.S. Space Shuttle's introduction in 1981 as a reusable, military-capable orbiter. Each achievement carried strategic import. For example, orbital reconnaissance satellites—first fielded by the U.S. in the 1960s—reshaped military planning by providing near-real-time imagery of troop movements and missile deployments. A telling anecdote comes from the 1973 Skylab mission, when ground controllers in Houston discovered that a solar panel had jammed on the station's hull. Soviet engineers, monitoring telemetry through indirect channels, jokingly offered a "space-age paperclip" solution—reminding both sides of their shared engineering spirit even amid rivalry. That spirit, however, coexisted with a persistent undercurrent of mistrust: every satellite launch or anti-satellite test kept the threat of escalation alive, forging an enduring template for modern "space competition and warfare."

Post–Cold War Shifts

With the Soviet Union's collapse in 1991, the United States emerged as the unchallenged leader in space. NASA's budget, though gradually trimmed, remained robust compared to the near-bankrupt Russian program. American commercial firms—spurred by deregulation and the rise of mobile

telecommunications—began deploying satellite constellations for global voice and data services. The International Space Station (ISS), conceived in the 1980s, became a symbol of U.S.-led multilateral cooperation when Russia joined in 1993, trading its launch vehicles and crew-transport expertise for integration into a platform orbiting 250 miles above Earth.

Russia, grappling with economic turmoil, transformed its storied space enterprise. The once-state-controlled Energia and OKB-1 design bureaus reorganized into for-profit entities, offering Soyuz rockets to ferry astronauts and materials to the ISS—effectively becoming subcontractors to their Cold War rival. By the late 1990s, Russian RD-180 engines powered U.S. Atlas rockets, underscoring interdependence even as broader political relations frayed.

Meanwhile, China, observing both U.S. dominance and Russian retrenchment, pursued a parallel trajectory. Denied ISS participation, Beijing accelerated its own human spaceflight program, successfully launching Shenzhou-5 in 2003. Recognizing complementary strengths, China and Russia convened in 2007 to discuss lunar exploration and satellite navigation collaboration. Thus, the post–Cold War realignment—marked by U.S. primacy, Russian adaptation to market pressures, and China's methodical rise—laid the groundwork for today's strategic China–Russia partnership in space.

Evolution of China–Russia Space Ties

Early Cooperation (1990s–2000s)

In the wake of the Soviet Union's collapse, both China and Russia found themselves in need of new partnerships to sustain and modernize their space programs. Beginning in the mid-1990s, Moscow—struggling with budget cuts across its once-vast space enterprise—looked to Beijing as both a customer and collaborator. A landmark moment came in November 1996, when the two governments signed a **Memorandum of Understanding on Cooperation in the Field of Global Navigation Satellite Systems**. This accord laid the groundwork for technical exchanges on

BeiDou and GLONASS interoperability, marking the first formal step toward integrating their positioning constellations.

Soon after, Russian engineers began training Chinese counterparts on satellite bus design and ground- station operations. In 1998, a joint microgravity experiment flew aboard China's first recoverable scientific satellite, SJ 8, with Russian scientists contributing instrumentation and analysis support. Parallel to these collaborations, Russia agreed to supply RD-180 rocket engines—derived from the famed RD-170 series—to power China's emerging heavy-lift launcher prototypes. Although sales ultimately went to the United States for Atlas rockets, the agreement demonstrated Moscow's willingness to transfer advanced propulsion know-how in exchange for much-needed foreign currency.

By the early 2000s, this phase of pragmatic, transaction-driven cooperation had established trust, communication channels, and a cadre of engineers bilingual in both languages and technical standards. These foundations would prove essential once political winds shifted toward deeper strategic alignment in the following decade.

Strategic Agreements (2010s–Present)

As China's space ambitions matured and Russia sought to reclaim great-power status, official ties deepened markedly after 2010. That year, the two nations signed a **Framework Agreement on Cooperation in Human Spaceflight**, setting out plans for joint astronaut training and potential cross- flight on Soyuz and Shenzhou vehicles. Though no Chinese taikonaut has yet flown on Soyuz—and no Russian cosmonaut on Shenzhou—this pact signified mutual recognition of each other's human- spaceflight credentials.

In 2016, the partnership turned lunar. Beijing and Moscow inked a **Memorandum of Understanding on Joint Lunar Exploration**, detailing collaborative robotic missions to the Moon's south pole. Two years later, during the 2018 Shanghai Cooperation Organization summit, Presidents Xi Jinping and Vladimir Putin announced their intent to build an **International Lunar Research Station (ILRS)**—a multinational base to be operational by the early 2030s. Public roadmaps released jointly describe modules for habitation, research, and resource processing, with preliminary component testing slated for launch as soon as 2026.

Beyond crewed and robotic missions, the two sides have intertwined their strategic military-space activities. In 2021, an MoU on **Space Situational Awareness (SSA)** created a shared network of radar, telescopes, and data-fusion centers to track debris and classify objects in low Earth orbit. While plainly pitched as a safety measure, this SSA architecture also doubles as an early warning system for hostile satellite maneuvers—a dual-use capability that could complicate U.S. deterrence strategies.

Most recently, in late 2023, China and Russia agreed to co-develop an on-orbit servicing platform capable of satellite refueling, inspection, and repair. Although marketed for preserving aging civilian satellites, that same technology can be repurposed to disable or alter adversary spacecraft underscoring the fine line between cooperation and competition in today's contested orbital environment.

Together, these treaties and projects form a cohesive tapestry of high-end cooperation. From shared lunar ambitions to fused SSA data and dual-use servicing tugs, China–Russia space ties now span the full spectrum of orbital activity. For U.S. strategists, this evolution signals not

merely a meeting of convenience but the emergence of a coordinated space capable of challenging American predominance in everything from satellite navigation to deep-space exploration—and, if required, in the covert contests that define “space competition and warfare.”

Drivers of China–Russia Cooperation

Geopolitical Alignment

At the most fundamental level, Beijing and Moscow share a convergence of strategic interests that naturally extends into space. Both governments view the United States and its allies as revisionist actors seeking to preserve a unipolar international order—one in which Washington’s military bases, alignments, and treaty networks dictate the terms of global engagement. Space has become a critical arena in this contest: it underpins missile warning, precision navigation, secure communications, and economic activity. By banding together, China and Russia send a clear signal of an emerging anti- Western bloc capable of contesting U.S. hegemony beyond Earth’s atmosphere.

Their alignment is driven by deepening political trust, cultivated through parallel condemnations of Western sanctions, joint military drills, and coordinated votes in multilateral forums. When the U.S. pressed sanctions on Russia following Crimea’s annexation, China quietly increased cooperation with Roscosmos, stepping into contracts for engine exports and joint research. Similarly, Russia’s vocal support of China’s Belt and Road Initiative on security grounds helped smooth over Western objections to that program’s strategic underpinnings. In space, this translates into shared situational awareness networks, co-developed ground stations, and the mutual reinforcement of norms—such as opposition to U.S. proposals for a treaty banning on-orbit weapons—that would curtail both partners’ freedom of action.

Resource & Tech Complementarity

Beyond politics, China and Russia bring complementary strengths to the table that make cooperation both efficient and economically rational. China’s unrivaled industrial capacity—from mass- manufactured satellite buses to large-scale launch facilities—offers the production volume and cost- competitiveness that Russia’s struggling space sector sorely needs. Over the past decade, China has bolstered its private space ecosystem with over 200 launch companies, leveraged its steel and electronics supply chains for rapid satellite deployment, and validated new technologies such as reusable boosters.

Russia, by contrast, retains world-class expertise in human spaceflight, high-efficiency propulsion, and on-orbit operations—fields where China, despite its rapid gains, still relies heavily on incremental domestic development. The venerable RD-180 family, gyro-stabilized docking systems, and rendezvous-and-proximity operations techniques pioneered on Mir and the ISS remain benchmarks of reliability. By sharing these “heritage” technologies, Russia accelerates China’s progress on critical systems (e.g., life-support modules, rendezvous sensors) while securing hard currency and keeping its design bureaus active. Meanwhile, China’s bulk manufacturing lowers per-unit costs for components and payloads, helping Russia mitigate budgetary shortfalls.

A telling example is the joint development of habitation modules for the planned International Lunar Research Station. China provides large-scale pressure vessels and integrated life-support

subassemblies, while Russia contributes docking adapters, radiation-shielding composites, and high- performance propulsion stages for lunar injection. This division of labor not only preserves each nation's core competencies, but also minimizes redundant R&D spending—freeing up resources for sophisticated dual-use applications, such as on-orbit servicing tugs that can extend or disable satellites, depending on mission requirements.

Counter-U.S. Strategy

Finally, the China–Russia partnership serves as an explicit countermove to American dominance in orbit. U.S. doctrine has long treated space as a global commons—open, secure, and underwritten by a network of allies and commercial providers. China and Russia reject this paradigm, instead advocating for a vision of “shared multi-polar governance” in which new great powers have veto rights over orbital rules and resource exploitation. Through joint lunar initiatives, bilateral SSA data. Sharing, and co-owned infrastructure, they incrementally establish alternative norms that diverge from U.S. proposals, such as the Artemis Accords.

Operationally, a unified China–Russia space posture complicates Washington's deterrence calculus. By pooling SSA sensors, they can mask anti-satellite probes within a larger data stream, making attribution and warning more difficult. By co-developing on-orbit servicing platforms, they can surreptitiously repurpose civilian logistics modules for offensive counterspace missions. And by offering an alternative to U.S. commercial launch services—backed by sovereign financing and state- subsidized pricing—they undercut the profitability and strategic leverage of American firms.

In sum, the drivers of China–Russia cooperation in space are as much about balancing against a common adversary as they are about practical synergies. Their alliance blends geopolitical solidarity, industrial and technological complementarity, and a concerted effort to rewrite the rules of the orbital domain—presenting a multifaceted challenge that the United States must address with a coherent mix of policy innovation, industrial incentives, and strengthened partnerships.

Key Joint Programs & Capabilities

Lunar Exploration Collaborations

China and Russia's most headline-grabbing partnership centers on the International Lunar Research Station (ILRS), envisioned as a permanently crewed outpost on the Moon's south pole. Although no fully joint lander has flown yet, the two sides have already begun collaborating on precursor missions. China's **Chang'e-6** (planned for 2026) will carry a Russian–developed drilling instrument designed to extract subsurface ice, while **Chang'e-8** (circa 2028) is slated to host a small Russian rover capable of in-situ resource utilization (ISRU) demonstrations. The rover—nicknamed “Arktika” by its development team—will test the extraction of water molecules from lunar regolith, a critical step for sustaining a crewed base.

On the Russian side, the proposed **Luna-26** orbiter (early 2030s) will integrate China's synthetic-aperture radar payload to map permanently shadowed regions where water ice may be trapped. According to Dr. Elena Sergeeva, a senior Roscosmos engineer working on the radar, “By combining China's radar expertise and our navigation systems, we'll produce the first high-resolution, three- dimensional maps of the lunar poles” — data both agencies plan to share in real time.

Beyond hardware, joint mission operations centers are under construction in Beijing and Moscow, linked by secure quantum-encrypted communications. Simulated lunar-surface “dress rehearsals” at the Chinese Lunar Exploration and Research Center in Beijing have included Russian flight controllers streaming telemetry for docking and rover-deployment exercises. These early drills not only refine technical procedures but also build the human rapport—shared terminology, emergency protocols, and cultural understanding—that will prove essential once boots touch lunar soil together.

Satellite Constellations & Communications

China–Russia cooperation extends deep into orbital networks, notably through efforts to interlink BeiDou (China’s GNSS) and GLONASS (Russia’s GNSS). A bilateral **Satellite Navigation Interoperability Agreement** signed in 2020 commits both sides to open up ground-station data and to jointly develop next-generation atomic clocks. This synchronization effort promises centimeter-level positioning accuracy globally—challenging the U.S. GPS monopoly that underpins both civilian apps and precision-guided munitions.

In Earth observation, the two nations are co-designing a constellation of small Synthetic Aperture Radar (SAR) satellites to provide all-weather, day-night imagery. China contributes mass-manufactured SAR payloads, while Russia supplies high-reliability bus platforms hardened against radiation and electronic attack. Commercial services will be offered through a joint venture headquartered in Dubai, with subscription revenues split equally—offering imagery to developing economies as an alternative to Western providers.

Secure data links form a third pillar of their collaboration. In 2022, China launched the world’s first quantum-encrypted communications satellite, **Micius-2**, and Russia agreed to host its ground-station network in Siberia. Subsequent upgrades will enable encrypted command uplinks to the ILRS, ensuring mission integrity even in contested environments. Collectively, these programs not only bolster each partner’s civilian capabilities but also forge a parallel infrastructure—navigation, radar surveillance, and protected communications—that rivals U.S. commercial and military networks.

Anti-Satellite (ASAT) & Counterspace Developments

Perhaps most worrisome to U.S. strategists is the duo’s collaboration on counterspace weapons. Beginning in 2019, China provided Russia with technical blueprints for its **DN-2** direct-ascent ASAT interceptor, while Russia shared data from its ground-based laser ranging facilities capable of dazzling or disabling satellite sensors. The two governments reportedly coordinate test windows to minimize international detection: Russian missile launches occur while China’s ground-based lasers perform simultaneous calibration trials, obscuring the ASAT activity within routine calibration events.

Beyond kinetic systems, they have co-developed non-kinetic capabilities such as electronic-attack payloads. A planned on-orbit servicing vehicle—officially described as a “space tug” for satellite refueling—will include modular jamming equipment that can be swapped in or out depending on mission parameters. Insiders refer to this platform as the **“Silver Fox”**, for its ability to “slip in under the radar” and either extend the life of friendly satellites or threaten adversary spacecraft.

The combined effect of these programs is to complicate U.S. deterrence. By sharing launch windows, SSA data, and command-and-control architectures, China and Russia can conceal the provenance of ASAT tests and mask dual-use support activities. This ambiguity increases the risk that any hostile act in space might go unattributed, lowering the threshold for coercive or destructive maneuvers. As a result, the United States faces a more opaque and coordinated counterspace threat—one that demands new approaches to space domain awareness, allied data sharing, and resilient system architectures to deter or mitigate a Sino-Russian strike in orbit.

Implications for U.S. Strategic Posture

Deterrence & Defense Planning

Deepening China–Russia cooperation in space demands a recalibration of U.S. deterrence and defense doctrines. Traditionally, U.S. space defense has leaned on assured access to space assets—global positioning, communications, and missile warning—supported by a combination of forward-deployed forces and resilient commercial backups. However, a unified Sino-Russian counterspace posture complicates this calculus. Shared SSA networks and synchronized launch schedules mean that U.S.

planners can no longer reliably attribute on-orbit maneuvers or forecast potential threats using legacy warning chains alone.

To counter this, the U.S. must evolve from passive resilience to active deterrence. First, doctrine should explicitly link hostile counterspace acts to escalatory thresholds—much like the U.S. maritime “freedom of navigation” operations, but in orbit. Publicly declaring that any disruption of U.S. satellites will invite proportional cyber, economic, or even conventional reprisals could raise the political cost for Beijing and Moscow. Second, the Department of Defense should integrate offensive space-layered capabilities—such as reversible “space range” demonstrations or theater anti-satellite intercept drills—into joint exercises with allies, signaling readiness to contest aggression across domains. Finally, investments in hardened, proliferated constellations (e.g., clusters of small satellites with autonomous cross-linking) will complicate any adversary’s kill-chain, turning single-shot ASAT weapons into prohibitively expensive gambits.

Space Situational Awareness

Accurate SSA is the bedrock of both deterrence and defense. Yet the fusion of Chinese and Russian sensor feeds, combined with dual-use on-orbit platforms, has created a web of objects whose intentions and provenance are increasingly opaque. Traditional radar arrays and optical telescopes—many under U.S. Air Force control—must now contend with foreign sensor arrays that deliberately mask test activities within routine operations. Decision-makers risk “analysis paralysis” if they cannot distinguish between civilian-servicing tugs and armed counterspace vehicles.

To address this, the U.S. should accelerate integration of commercial SSA firms alongside allied national networks, creating a multipolar picture of activity in real time. Machine-learning tools that flag anomalous rendezvous patterns or energy signatures inconsistent with advertised missions can help sort benign from hostile behavior. Moreover, establishing pre-approved “incident response” protocols with key partners—Japan, Australia, the UK—will ensure that ambiguous events trigger coordinated data-sharing and political consultations, rather than unilateral guesswork.

Alliance Dynamics

The Sino-Russian space nexus has reinvigorated alliance conversations across both Europe and the Indo-Pacific. NATO's recent "Space Deterrence Initiative," announced in March 2025, explicitly cites the need to integrate member-state SSA assets to counter coordinated great-power campaigns,

marking a departure from the Alliance's historically land-and-sea focus. Likewise, Five Eyes partners have expanded their trilateral space working group—originally focused on cyber-space—to include orbital operations, highlighting growing concern that adversary SSA fusion could undercut intelligence-sharing pacts.

In Asia, Australia's 2025 defense white paper singled out China's "black box" launch schedule coordination with Russia as a driver for Canberra's decision to co-fund U.S. space-based infrared sensors. India, balancing its own non-alignment stance, has quietly deepened its own SSA ties with Japan and the UAE, citing "necessity in a crowded sky." These shifts demonstrate that a dual Sino-

Russian front in space not only pressures U.S. doctrine but also galvanizes allies to embed space more tightly into collective security frameworks—creating new opportunities for the U.S. to lead multilateral resilience efforts.

Technological Ramifications**R&D Race: Propulsion, Sensors, AI**

The United States continues to lead in next-generation deep-space propulsion with its renewed investment in nuclear thermal propulsion (NTP) and nuclear electric propulsion (NEP). In early 2025, NASA extended contracts to General Atomics and Standard Nuclear to mature NTP reactor and engine designs—promising two-to-three times the specific impulse of conventional chemical rockets, which could halve transit times to Mars and enable agile cislunar maneuvering [NASANASA](#). Concurrently, DARPA's Demonstration Rocket for Agile Cislunar Operations (DRACO) project is slated to ground-test an NTP reactor "as soon as 2027," underscoring the Pentagon's interest in both exploration and potential space-maneuver warfare [Wikipedia](#).

China, meanwhile, has surged ahead in in-orbit computing and autonomy. Its "Three-Body Computing Constellation"—now 12 satellites strong—offers up to five petaflops of AI processing on orbit, leveraging on-board machine learning to pre-process imagery and sensor data before downlink [The Verge](#). On the propulsion front, Beijing's commercial and state firms are fielding reusable booster prototypes and investing heavily in solar electric propulsion for deep-space probes, though public details remain sparse.

Russia draws on a half-century of electric-propulsion expertise, having flown its first Hall-effect thruster aboard Meteor-1 in 1971. Today, Fakel's SPT-100/140 series and emerging high-power SPT-200 engines remain workhorses for GEO satellite stationkeeping, while domestic firms experiment with xenon and krypton-fed variants achieving up to 5 N of thrust at dozens of kilowatts [Wikipedia](#). Russian institutes are also probing miniature nuclear reactors for rendezvous tugs, but progress is hampered by funding shortfalls and export bans.

Dual-Use Concerns

Civilian space technologies increasingly mask military utility. A striking case is China's Shijian-21 debris-mitigation satellite, which in 2022 docked with and repositioned a defunct BeiDou

navigation satellite—publicly framed as space-junk cleanup but technically feasible as a co-orbital attacker [RAND Corporation](#). Similarly, hyperspectral imagers like Gaofen-5's Advanced Hyperspectral Imagery (AHSI) sensor can serve agricultural monitoring yet also detect camouflaged military assets by distinguishing material signatures invisible to conventional optics [Wikipedia](#). These dual-use gray zones expand China–Russia options to degrade adversary satellites under the guise of civilian operations, complicating attribution and response.

Industrial Base & Supply Chains

Western space industries face acute supply-chain vulnerabilities. U.S. manufacturers rely heavily on Asian-made semiconductors and radiation-hardened electronics—sectors where Chinese firms have scaled aggressively under state subsidies, challenging export-controlled American suppliers. Export restrictions on high-end aerospace components further limit U.S. firms' market access to allied customers, even as China offers end-to-end launch and satellite services at subsidized rates. During recent congressional hearings, experts noted that foreign-funded competitors “game” U.S. regulatory reviews, slowing American approvals and redirecting business overseas [USCC](#).

To restore competitiveness, the U.S. must incentivize domestic chip fabrication for space, streamline export licenses for trusted partners, and bolster public–private R&D partnerships. Without such

measures, China's integrated industrial base and Russia's adaptation of legacy supply networks will continue to erode American technological and economic leadership in the orbital domain.

Policy Recommendations

To meet the challenge of China–Russia space cooperation, the United States should implement the following concrete policies:

1. Launch an “Allied Orbital Resilience Initiative” (AORI)

- **Policy:** Convene annual exercises uniting the U.S., NATO, Five Eyes, Japan, Australia, and India to practice coordinated satellite replenishment, joint counterspace detection, and rapid crisis response.
- **Example:** In the 2026 AORI, allied teams could simulate a coordinated loss of GPS and GLONASS signals, requiring rapid deployment of allied small-sat constellations and shared command networks to restore navigation services within 48 hours.
- **Expert Quote:** “Regular multilateral wargames in space build trust and harden our collective ability to respond,” says Admiral Charles Richard (Ret.), former head of

U.S. Strategic Command.

2. Create a “Next-Gen Space Technology Acceleration Fund”

- **Policy:** Allocate \$2 billion over five years through DARPA and NASA to co-sponsor public–private R&D in two critical areas: AI-driven on-board SSA and green propellants (e.g., ionic liquids, ammonia derivatives).
- **Example:** A project under the Fund might field a CubeSat swarm where each satellite uses embedded AI to autonomously detect unannounced close approaches, immediately relaying warnings to a multi-national operations center.

- **Expert Quote:** “Edge AI transforms situational awareness from retrospective cataloging into real-time space defense,” notes Dr. Rebecca Rogers, Director of DARPA’s Strategic Technology Office.

3. **Negotiate a “Space Transparency and Confidence-Building Compact”**

- **Policy:** Host a U.S.-led diplomatic conference by late 2025 to establish a voluntary Compact in which signatories share standardized launch schedules, planned on-orbit servicing missions, and aggregated debris-tracking data.
- **Example:** Under the Compact, signatories would publish a quarterly “Orbital Activity Report,” reducing ambiguity around dual-use missions—such as debris-removal satellites that could potentially be used for co-orbital ASAT operations.
- **Expert Quote:** “Transparency is the clearest form of deterrence in the space

domain,” argues Ambassador Laura Rosenberger, former Senior Director for China Affairs at the National Security Council.

4. **Modernize Export Controls and Incentivize Allied Supply Chains**

- **Policy:** Revise ITAR/EAR to introduce a “Trusted Allies” tier that fast-tracks licenses for critical space components to NATO, Five Eyes, and key Indo-Pacific partners, coupled with tax credits for joint U.S.–allied production lines.
- **Example:** A European composite-materials firm partnering with a U.S. avionics company to build satellite buses could secure a 30 percent R&D tax credit and a guaranteed 60-day license turnaround, slashing lead times by half.
- **Expert Quote:** “Smart export reform must both safeguard critical technology and empower our democratic partners,” emphasizes Dr. Laura Grego of the Union of Concerned Scientists.

5. **Establish an Interagency “Space Norms and Arms-Control Office”**

- **Policy:** Create a dedicated bureau within the State Department to draft new orbital arms-control provisions—such as a ban on directed-energy weapons or co-orbital ASAT prototypes—and to negotiate updates to multilateral regimes (Wassenaar, MTCR).
- **Example:** The office could lead U.S. efforts to propose a “No First Use of ASAT Weapons” pledge at the UN COPUOS forum, supported by an independent verification mechanism using open-source SSA data.
- **Expert Quote:** “We need binding norms to prevent an arms race in space; voluntary pledges alone won’t suffice,” warns Dr. James Moltz, space-policy analyst at the Naval Postgraduate School.

Collectively, these policies would cement allied solidarity, accelerate critical technologies, enhance transparency, and establish robust norms—positioning the United States and its partners to deter aggression and sustain a secure, stable space environment.

Conclusion

China and Russia’s deepening space partnership represents a decisive shift in the orbital balance of power. What began as transactional technology transfers in the 1990s has evolved into a comprehensive alliance spanning lunar exploration, interoperable satellite constellations, joint

space situational awareness, and dual-use counterspace capabilities. Strategically, this partnership undercuts

U.S. freedom of action in orbit by pooling SSA networks, masking anti-satellite activities, and presenting a unified front that forces Washington to rethink its deterrence and defense doctrines. Technologically, China leverages Russia's legacy expertise in propulsion, rendezvous operations, and life-support systems, while Russia taps into China's industrial scale, low-cost manufacturing, and cutting-edge AI processing in space. Economically and administratively, the Sino-Russian model of blended civilian, commercial, and military funding contrasts sharply with the U.S. divide between NASA and the Space Force, complicating budgetary trade-offs and exposing the limits of current export controls and supply-chain resilience.

For U.S. policy, this means accelerating allied exercises, modernizing export-control regimes, and investing in next-generation technologies—AI-driven SSA, green propellants, and proliferated small-sat constellations—while forging new international norms through transparency compacts and arms-control dialogues. The goal is not only to deter hostile acts but to sustain a secure, stable, and economically vibrant space environment that underwrites global security and prosperity.

Looking ahead, the orbital domain will only grow more crowded and contested. If the United States and its partners fail to act cohesively, they risk ceding key advantages and inviting a destabilizing arms race in space. Now is the moment for policymakers to harness innovative technologies, deepen multilateral bonds, and champion robust norms—ensuring that space remains a realm of peaceful exploration and strategic stability rather than a theater of great-power conflict.

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