China In Our Backyard: Volume II

Pulling Latin America into China's Orbit

How the PLA Weaponizes the Ground Architecture of the Space Silk Road in Venezuela, Brazil, Bolivia, Argentina, and Chile

---

THE SELECT COMMITTEE ON THE STRATEGIC COMPETITION BETWEEN THE UNITED STATES AND THE CHINESE COMMUNIST PARTY

EXECUTIVE SUMMARY

Given the People's Republic of China's (PRC) expanding space infrastructure in Latin America, the Select Committee sought to better understand the military implications of China's access to and control of these sites. A review of Beijing's planning documents and open-source survey of its space infrastructure in Latin America uncovered that China is leveraging ostensibly civilian and commercial space cooperation to advance the People's Liberation Army's (PLA) global Space Domain Awareness (SDA). These facilities are not simply isolated scientific projects. Instead, these sites form an integrated, dual-use network strengthening China's ability to monitor, control, and potentially disrupt adversary space and military operations.

This report serves as the second installment of the Select Committee's investigations into Chinese activity in Latin America. After reviewing Chinese language reports, news articles, government documents, and academic research, the Select Committee determined the PRC takes advantage of Latin American countries to advance the PLA's SDA, further bolstering the PLA's intelligence collection and counterspace capabilities. Our investigation into space facilities in Latin America makes the following findings:

Finding 1: The PRC's "Belt and Road" Spatial Information Corridor into Latin America is driven by top-down national directives as a part of China's larger space strategy. This strategy, outlined by PRC strategic documents combined with Military-Civil Fusion and national defense mobilizations laws, frames space infrastructure as essential to China's national security, informationized warfare, and space superiority.

Finding 2: Beijing recognized the importance of Latin America for Space Domain Awareness and targeted the region for expansion of space capabilities. The PRC Latin American planning documents explicitly elevate space cooperation as a pillar of China-Latin America relations, while China-Latin American multilateral forums provide the diplomatic and legal cover for the long-term presence of Chinese-operated space facilities. Notably, the PRC's latest space strategy explicitly categorizes "space cooperation" as a primary pillar, inviting Latin American countries to participate in various Chinese space programs.

Finding 3: The PRC secured access to an extensive network of dual-use space infrastructure across Latin America. At least eleven PRC-linked space facilities consisting of ground stations, radio telescopes, and Satellite Laser Ranging sites are situated across Argentina, Venezuela, Bolivia, Chile, and Brazil. The sites possess dual use capabilities and are linked to numerous PLA-linked entities.

Finding 4: Beijing uses space infrastructure in Latin America to collect adversary intelligence and strengthen the PLA's future warfighting capabilities. These sites in Latin America are an essential part of the PRC's larger

SDA network providing near-continuous global surveillance, supporting counterspace operations, and enabling the terminal guidance required for advanced weapons systems.

Background

In November 2009, then–People Liberation Army (PLA) Air Force Commander Xu Qiliang described the 21st century military power competition as defined by the information and space domains, becoming the "new commanding heights in international strategic competition."[1] Since Xu's assessment, the PLA has steadily and strategically expanded its space presence, both within the PRC's borders and beyond them.

Xu's remarks underscore a central feature of contemporary competition: control of space-based infrastructure is now essential to military effectiveness and national power. The global security and economic environments rely heavily on space-based infrastructure. Satellites enable communications, precision navigation, remote sensing, and data transmission that underpin both civilian activity and military operations.[2] For the PRC, these systems are not simply commercial or civilian tools; they are central to how the military operates and projects power. Space capabilities support long-range coordination, situational awareness, and sustained operations far from China's immediate periphery.[3]

To support these goals, the PRC has launched over 1,000 satellites and has invested heavily in the ground infrastructure needed to operate them throughout their orbits.[4] This includes tracking, telemetry, and command (TT&C) stations that allow China to monitor and manage space assets on a global scale, not just for domestic use or only when those assets' orbits take them over China. And such TT&C capabilities are just as useful for commanding military satellites as they are for controlling non-military satellites.

In recent years, China has extended its space infrastructure overseas. By launching satellites for foreign partners and building ground facilities in those partners' territory, particularly in Latin America, Beijing frames its involvement as assistance with disaster response, weather forecasting, satellite-assisted navigation, communications, and scientific cooperation.[5] Through offering other countries the use of its satellite networks, launch services, and space infrastructure, China enhances the resilience and global coverage of its space architecture. Chinese officials also argue that such cooperation reduces partner countries' reliance on Western technology.[6]

These overseas facilities expand China's global space tracking and control network, reinforcing the PLA's ability to operate in space during both peacetime and conflict. At the same time, it draws partner nations more deeply into its technological ecosystem, creating long term strategic and economic dependencies on Chinese technology.

Finding 1: The PRC's "Belt and Road" Spatial Information Corridor into Latin America is Driven by Top-Down National Directives as a Part of China's Larger Space Strategy.

The PRC's "Belt and Road" Spatial Information Corridor ["一带一路"空间信息走廊], also referred to as the Space Silk Road [空间丝绸之路],[7] is a subset of China's Belt and Road Initiative (BRI), a massive infrastructure project composed of various development and investment projects across the globe.[8] The BRI Spatial Information Corridor aims to assist countries in developing space capabilities by improving recipient countries' satellites, satellite bases, telescopes, among other space infrastructure.[9]

China's global space development has supported over 80 space infrastructure projects built outside of China; these range across space facilities, satellite manufacturing, launch services, data sharing, and technical training.[10] These space facilities, many of which are operated by Chinese nationals and are linked to Chinese satellites, are integrated into China's larger space ecosystem.[11] By integrating satellite networks to provide remote sensing, communications, and navigation services to partner regions, the Spatial Information Corridor creates a global ecosystem of overseas ground infrastructure inextricably linked to China.

The PRC's expansion of the Space Information Corridor is more than a plan to increase economic connectivity; rather it is a long-term strategy to establish a "space-earth integrated information network."[12] Under China's Military-Civil Fusion (MCF) policy and National Defense Mobilization Laws, the PLA maintains a hand in and access to space infrastructure abroad.[13] Chinese commercial aerospace firms are legally required to include CCP bodies with oversight authority, creating formal pathways for state access to intellectual property, facilities, equipment, and personnel across commercial and state-owned enterprises alike.[14] Chinese aerospace firms deployed to build space infrastructure abroad, like the China Satellite Launch and Tracking Control General (CLTC) for example, are undeniably tied to the Information Support Force (ISF), a PLA body tasked with both maintaining the military's information flow and protecting the security of these integrated resources.[15] This commitment provides the foundational legal and strategic justification for all necessary activities, including the construction of a military-grade surveillance network.

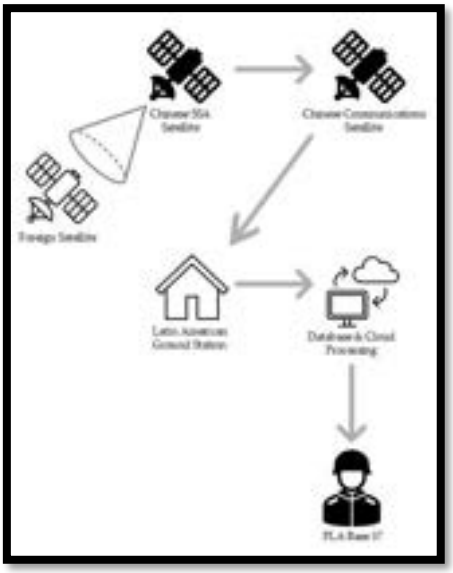
The PRC has actively developed its space strategy for more than a decade. China's 2016 Space White Paper set forth an ambitious plan for spaceports and infrastructure, aiming to make the country a "strong space power" [航天强国] by 2045.[16] China's latest space white paper, released in 2021, highlights Beijing's intent on becoming "a leader in scientific and technological self-reliance and strength" [科技自立自强的引领者] and a "defender of national security" [国家安全的维护者].[17] At the core of this vision is the expansion and modernization of launch sites, ground stations, and TT&C networks, with a focus on supporting a

broad spectrum of missions and building out the industrial as well as research and development backbone for space activities.[18] These planning documents showcase that China's space strategy is inseparable from its national security.

The PRC's ground based space infrastructure is the basis of the PLA's doctrine of "informationized warfare" [信息化战争] where victory is achieved by leveraging information systems to lead and coordinate combat, conduct precision strikes, integrate joint operations across all services, and dominate the information space while disrupting the enemy's command and control capabilities.[19] Key aspects of informationized warfare, including communications and technological dominance, C4ISR, long-range precision strikes, anti-access and area-denial (A2/AD), and joint force integration, rely on multi-domain space capabilities. These capabilities enable system-of-systems operations, situational awareness, and coordinated command across land, sea, air, space, and cyberspace.[20]

At the center of informationized warfare is the ability to know what is happening within the space domain. This defense capability is called Space Domain Awareness (SDA)[21] and it involves the detection, tracking, characterizing, and understanding of all objects and activities in space, from satellites and debris to natural forces, to ensure the safety, security, and sustainability of space operations.[22] The PRC operates an extensive space surveillance architecture designed to detect, monitor, and assess satellites across all Earth orbits.[23] This system is composed of diverse sensors, such as optical telescopes, radar installations, and other tracking technologies, enabling China to carry out missions.[24] This includes intelligence gathering, counterspace operations, ballistic missile warning, ensuring the safety of space operations, diagnosing satellite irregularities, and tracking orbital debris.[25] PLA Base 37 is the PRC's lead element for SDA, including overseeing the identification, tracking, and analysis of foreign space objects.[26] Through its role integrating and analyzing data gathered about the space domain, PLA Base 37 provides the entire PLA a picture of what is happening in space, which in turn drives PLA operations on earth and in space.[27]

Figure 1: Overview of the PRC's SDA Process Using Ground Stations



The PRC gains SDA by tasking a Chinese Space Situational Awareness satellite to observe foreign objects in space, such as foreign satellites. The collected data is relayed to a Chinese communications satellite and subsequently transmitted to a ground station in Latin America. From there, the information is forwarded by terrestrial networks to a data and cloud processing center, where it is analyzed and then delivered to the end user, PLA Base 37.

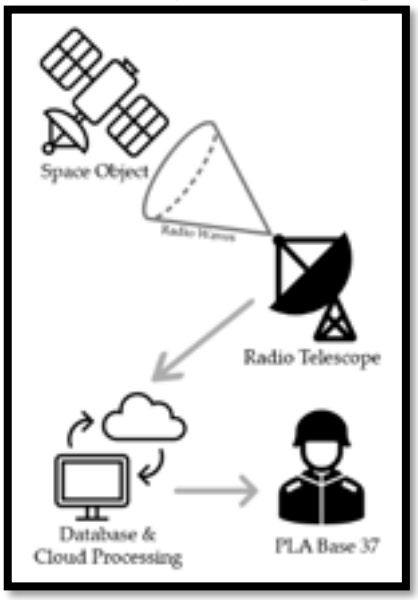
The PLA seeks superiority in the space domain, working to protect its own use of space while limiting China's adversaries' ability to use the space domain.[28] Control over information within the space domain facilitates this. As this information becomes more valuable, the reliance of military operations on space systems will increase, making it increasingly necessary to

maintain space access and ensure mission assurance. In this context, the PLA is steadily increasing the number of satellites available for military use, enhancing its SDA capabilities, while also accelerating the development of capabilities to disrupt enemy space utilization through various methods, including anti-satellite (ASAT) weapons and electromagnetic jamming weapons,[29] thereby improving its overall ability to achieve "space superiority."

To achieve its SDA capabilities and its goal of "space superiority," the PRC views ground-based space infrastructure as an integral part of its strategy. The PRC uses satellites in Space Situational Awareness satellites in low Earth orbit (LEO) to gather information on objects in LEO and geosynchronous Earth orbit (GEO).[30] This includes operational objects such as non-Chinese satellites and non-operational objects such as space debris. Those Chinese SSO satellites then transmit the data to ground-based infrastructure such as satellite ground stations. This infrastructure creates an "information umbrella" [信息伞], which allows the PRC to gather massive amounts of information, allowing one to achieve information superiority.[31] The PLA sees this as enabling its "informationized warfare" if it distributes the right information to the right users at the right time and in the right way, [32] thereby gaining an advantage in command and decision-making with that advantage translating into operational superiority.

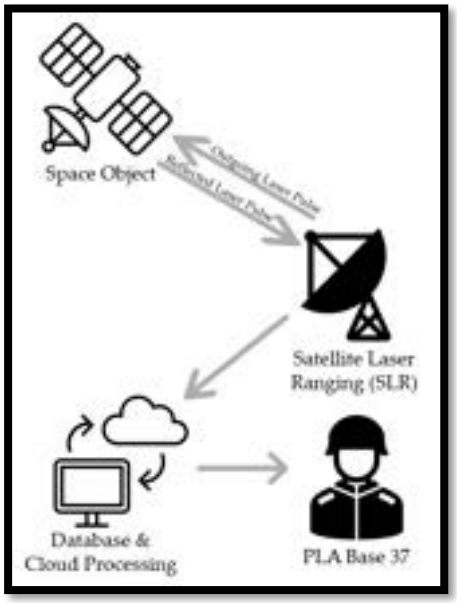
China is not the only country employing SDA; however, the PRC's approach to SDA is distinct from current Western models. For example, the United States uses ground stations throughout the world, operated by or with the cooperation of a range of partner nations and allies.[33] These ground stations monitor space from the Earth to maintain SDA. By contrast, China – with a very short history of any work with partner nations or allies – does not have access to a large number of ground stations outside of its own borders. For SDA, China is forced to rely on large numbers of satellites in LEO to overcome its limited global access to ground-based sensors.[34] China appears to be changing this method with an expansion or modernization of ground stations around the world—particularly in Latin America.

Figure 2: Overview of the PRC's SDA Process Using Radio Telescope



Radio telescopes emit radio waves that pinpoint a space object's location. The data gathered by the telescope is then transferred to a data and cloud processing center, where it is analyzed and delivered to PLA Base 37.

Figure 3: Overview of the PRC's SDA Process Using Satellite Laser Ranging



SLR is another method of SDA employed by the PLA to locate space objects. SLR sends out laser pulses that are reflected back to the SLR dish when the laser pulses hit a space object. The data gathered by the telescope is transferred to a data and cloud processing center, where it is analyzed and delivered to PLA Base 37.

Finding 2: Beijing Recognized the Importance of Latin America for Space Domain Awareness and Developed Plans to Target the Region for Expansion of Space Capabilities.

Latin America occupies a critical position in the PRC's Space Corridor due to the region's value for SDA capabilities. Outside its borders, China maintains limited access to ground-based space facilities.[35] This constrained access to space infrastructure significantly limits the PRC's ability to conduct globalized SDA, particularly for intelligence collection against adversaries such as the United States. Because ground stations can only communicate directly with a satellite when it is within "line-of-sight,"[36] having bases spread across different continents is essential for China to maintain constant, real-time control over its military and surveillance assets throughout the entirety of those assets' orbits around the Earth. If a satellite operator does not have use of a network of ground stations that can reach a satellite throughout its entire orbit, that operator would have to wait for the satellite to reach a part of its orbit in view of the ground station network (and hope that it does so without encountering issues) before being able to command that satellite again. Geometric realities mean that the closer to Earth a satellite's orbit is, the more ground stations are necessary to maintain continuous direct contact with that satellite. Even for a satellite in geostationary orbit, a very distant orbit, at least three ground stations evenly spaced across the globe longitudinally are required to maintain such continuous direct contact.

So, to maintain control and data transmission throughout its satellites' entire orbits, the PRC maintains access to space infrastructure in Latin America, allowing China to track satellites and other foreign objects that are otherwise beyond the line of sight of ground stations in mainland China. Such coverage provides the PLA with near-global surveillance capacity. None of this is by accident. China has decades-old policies detailing how important Latin America is to Beijing's ambition of achieving total space power status.

Figure 4: Geostationary Orbit Ground Station Coverage

Three stations located across Earth provide global coverage of outer space, allowing the continuous monitoring of space objects. The stations cause overlapping coverage zones to ensure there are no gaps when monitoring space objects.

The PRC's strategic engagement with Latin America has evolved from basic cooperation toward deeper long-term engagement with the region, as shown by the progression of its official policy white papers. The 2008 China-Latin America Policy White Paper established the initial framework for China's SDA buildout by designating aerospace as a priority area for coordination between high-levels of government

and scientific exchange.[37] Infrastructure development was framed primarily as a means to "improve conditions" for trade, supported by the construction of information and communications networks and the expansion of intelligence and military exchanges.[38] Analytically, this condition improvement served as the prerequisite for establishing the ground stations necessary to bridge China's monitoring gaps in Latin America.

While the 2008 China-Latin American Policy White Paper frames infrastructure development as a way to "improve conditions" in the region,[39] the PRC's approach in 2016 shifted toward integration of logistics, energy, and information technology.[40] This second iteration introduces the China-Latin America and Caribbean Community Forum, a permanent multilateral platform to drive the "goal of common development."[41] The document outlines the aims that Latin American infrastructure integrates Chinese technical standards and that Latin American and Chinese technological development cooperation expands in areas such as energy, manufacturing, and digital networks.[42] This is critical for SDA, as it ensures that regional telemetry and data-sharing systems remain interoperable with Chinese military and scientific networks.

The PRC's latest policy document on Latin America and the Caribbean, released in 2025, places further emphasis on Latin America as a key region for national security, characterizing Latin America as an "indispensable force" in countering what Beijing defines as "unilateral bullying."[43] To safeguard China's national security interests, the PRC has advanced the "high-quality co-construction" of the BRI, specifically prioritizing infrastructure through the deployment of smart cities, smart transportation, and digital networks.[44] For the first time, the 2025 document explicitly categorizes "space cooperation" as a primary pillar, inviting Latin American countries to participate in the navigation system provided by China's Beidou satellites, manned space missions, and the International Lunar Scientific Research Station.[45] This transition reflects a shift from a focus on technical exchange to a model of deep integration with China's extra-planetary ambitions. Parallel to these advancements, the PRC has elevated military and legal cooperation from basic exchanges – as outlined in its 2008 document – to a project defined by military-industrial technical cooperation and the adoption of Chinese Artificial Intelligence governance models.[46] This evolution underscores that SDA infrastructure is no longer just an asset to support scientific space exploration but a fundamental component of China's national security and global intelligence architecture.

The China-Latin America and Caribbean Community (CELAC) Forum, emphasized in both the 2008 and 2025 documents, serves as a platform for promoting cooperation between Latin America and China.[47] The most recent forum held in 2025 introduced the 4th China-Community of Latin American and Caribbean (CELAC) Member States Joint Action Plan, which outlines key areas for cooperation for 2025 to 2027, details an aim to bolster space collaboration and continue the China-Latin America Space Cooperation Forum.[48] This institutional

support provides the legal and diplomatic cover necessary for the long-term presence of Chinese-operated space facilities.

The 2024 China-Latin America Space Cooperation Forum was held in Wuhan, China, and introduced the Wuhan Declaration, an international cooperation agreement jointly issued by representatives of the China National Space Administration and space agencies of Latin American and Caribbean countries.[49] The Wuhan Declaration aimed to promote comprehensive cooperation in the space field.[50] The declaration outlined the need to prioritize the practical application of satellite communication, navigation, and remote sensing technologies in fields such as environmental protection, agriculture, and disaster mitigation, supported by a dedicated data-sharing platform and long-term talent cultivation programs.[51] The application of these dual-use technologies provides the justification for expanding the very ground-based sensors and high-speed data links the PLA needs for SDA. This specific intent to share data, combined with the structural integration of regional space agencies into China's lunar and Beidou missions, confirms that the expansion of ground infrastructure in Latin America is a calculated strategy to finalize China's global SDA capabilities.

Finding 3: The PRC Secured Access to an Extensive Network of Dual-Use Space Infrastructure Across Latin America.

Central to the PRC's capabilities for space operations and space support to Earth-based operations are its 11 space facilities throughout Latin America. The types of space facilities include ground stations, radio telescopes, and Satellite Laser Ranging (SLR) Stations. Ground stations conduct SDA by tracking thousands of satellites and other objects.[52] These stations form part of the backbone of China's ground-based remote sensing network, because they have the ability to reduce delays from relaying, expand reach, and enable live data flow. Radio telescopes are specialized antennas that detect radio waves from outer space and study a wide range of astronomical phenomena.[53] SLR stations provide high-precision geodetic data with millimeter-level accuracy, which is essential for improving the accuracy and reliability of long-range ballistic missile systems by refining the precise location and orientation of a launch site.[54] These space facilities throughout Latin America are ostensibly advertised as civilian scientific facilities; however, these stations are directly connected to the PLA.

Figure 5: PRC Ground-Based Space Infrastructure in Latin America

The image above depicts a map of China's Space Silk Road in Latin America.

This section provides a brief overview of each PRC-linked space facility in Latin America, including background on the facilities, the Chinese government and Chinese firms' involvement with the facility, and the dual-use infrastructure present within the facility. The accompanying recent satellite imagery is provided by Planet Labs.

Espacio Lejano Station

Bajada del Agrio, Neuquén Province, Argentina

Figure 6: Planet Labs PBC

Located in Argentina, the **Espacio Lejano Station** is a radio station operated by the Chinese National Space Administration in collaboration with Argentina's National Space Activities Commission.[55] The station, active since 2018, has an advertised intention of supporting interplanetary missions like the Chang'e probes and will aid future Mars research.[56] However, the PRC tested the station's Very Long Baseline Interferometry (VLBI), a technique to measure distances in space,[57] and found the data transmission capabilities insufficient for sending full real-time VLBI data back to Beijing.[58] So while the station cannot fully support its ostensible space exploration purpose at present, it is capable of supporting military applications. The 35-meter high-gain antenna on the station is able to operate in the S-, X-, and Ka-bands,[59] which are the necessary frequencies for VLBI.[60] High-gain antennas are also used for electronic intelligence (ELINT) and signal intelligence (SIGINT) because they can be used to intercept weak signals from foreign satellites or deep-space probes and can passively monitor downlink frequencies of other nations' assets to analyze patterns.[61] The site is also equipped with hydrogen maser atomic clocks for precise timing and synchronization, advanced telemetry systems, and real-time data processing facilities designed to support operations.[62] Furthermore, the base sits near the same longitude as the U.S. East Coast and at about the same distance from the

equator as Washington, D.C., in good line of sight to most geostationary satellites serving the eastern United States.[63]

The Espacio Lejano Station is operated and managed by the Xi'an Satellite Control Center, which operates under the China Satellite Launch and Tracking Control General (CLTC).[64] In 2015, Argentina and China signed an agreement providing China with a 50-year lease to the 200-hectare site, giving China the exclusive right to build and operate the station, tax-free.[65] To fund the development of the station, the Chinese government provided $54,536,079 to build the station and hired China Harbor Engineering Corporation as the general contractor responsible for construction of the site.[66]

In 2016, Argentine and Chinese officials signed an agreement stipulating that the station will be solely for civilian purposes; however, it appears that the two sides did not establish any oversight mechanisms.[67] Argentinian nationals are excluded from conducting inspections of the site, preventing independent verification that the facility is not being used for military purposes.[68] The site also serves as a part of the Chinese Deep Space Network, a network of large antennas and communication facilities used for radio astronomy radar observations, and spacecraft missions providing TT&C for deep space probes and satellites.[69] This network is speculated to be used to conduct real-time data relay for PLA reconnaissance satellites or anti-satellite (ASAT) weapons testing support.[70]

Felix Aguilar Astronomical Observatory

San Juan Province, Argentina

Figure 7: Planet Labs PBC

China's National Astronomical Observatories of China (NAOC) established the **Felix Aguilar Astronomical Observatory's Satellite Laser Ranging (SLR) project** in 2005 as the primary scientific partner.[71] This SLR system was designed and developed by the Chinese Academy of Surveying and Mapping and National Astronomical Observatories of the Chinese Academy of Sciences and funded by the Ministry of Science and Technology of China.[72] This project is the most active SLR site in Latin America, serving as a key part of China's global geodetic networks.[73] This project's 60cm laser telescope delivers high-precision orbit data that could be used for anti-satellite defense, dazzlers to blind enemy sensors, Space Situational Awareness, and reconnaissance, using adaptive optics to correct atmospheric distortion. [74] These capabilities can enable precise targeting, electronic warfare, and strategic warning against threats in air, sea, and space.

A new China-Argentia Radio Telescope (CART) project with 40m radio telescope operating on a 1–45 GHz with VLBI was announced in 2015. [75] The project was planned to support astronomical research,[76] however the telescope enables millimeter-level Earth orientation and geolocation data, fueling suspicion the PRC would use the project to advance its intelligence capabilities.[77] Due to these concerns, the CART project was shut down in 2025 after the Trump administration pressured Argentina to weaken ties with China.[78]

Río Gallegos Ground Station

Río Gallegos, Argentina

Figure 8: Planet Labs PBC

China's involvement in the **Río Gallegos Ground Station** is facilitated through a commercial partnership between the Argentine firm Ascentio Technologies and the Chinese company Emposat (Beijing Aerospace Yuxing Technology).[79] While authorized as a civilian facility by Argentina's National Entity of Communications in 2021, Emposat maintains deep ties to the PLA's Aerospace Force, with Emposat personnel traced to PLA Bases 25 and 26, the command hubs for China's satellite launches.[80]

The station is equipped with four to six X and C-band antennas that provide the secure communications necessary for modern electronic warfare.[81] A satellite dish was also installed;[82] however, no additional information regarding its specifications or function could be identified from publicly available sources.

El Sombrero Satellite Ground Station

Captain Manuel Rios Aerospace Base, Guárico, Venezuela

Figure 9: Planet Labs PBC

The **El Sombrero Satellite Ground Station**, formally known as the Baemari station, is a civilian base run by Venezuela's Bolivarian Agency for Space Activities and situated within the Capitán Manuel Ríos Air Base, a military hub serving as a maintenance base for Venezuela's Sukhoi Su-30MK2 fighter jets.[83] While the exact details of the technology are unclear, the station is equipped with antennas, equipment, and computer systems that allow the communication, tracking, and control of Venezuelan satellites.[84] After Venezuela joined China's International Lunar Research Station project in 2023, the PRC gained access to Venezuela's El Sombrero's control ground station infrastructure.[85] The station was also built by China Great Wall Industry Corporation.[86]

Luepa Satellite Control Ground Station

Luepa, Bolívar State, Venezuela

Figure 10: Planet Labs PBC

China operates **Luepa Satellite Control Ground Station**, which serves as a backup station for the above-discussed El Sombrero station.[87] While officially described as a center for exploring the moon and Mars, the facility is run by the China Great Wall Industry Corporation (CGWIC).[88] The station is used for TT&C, which involves commanding satellites, monitoring their systems' health, and calculating their orbits.[89]

La Guardia Ground Station
Santa Cruz, Bolivia

Figure 11: Planet Labs PBC

The **La Guardia Ground Station** serves as another dual-use node within China's expanding space infrastructure in Latin America. Built by the China Great Wall Industry Corporation and technical oversight from the China Satellite Launch & Tracking Control General, the facility is officially a backup site for the Túpac Katari (TKSAT-1) satellite.[90] The site was funded as a part of a $250 million loan from the PRC; the financial structure of the project creates a long-term presence for Beijing, ensuring Chinese technical personnel remain embedded at the site through at least 2028.[91] The site station is also operated by Bolivian engineers who received training from China.[92]

Equipped with 13-meter and 5-meter parabolic antennas, La Guardia provides TT&C capabilities that are inherently dual-use.[93] The station's antennas are capable of operating in Ku and C-band frequencies, civilian broadcasting, and environmental sensing offers significant military utility.[94] The site's Satellite Image Processing and Analysis Laboratory also allows for high-tech remote sensing analysis, which can be repurposed for military intelligence and terrain mapping.[95] Furthermore, the station's integration with the PLA-linked China Satellite Launch & Tracking Control General enables it to contribute to SDA, providing the PLA with the ability to monitor orbital trajectories of adversaries' satellites.

The station is built on a 900-square-meter plot and comprises a technical-administrative block, an electrical power block, and an antenna field, all of which

are used for TT&C as well as data processing. [96] The site is equipped with a 13-meter parabolic antenna dedicated to the primary control and monitoring of the TKSAT-1 satellite and a 5-meter antenna that provides a dedicated communication link with the Amachuma Ground Station.[97]

Amachuma Ground Station

Achocalla, La Paz, Bolivia

Figure 12: Planet Labs

The **Amachuma Ground Station** serves as the primary TT&C station for the TKSAT-1 (Túpac Katari) satellite.[98] The site was completed in 2013 by the China Great Wall Industry Corporation,[99] the facility features six large antennas including multiple 13-meter dishes capable of TT&C and other operations.[100] The six large parabolic antennas were constructed and assembled by both Chinese technical specialists and Bolivian professionals trained in China.[101] Three of the antennas measure at 13 meters in diameter and weigh an average of 40 tons. The remainder includes a fourth antenna measuring 9 meters, another measuring at 7.4 meters, and a smaller antenna with a height of 5 meters and a weight of 1 ton.[102] While ostensibly a sovereign Bolivian asset, the facility relies on Chinese-trained engineers to run the site.[103]

The facility's powerful transmit and receive capabilities, paired with its advanced image processing laboratory,[104] enable dual-use applications ranging from encrypted communications to transmitting – potentially for use in military targeting – high-resolution imagery from remote sensing satellites. This station can be a functional extension of the PLA's global kill chain, enabling Beijing to find and track targets across the Americas with minimal regional oversight. Concerningly, Iván Zambrana, the head of the Bolivian Space Agency, admitted the facility rents spare antenna time to Chinese entities to control the launch of their own satellites.[105] So in addition to the Chinese-trained engineers running the site, China's own satellite operations personnel maintains a regular operational presence,[106] allowing PRC-linked personnel to utilize the facility's high-performance hardware for their own missions.

Atacama Large Millimeter Array at Paranal Observatory
Atacama Desert, Chile

Figure 13: Planet Labs PBC

The **China-Chile Astronomical Data Center** in Santiago, Chile was established through a partnership between China Academy of Sciences, Huawei, and Chile's Federico Santa María Technical University.[107] The facility leverages Huawei's high-performance computing and artificial intelligence to process the massive datasets generated by the Atacama Large Millimeter Array within the site.[108] While its primary mission is mapping galaxies, the underlying supercomputing power can also be turned to military applications. The same algorithms required to filter noise from deep-space signals can be repurposed for military signals intelligence and the exploitation of sensitive data intercepted from transmissions to and from facilities operated in Latin America.

China's footprint in the Atacama Desert is further cemented by the Ventarrones Astronomical Park and its Transient Objects Monitoring project.[109] Although framed as a civilian search for asteroids,[110] the high-precision tracking technology required to monitor high-speed orbital objects is identical to that needed for satellite targeting. Concerns are compounded by the involvement of personnel like Jing Liu, a chief scientist with documented links to PLA Unit 93147—a wing of the Chinese military specializing in satellite engineering and radar imaging.[111] By embedding military-linked researchers into a civilian science park just miles from U.S. and European space facilities in Chile, Beijing has created a persistent intelligence foothold.

After Brandon Judd, the U.S. ambassador to Chile, raised concerns regarding China's plans to build the data center, the Chilean government subsequently

suspended the project.[112] In 2025, the Chilean government announced the cancellation of the project due to security concerns associated with China's presence.[113]

Santiago Satellite Station

North of Santiago, Chile

Figure 14: Planet Labs PBC

The **Santiago Satellite Station in the Chilean Andes** initially served as a collaborative site for research on space technology between the Swedish Space Corporation and China Satellite Launch and Tracking Control.[114] However, in 2020, the Swedish Space Corporation allowed its contracts with China Satellite Launch and Tracking Control to lapse[115] after the Swedish Defense Research Agency discovered that China had antenna access at a ground station in Sweden that could be used for military intelligence gathering and surveillance and such access may have violated the Chinese entity's terms of use at that facility.[116]

The Santiago Satellite Station's infrastructure includes a four-row linear array designed to track objects moving through space at high speeds, alongside a fenced-off Yagi antenna complex.[117] While these tools are officially used for communicating with scientific satellites, they are also capable of gathering intelligence by intercepting signals from foreign satellites, allowing the PLA to monitor these satellites' exact movements. By mapping the precise locations of other countries' space assets, the Chinese military could potentially use that data to target or disable them during a conflict.

Tucano Ground Station

Tucano, Brazil

Formally established through a 2020 agreement, the Tucano Ground Station is a joint venture between the Brazilian startup Ayla Nanosatellites and Chinese company Beijing Tianlian Space Technology.[118] Aside from the general area, the exact location of Tucano Ground station is unknown.[119] Beijing Tianlian Space Technology, affiliated with both the China Academy of Space Technology and the China Aerospace Science and Technology Corporation, will provide long-duration, high-coverage space-to-ground voice and data communications for human spaceflight and reconnaissance satellites.[120] Ayla Nanosatellites, for its part, has stated that the ground station will support its commercial Alya-1 constellation for Earth observation.[121]

Alya Nanosatellites executed a Memorandum of Understanding (MOU) with Beijing Tianlian Space Technology agreeing to store and exchange operational data between their respective facilities through their antenna networks.[122] This will allow both parties to expand coverage for both polar and equatorial orbits, supporting LEO and GEO satellites and broadening service access for users.[123] An arrangement involving the storage and exchange of operational data through interconnected antenna networks could, in practice, enhance tracking precision, SSA, and command resilience across both civil and defense space assets.

The military implications are reinforced by the project's formal ties to the Brazilian defense establishment. Alya Nanosatellites also entered a MOU with the Brazilian Air Force's Technological and Science Department, which includes training military personnel in orbit simulation and utilizing Air Force antennas as a backup for the Tucano site.[124] This integration provides the PRC with a conduit to observe and influence Brazilian military space doctrine while establishing a permanent footprint in a region vital to U.S. national security. By synthesizing hyperspectral data from the Alya constellation with their own information network,[125] the PRC could develop a high-revisit surveillance capability that can identify camouflaged military assets and track foreign space objects in real-time.

China-Brazil Joint Laboratory for Radio Astronomy Technology

Serra do Urubu, Brazil

The **China-Brazil Radio Astronomy Technology Joint Laboratory** was established in 2025 after China Electric Science and Technology Network Communication Research Institute (CESTNCRI) signed an agreement with the Federal University of Campina Grande in Brazil and the Federal University of Paraíba.[126] The agreement formalizes bilateral collaboration in advanced radio astronomy research, deep space observation technologies, and large-scale scientific project planning.

The laboratory will focus on cutting-edge technology development to support astronomical observation and deep space exploration.[127] Its mandate includes coordinating international exploration and international scientific cooperation, planning major research initiatives, and translating scientific innovation into broader technological applications.[128] Notably, because CESTNCRI is deeply integrated into China's defense-industrial base, the broader technological applications of these deep space observation systems could have dual-use capabilities for military intelligence, SSA, and tracking non-cooperative targets.

The laboratory builds upon the Bayron Acoustic Oscillation in Neutral Gas Observations (BINGO) project, a multinational radio astronomy initiative designed to detect baryon acoustic oscillations (BAOs) through radio frequency observation.[129] BINGO is a collaborative effort involving research institutions from Brazil, China, South Africa, the United Kingdom, Switzerland, and France.[130] The telescope is currently under construction in São Paulo and, once completed, will be transported to Serra do Urubu, near Aguiar city in Brazil.[131]

The technical specifications of the BINGO Telescope consist of two parabolic reflectors, 50 horns, receivers, and a Fast Fourier Transform (FFT) analyzer.[132] The telescope is designed to survey a 15° by 200° sky region over several years,[133] enabling a broad survey area for precision cosmology. The BINGO Telescope's scientific mission is characterized as detecting neutral gas like atomic hydrogen through a wavelength located at a redshift between 0.13 and 0.48.[134] To achieve this, the telescope must aggressively filter out man-made Radio Frequency Interference (RFI).[135] The system's FFT analyzer acts as a digital spectrometer that digitizes and categorizes these signals. While astronomers view these signals as "trash"[136] to be subtracted to see the early universe, the high-performance algorithms used in the system could be capable of intercepting, classifying, and isolating military radar pulses, satellite telemetry, and electronic warfare activity with extreme sensitivity.

Finding 4: Beijing Uses Space Infrastructure in Latin America to Collect Adversary Intelligence and Strengthen the PLA's Future Warfighting Capabilities.

The proliferation of Chinese space infrastructure across Latin America illustrates how civilian-run sites can be dual-use military facilities, extending the PLA's ability to target and disrupt adversary space systems across the globe. These facilities, equipped with high-gain parabolic antennas, advanced optical telescopes, radars, and other sensor support various missions including intelligence collection, counterspace targeting, ballistic missile early warning, spaceflight safety, satellite anomaly resolution, and space debris monitoring.[137] These capabilities provide the technical foundation for SDA and electromagnetic warfare capabilities important for future conflict.

These technologies can be used in a civilian capacity or a military capacity, which poses a direct threat to U.S. and allied security. Ground stations capable of TT&C can also support long-range missile operations, including intercontinental ballistic missiles and hypersonic glide vehicles, by providing precise tracking data and mid-course guidance updates.[138] In conflict, this reduces uncertainty in weapons performance and increases the accuracy and survivability of PRC missiles. Due to their location and ability to communicate with satellites overhead in the Western Hemisphere, these ground stations particularly enable more successful strikes on the United States. This would be a particular advantage to PLA efforts to disrupt U.S. military mobilization in response to a PRC-initiated crisis in the western Pacific Ocean.

The PRC also likely collects intelligence on nations in the Americas from radio frequency signals between multiple satellites and ground stations. The PRC's space facilities in Latin America send and receive in the same radio frequency bands, such as S-band, X-band, and Ka-band, as most U.S. military communications and navigation systems.[139] By operating ground stations in Latin America equipped with very large antennas designed for use in these radio frequencies, China can more closely monitor U.S. transmissions.[140]

These geographically dispersed, large footprint data collection points also enable situational awareness of operations on Earth. Because naval vessels and military aircraft transmit data that reach different nodes at slightly different intervals and frequencies, the PLA could pinpoint the exact location of these moving objects by calculating the Time Difference of Arrival and the Frequency Difference of Arrival.[141] Ground stations in Latin America function as both downlink and uplink points for this data, facilitating the real-time tracking of carrier strike groups in the Atlantic and Pacific Oceans.

For assets located in high-Earth orbit or deep space, the PRC employs VLBI, as noted above. VLBI coordinates observations between various telescopes, such as the telescope in San Juan, Argentina and another 40-meter telescope in Kunming, China,[142] to create a massive, virtual telescope with a diameter

equivalent to the physical distance between the two sites.[143] This achieves a level of granularity allowing for millimeter-level positioning accuracy. Such precision is not merely for observation; it provides the necessary tracking data to target adversary military or civilian assets in space, including by the jamming of communications or the physical interception of satellites.

The continuity of this surveillance is maintained by the Yuanwang maritime fleet, which operates as a mobile extension of the terrestrial network. [144] These vessels deploy globally, including along the coast of Latin America, to fill geographic blind spots, ensuring that U.S. and other adversary assets remain under constant observation even when they pass out of the line of sight of fixed ground stations. In coordination with the Tianlian relay satellite constellation, these mobile platforms transmit telemetry and other data back to central processing hubs like the Xi'an Satellite Control Center. [145] This integrated architecture ensures that the PLA maintains a real-time, global picture of the operational environment.

Information collected from China's space ecosystem becomes processed data which closes the PLA's kill chain.[146] The telemetry gathered from these overseas nodes could provide the terminal guidance necessary for advanced weaponry, such as intercontinental ballistic missiles and hypersonic glide vehicles.[147] By monitoring complex maneuvers and atmospheric re-entry phases from Latin America, the PLA's network of space infrastructure ensures that weapons can be steered toward their targets. This network allows the PLA to find and track their chosen adversaries' activities even on China's far side of the globe, expanding its surveillance network and strike capabilities.[148]

Recommendations

As the PRC's space activities expand, the United States and its partners face a shared responsibility to ensure that space cooperation is conducted in a manner that is transparent, lawful, and consistent with mutual security interests. The expansion of Beijing's space infrastructure abroad—including through facilities hosted by third countries particularly in Latin America—raises important questions for host nations and their partners regarding sovereignty, data security, and long-term strategic alignment. The United States should address these issues through dialogue and cooperation with allies and partners, particularly in the Western Hemisphere. The following recommendations outline steps to strengthen collaboration, uphold existing legal frameworks, and ensure that international space partnerships advance shared national security, scientific, and economic objectives.

Policy Recommendation 1: NASA Should Review Cooperation with Host Countries.

NASA should examine any cooperation with nations hosting China's space infrastructure to ensure there are and have been no violations of the Wolf Amendment's prohibition on bilateral cooperation with China and Chinese-owned companies. This should include an examination of any multilateral space cooperation with these countries that involves China and should focus on whether any such multilateral cooperation is de facto bilateral with China. NASA should also examine the relative contribution of the host countries to determine if the cooperation from the other country substantively contributes to China's advancement in the space sector.

Policy Recommendation 2: Congress Should Update the Wolf Amendment

Congress should consider updating the Wolf Amendment to close a growing loophole that allows prohibited bilateral cooperation with the PRC to continue under the guise of nominally multilateral arrangements. Specifically, Congress should clarify that the inclusion of a third country does not exempt an activity from the Wolf Amendment's prohibition unless that country provides a substantive contribution—defined as a contribution that is necessary to the technical execution, operational viability, or scientific value of the activity, and without which the activity could not proceed in materially the same form. Congress should further direct that arrangements structured or modified primarily to avoid the application of the Wolf Amendment by recharacterizing bilateral cooperation as multilateral be treated as bilateral for compliance and enforcement purposes, with the burden on the implementing agency to demonstrate that any third-country participation is genuinely substantive.

Policy Recommendation 3: Condition U.S. Space, Defense, and Technology Cooperation on Risk Mitigation Measures

U.S. agencies should re-evaluate space, defense, and advanced technology cooperation with countries that host PRC-linked space infrastructure, with a focus on mitigating risks to U.S. systems, data, and personnel. Where appropriate, cooperation should be conditioned on host nations adopting safeguards such as limiting PRC operational control, reducing exclusive access agreements, and ensuring that sensitive U.S. or allied information – including civilian or commercial information and information relating to export-controlled technology – cannot be collected, transmitted, or exploited through PRC-operated facilities.

Policy Recommendation 4: Bolster Efforts to Eliminate Threatening PRC Space Infrastructure from the Western Hemisphere While Engaging Host Nations

The U.S. Government should establish the explicit goal of halting the expansion of PRC space infrastructure in Latin America, and ultimately seek to roll back and eliminate PRC space capabilities in the Western Hemisphere that threaten U.S. interests. The Trump Corollary to the Monroe Doctrine as articulated in the 2025 National Security Strategy (NSS) established a U.S. policy

to "deny non-Hemispheric competitors the ability to position forces or other threatening capabilities, or to own or control strategically vital assets, in our Hemisphere." PRC space infrastructure that aids PLA efforts to hold U.S. forces at risk, enables PRC espionage, and undermines U.S. strategic security clearly threatens American interests. As the National Security Council conducts its review of the Hemisphere's strategic geography as described in the NSS, it should assess and provide guidance to the interagency regarding PRC space infrastructure.

At the same time, the U.S. government should work with partner nations—particularly in Latin America—to encourage transparency, inspection rights, and legal oversight of foreign-operated space facilities on their territory. U.S. diplomatic engagement should emphasize that dual-use space infrastructure can carry sovereignty, intelligence, and long-term security risks, and that host nations retain both the right and responsibility to verify that facilities advertised as civilian are not being used for military or intelligence purposes inconsistent with their national laws or international commitments. The U.S. Intelligence Community should engage in appropriate "intel diplomacy" to provide as much information as practicable to the host countries.

Policy Recommendation 5: Expand Allied Opportunities for Civilian Space Cooperation with the U.S.

To reduce countries' reliance on PRC-provided space capabilities, the United States should expand civilian, transparent, and high-standard alternatives for space cooperation in the Western Hemisphere. This includes offering competitive partnerships in satellite services, data sharing, disaster response, scientific research, and workforce development through NASA, allied space agencies, and multilateral institutions. The U.S. government should encourage U.S. industry to provide host nations with viable alternatives that support development without creating long-term strategic or security dependencies on the PRC.

---

[1] PLA Daily [解放军报], *Soaring High in the New Century: Answering Questions from Our Reporter Xu Qiliang, Member of the Central Military Commission and Commander of the Air Force [奋飞在新世纪的天空——中央军委委员、空军司令员许其亮答本报记者问 本报记者]*, Sina Military [新浪军事] (Nov. 2, 2009), available at https://web.archive.org/web/20220307215249/https://mil.news.sina.com.cn/2009-11-02/0625572165.html.

[2] NASA, *State-of-the-Art of Small Spacecraft Technology* (Feb. 5, 2025), available at https://www.nasa.gov/smallsat-institute/sst-soa/soa-communications/.

[3] Defense Intelligence Agency, 2022 Challenges to Security in Space (Mar. 2022) at 4, available at https://www.dia.mil/Portals/110/Documents/News/Military_Power_Publications/Challenges_Security_Space_2022.pdf (Challenges in Space).

[4] U.S.-China Economic and Security Review Commission, *2025 Report to Congress of the U.S.-China Economic and Security Review Commission* (Nov. 2025) at 18, available at https://www.uscc.gov/sites/default/files/2025-11/2025_Annual_Report_to_Congress.pdf (2025 USCC Report).

[5] 2025 USCC Report at 387.

[6] Li Min [李敏], *Li Min Interview with South China Morning Post on China-Latin America Cooperation [李敏接受南华早报采访谈中拉合作]*, Institute of International Relations, SASS [上海社会科学院国际问题研究] (Apr. 20, 2025), available at https://iir.sass.org.cn/2025/0421/c443a577588/page.htm.

[7] Rob Miltersen, *Chinese Aerospace Along the Belt and Road*, China Aerospace Studies Institute (Jun. 2020), available at https://www.airuniversity.af.edu/Portals/10/CASI/documents/Research/Infrastructure/2020-06-10%20Chinese%20Aerospace%20Along%20the%20Belt%20and%20Road.pdf.

[8] China National Space Administration [中国航天**局**], *Building a Spatial Information Corridor to Support the Belt and Road Initiative [共建空间信息走廊 助力"一带一路"倡议]* (May 12, 2017), available at https://web.archive.org/web/20251111141503/https://www.cnsa.gov.cn/n6758823/n6758838/c6796639/content.html.

[9] National Development and Reform Commission, *14th Five-Year Plan for Special Digital Economy Development ["十四五"数字经济发展规划]* (archived Feb. 17, 2026), available at https://web.archive.org/web/20260217202236/https://www.ndrc.gov.cn/fggz/fzzlgh/gjfzgh/202112/t20211224_1309484_ext.html.

[10] Jonathan P. Roll & Oliver J. Du Bois, *Redshift: The Acceleration of China's Commercial and Civil Space Enterprise & The Challenge to America, Commercial Space Federation* (Sept. 2025) (Redshift) at 9, available at https://commercialspace.org/wp-content/uploads/2025/09/CSF-Redshift-v6.pdf.

[11] Redshift at 40.

[12] Meia Nouwens, *China's Dual-Use Space Sector Goes Global*, Int'l Inst. for Strategic Stud. (July 17, 2025), available at https://www.iiss.org/online-analysis/charting-china/2025/07/chinas-dual-use-space-sector-goes-global/.

[13] General Office of the State Council [国务院办公], *Opinions on Promoting the Deepening of Military-Civilian Integration in the National Defense Science and Technology Industry [关于推动国防科技工业军民融合深度发展的意见]* (Nov. 11, 2023), available at https://web.archive.org/web/20230328063622/https://www.gov.cn/gongbao/content/2017/content_5248218.htm.

[14] Yu-Ping Chang, *National Defense Mobilization: Toward A Clear Division of Labor between the PLA and Civilian Bureaucracies*, Jamestown Found. (Mar. 15, 2024), available at https://jamestown.org/national-defense-mobilization-toward-a-clear-division-of-labor-between-the-pla-and-civilian-bureaucracies/.

[15] U.S.-China Economic and Security Review Commission, *Chapter 7: The Final Frontier: China's Ambitions to Dominate Space* (last accessed Feb. 2) at 387, available at https://www.uscc.gov/sites/default/files/2025-11/Chapter_7--The_Final_Frontier_Chinas_Ambitions_to_Dominate_Space.pdf.

[16] China National Space Administration [国家航天局], *White Paper on China's Space Activities in 2016 [《2016 中国的航天》白皮书]* (Dec. 27, 2016), available at https://web.archive.org/web/20200808195926/https://www.cnsa.gov.cn/n6758824/n6758845/c6772477/content.html.

[17] Central People's Government of the People's Republic of China [中华人民共和国中央人民政府], *China's Space Program in 2021 [2021 中国的航天]* (Jan. 28, 2022), available at https://archive.ph/SqTsd.

[18] Id.

[19] The State Council Information Office of the People's Republic of China [中华人民共和国国务院新闻办公室, *China's Military Strategy White Paper (Full Text) [中国的军事战略》白皮书（全文）]* (May 26, 2015), available at https://archive.ph/vyLge.

[20] Id.

[21] Chinese military texts often do not provide labels for concepts, and instead, use functional descriptions. This report's use of SDA comes from the China Aerospace Studies Institute's identification that space will become central to "anti-reconnaissance, surveillance and anti-surveillance, as well as ensuring early warning, communication, navigation and battlefield perception, command decision-making, precision strikes and strike effect evaluation." This description most closely correlates with the U.S. military's doctrinal term of SDA. *See* China Aerospace Studies Institute, *In Their Own Words: Science of Military Strategy*, (2020) at 142-148 *available at* https://www.airuniversity.af.edu/Portals/10/CASI/documents/Translations/2022-01-26%202020%20Science%20of%20Military%20Strategy.pdf.

[22] United States Space Force, Space Doctrine Note Operations Doctrine for Space Forces, (January 2022) at 21, available at https://media.defense.gov/2022/Feb/02/2002931717/-1/-1/0/SDN%200PERATI0NS%2025%20JANUARY%202022.PDF.
[23] Challenges in Space at 16.
[24] Challenges in Space at 16.
[25] Challenges in Space at 16-17.
[26] Kristin Burke, *The PLA's New Base for Space Situational Awareness: Opportunities and Challenges for the U.S.*, China Aerospace Studies Institute (Sept. 2023) at 2, available at https://www.airuniversity.af.edu/Portals/10/CASI/documents/Research/PLASSF/2023-09-11%20The%20PLA's%20New%20Base%20for%20SSA.pdf (PLA's New Base for SSA).
[27] *Id.*
[28] State Council Information Office of the State Council, *China's Military Strategy (Full Text)*, (May 27, 2015) available at https://web.archive.org/web/20200603154926/https://english.www.gov.cn/archive/white_paper/2015/05/27/content_281475115610833.htm.
[29] Academy of Military Science, *The Science of Military Strategy [战略学]* (6th Class Dragon Science Publishing House, 2013), available at https://nuke.fas.org/guide/china/sms-2013.pdf.
[30] Kristen Burke, *China's Different Approach to Space Situational Awareness, China Aerospace Studies Institute* (Dec., 2024) at 2, available at https://www.airuniversity.af.edu/Portals/10/CASI/documents/Research/Space/2024-12-02%20China's%20Different%20Approach%20to%20Space%20Situational%20Awareness.pdf (China's Different Approach).
[31] China Military Online [中国军网], Providing an "Information Umbrella" for Modern Warfare [为现代战争撑起"信息伞"] (May 13, 2021), available at https://web.archive.org/web/20260123151902/http://www.81.cn/jfjbmap/content/2021-05/13/content_289225.htm.
[32] *Id.*
[33] China's Different Approach at 2.
[34] Redshift at 60.
[35] China's Different Approach at 21.
[36] National Aeronautics and Space Administration, *11.0 Ground Data Systems and Mission Operations* (Feb. 5, 2025), available at https://www.nasa.gov/smallsat-institute/sst-soa/ground-data-systems-and-mission-operations/.
[37] Ministry of Foreign Affairs of the People's Republic of China [中华人民共和国外交部], *China Policy Paper on Latin America and the Caribbean [中国对拉丁美洲和加勒比政策文件]* (Nov. 5, 2008) available at https://archive.ph/XcKPW.
[38] *Id.*
[39] *Id.*
[40] Xinhua Beijing [新华北京], *China's Policy Paper on Latin America and the Caribbean (Full Text) [中国对拉美和加勒比政策文件（全文)]*, Xinhua [新华] (Nov. 24, 2016), available at https://web.archive.org/web/20240419215600/http://www.xinhuanet.com//world/2016-11/24/c_1119980472.htm.
[41] *Id.*
[42] *Id.*
[43] Central People's Government of the People's Republic of China [中华人民共和中央人民政府], *China's Policy Document on Latin America and the Caribbean (Full Text) [中国对拉丁美洲和加勒比政策文件（全文)]* (Dec. 10, 2025), *available at* https://web.archive.org/web/20251211131911/https://www.gov.cn/yaowen/liebiao/202512/content_7050812.htm.
[44] *Id.*
[45] *Id.*
[46] *Id.*
[47] China-CELAC Forum [中国-拉共体论坛], *Forum Introduction* [论坛简介] (Mar. 1, 2018), *available at* https://web.archive.org/web/20251106232219/http://www.chinacelacforum.org/ltjj/201803/t20180301_6284968.htm.
[48] Central People's Government of the People's Republic of China [中华人民共和中央人民政府], *China-CELAC Member States Joint Action Plan on Cooperation in Key Areas (2025 – 2027) [中国－拉共体成员国*

重点领域合作共同行动计划(2025 - 2027] (May 14, 2025), available at https://web.archive.org/web/20250707184018/https://www.gov.cn/yaowen/liebiao/202505/content_7023660.htm.

[49] China National Space Administration., *2024 China-Latin American and Caribbean States Space Cooperation Forum Wuhan Declaration——Space promotes the building a community of shared future fo* (May 25, 2024), available at https://web.archive.org/web/20240918174326/https://www.cnsa.gov.cn/english/n6465652/n6465653/c10514240/content.html.

[50] *Id*.

[51] *Id*.

[52] Matthew P. Funaiole, Brian Hart, & Aidan Powers-Riggs, *Hidden Reach: China's Ground Stations and the Space Race*, Ctr. for Strategic and Int'l Stud. (2025), available at https://features.csis.org/hiddenreach/china-ground-stations-space/.

[53] National Aeronautics and Space Administration, *Radio Astronomy* (last accessed Feb. 3, 2026), available at https://www.mdscc.nasa.gov/index.php/en/radio-astronomy/.

[54] NASA Earth Data, Satellite Laser Ranging (SLR) (last visited on Feb. 2, 2026), available at https://www.earthdata.nasa.gov/data/space-geodesy-techniques/slr.

[55] *Centers and Stations [Centros y Estaciones],* Argentina.gob.ar (last visited on November 23, 3035), available at https://www.argentina.gob.ar/ciencia/conae/centros-y-estaciones/estacion-cltc-conae-neuquen.

[56] Matthew P. Funaiole et al., *Eyes on the Skies: China's Growing Space Footprint in South America*, Center for Strategic International Studies (Oct. 4, 2022), available at https://features.csis.org/hiddenreach/china-ground-stations-space/; and Samantha Lu et al., *CCP Inc. in Argentina: China's International Space Industry Engagement*, Center for Strategic International Studies at 13 (January 2023), available at https://csis-website-prod.s3.amazonaws.com/s3fs-public/2023-01/230124_Lu_CCPInc_Argentina.pdf.

[57] NASA Earth Data, *Very Long Baseline Interferometry (VLBI)* (last visited on Jan. 7, 2026), available at https://www.earthdata.nasa.gov/data/space-geodesy-techniques/vlbi.

[58]Kristen Burke, *China's Space Situational Awareness Capacity for Beyond GEO*, China Aerospace Studies Institute (Sept., 2022) at 4, available at https://www.airuniversity.af.edu/Portals/10/CASI/documents/Research/CASI%20Articles/2022-09-12%20China%27s%20Space%20Situational%20Awareness%20Capacity%20For%20Beyond%20GEO.pdf.

[59] Cassandra Garrison, *China's Space Station in Argentina: A Black Box in Patagonia*, Reuters (Jan. 31, 2019), available at https://www.reuters.com/graphics/SPACE-ARGENTINA-CHINA/010090CP0J4/.

[60] National Aeronautics and Space Administration, *211 Wideband Very-Lang Baseline Interferometry* (2022) at 5-15, available at https://deepspace.jpl.nasa.gov/dsndocs/810-005/211/211E.pdf.

[61] National Reconnaissance Office, *The SIGINT Satellite Story* (last accessed Feb 2, 2026), available at https://www.nro.gov/foia-home/foia-sigint-satellite-story/#.

[62] Luis O. Noguerol and Verioska Velasco, *The Enigma of China's Strategic Base in Argentina*, Miami Strategic Intelligence Institute (2024), available at https://miastrategicintel.com/the-enigma-of-chinas-strategic-base-in-argentina/.

[63] Victor Robert Lee, *China Builds Space Monitoring Base in the Americas*, The Diplomat (May 24, 2016), available at https://thediplomat.com/2016/05/china-builds-space-monitoring-base-in-the-americas/.

[64] Li Guoli and Lu Binghong [李国利和吕炳宏], China's First Overseas Deep Space Monitoring and Control Station Provides Measurement and Control Support for "Heavenly Question" Fire Detection [我国首个海外深空测控站为"天问"探火提供测控支持], Ministry of National Defense of the People's Republic of China [中华人民共和国国防部](Jul., 24, 2020) available at https://web.archive.org/web/20241220070803/http://www.mod.gov.cn/gfbw/qwfb/yw_214049/4868621.html.

[65] Argentina and China, *Cooperation Agreement Between the Government of the Argentine Republic and the Government of the People's Republic of China on the Construction, Establishment and Operation of a Deep Space Station of China in the Province of Neuquén, Argentina, within the Framework of the Chinese Moon Exploration Program*, (signed April 23, 2014, entered into force June 4, 2015), United Nations Treaty Series, vol. 3182, No. 54412 available at https://treaties.un.org/doc/Publication/UNTS/Volume%203182/Part/volume-3182-I-54412.pdf (Cooperation Agreement Between).

[66] AidData, Chinese Government provides $50 million for construction of space station in Neuquén Province (last visited on January 6, 2026), available at https://china.aiddata.org/projects/52875/.
[67] Official Gazette of the Argentine Republic [Boletín Oficial de la República Argentina], Legislation and Official Notices [Legislación y Avisos Oficiales] (Nov. 28, 2018), available at https://www.boletinoficial.gob.ar/detalleAviso/primera/196796/20181128.
[68] Cooperation Agreement Between at 3-4.
[69] Matthew P. Funaiole et al., Eyes on the Skies: China's Growing Space Footprint in South America, Center for Strategic and International Studies (Oct. 4, 2022) available at https://features.csis.org/hiddenreach/china-ground-stations-space/.
[70] Julieta Pelcastre, China's Ground Stations in South America Raise Concerns, Diálogo Americas (Nov. 21, 2022), available at https://dialogo-americas.com/articles/chinas-ground-stations-in-south-america-raise-concerns/.
[71] National Astronomical Observatories of China, CART and SLR at South America Observing Station in Argentina (last visited on Jan. 21, 2026), available at https://archive.ph/wXVR4.
[72] T. Wang et al., New SLR Station Running in San Juan of Argentina, National Aeronautics and Space Administration (2006), available at https://ilrs.gsfc.nasa.gov/lw15/docs/papers/New%20SLR%20Station%20Running%20in%20San%20Juan%20of%20Argentina.pdf.
[73] Supra at note 72.
[74] H. Zhang, et al., Developments of space debris laser ranging technology including the applications of picosecond lasers, Applied Sciences, *11*(21), 10080 (2021), available at https://www.mdpi.com/2076-3417/11/21/10080; Iain Boyd, *Russia is Reportedly Building a Satellite-Blinding Laser — An Expert Explains the Tech*, Astronomy (Aug. 1, 2022), available at https://www.astronomy.com/space-exploration/russia-is-reportedly-building-a-satellite-blinding-laser-an-expert-explains-the-tech/
[75] National Astronomical Observatories Chinese Academy of Sciences, The China Argentina Observational Station (NAOC) (Jan. 19, 2021), available at https://english.nao.cas.cn/research/researchdivisions/radioastronomy/202103/t20210321_265672.html.
[76] CART, *Proyecto* (last accessed Jan 3, 2026), available at https://cart.unsj.edu.ar/proyecto.php.
[77] R. Evan Ellis, *China-Argentina Space Engagement: Reconciling Science, Sovereignty, and Strategic Risk*, Dialogo Americas (Jun. 12, 2024), available at https://dialogo-americas.com/articles/china-argentina-space-engagement-reconciling-science-sovereignty-and-strategic-risk/.
[78] Buenos Aires Times, Milei Halts Decade-Long Chinese Radio-Telescope Project in Argentina's West (Apr. 11, 2025), available at *https://www.batimes.com.ar/news/argentina/government-halts-chinese-space-radar-project-in-argentina.phtml*.
[79] Samantha Lu et al., *CCP Inc. in Argentina: China's International Space Industry Engagement*, Center for Strategic International Studies at 13 (January 2023), available at https://csis-website-prod.s3.amazonaws.com/s3fs-public/2023-01/230124_Lu_CCPInc_Argentina.pdf.
[80] 3GIMBALS, *The Strategic Role of Neuquén in China's Precision Strike Capabilities* (jun. 25, 2024) available at https://3gimbals.com/insights/the-strategic-role-of-neuquen-in-chinas-precision-strike-capabilities/.
[81] *Id*.
[82] ANI, Chinese Space Contractor to Install New Satellite Ground Station in Southern Argentina: Report (May 29, 2021), available at https://www.aninews.in/news/world/asia/chinese-space-contractor-to-install-new-satellite-ground-station-in-southern-argentina-report20210529070732/.
[83] RNV, Venezuela inaugurates first GLONASS station and consolidates technological sovereignty (2025), available at https://rnv.gob.ve/venezuela-inaugurates-first-glonass-station-and-consolidates-technological-sovereignty/.
[84] Maria Zuppello, *China's Rapid Expansion in Latin America Targets Space*, Dialogo Americas (Apr. 18, 2025), available at https://dialogo-americas.com/articles/chinas-rapid-expansion-in-latin-america-targets-space/.
[85] Agencia Bolivariana para Actividades Espaciales, International Lunar Research Station Project (Jul. 17, 2023), available at https://abae.gob.ve/venezuela-proyecto-lunar-internacional/.
[86] China Great Wall Industry Corporation, *In-Orbit Delivery* (last visited on Jan. 21, 2026), available at https://www.cgwic.com/CommunicationsSatellite/project.html.

[87] R. Evan Ellis, China-Latin America Space Cooperation: An Overview, The Diplomat (Feb. 16, 2024), available at https://thediplomat.com/2024/02/china-latin-america-space-cooperation-an-overview/.

[88] Ling Xin, *China's Sensitive Technology at Risk After Trump Abducts Venezuelan Leader Maduro*, South China Morning Post (Jan. 6, 2026), available at https://www.scmp.com/news/china/science/article/3338844/chinas-sensitive-technology-risk-after-trump-abducts-venezuela-leader-maduro.

[89] Joseph Federici et al., *China-Venezuela Fact Sheet: A Short Primer on the Relationship*, U.S.-China Economic and Security Review Commission (Jan. 13, 2026), available at https://www.uscc.gov/sites/default/files/2026-01/China_Venezuela_Fact_Sheet_A_Short_Primer_0.pdf.

[90] Agencia Boliviana Espacial, *Informacion De TKSAT-1* (last accessed on Feb 3, 2026), available at https://www.abe.bo/actividades/telecomunicaciones/.

[91] R. Evan Ellis, *Cooperación espacial China-América Latina – Actualización,* Dialogo Americas (Feb. 21, 2024), available at https://dialogo-americas.com/es/articles/cooperacion-espacial-china-america-latina-actualizacion/.

[92] Samuel Dumesh, *China's Footprint in Bolivian Space*, American Security Project (Jul. 14, 2025), available at https://www.americansecurityproject.org/national-security-and-space/chinas-space-infrastructure-diplomacy/chinas-footprint-in-bolivian-space/.

[93] Agencia Boliviana Espacial, *Bolivian government strategic plan (ABE 2021-2025)* (2022) at 10, available at https://www.abe.bo/files/planificacion/PEE_ABE_2021_2025.pdf (ABE Strategic Plan).

[94] AidData, *China provides technical support for installation of new capabilities at La Guardia Ground Station (Linked to Record ID#35922)* (last visited Feb. 2, 2026), available at https://china.aiddata.org/projects/70272/.

[95] Agencia Boliviana Espacial, *Earth Observation* (last visited on Feb. 2, 2026), available at https://www.abe.bo/lpais/.

[96] Bolivia.com, *Gobierno inaugura estación terrena de satélite Túpac Katari en La Guardia* (Jun. 19, 2013), available at https://www.bolivia.com/tecnologia/actualidad/sdi/77602/gobierno-inaugura-estacion-terrena-de-satelite-tupac-katari-en-la-guardia.

[97] *Id.*

[98] Miguel Contreras, *Agencia Boliviana Espacial A Decade After Entering Space* (Oct. 22, 2021), available at https://www.unoosa.org/documents/pdf/psa/activities/2021/UNIAF/1a_15_contreras.pdf.

[99] Samuel Dumesh, *China's Footprint in Bolivian Space,* American Security Project (July 14, 2025), available at https://www.americansecurityproject.org/national-security-and-space/chinas-space-infrastructure-diplomacy/chinas-footprint-in-bolivian-space/.

[100] Christian Galindo, *En El Alto Instalan 6 Antenas Para el Satélite Túpac Katari*, La Razon Hemeroteca (May 15, 2013), available at https://hemeroteca.larazon.bo/sociedad/2013/05/15/en-el-alto-instalan-6-antenas-para-el-satelite-tupac-katari/.

[101] Telecombol, *La Base Terrena De Amachuma Ya Tiene Armadas Las Seis Antenas* (Aug. 8, 2013), available at https://www.telecombol.com/2013/08/la-base-terrena-de-amachuma-ya-tiene.html.

[102] *Id.*

[103] The Diplomat, *China-Latin America Space Cooperation: An Overview*, The Diplomat (Feb. 16, 2024), available at https://thediplomat.com/2024/02/china-latin-america-space-cooperation-an-overview/.

[104] ABE Strategic Plan at 10.

[105] Cate Cadell & Marcelo Perez del Carpio, *A Growing Footprint for China's Space Program Worries Pentagon*, Washington Post (Nov. 21, 2025), available at https://www.washingtonpost.com/world/interactive/2023/china-space-program-south-america-defense/.

[106] *Id.*

[107] National Astronomical Observatories of China, *NAOC News: CASSACA Partnership* (May 26, 2015), available at https://web.archive.org/web/20250813215411/http://english.nao.cas.cn/ns/NAOC_News/201505/t20150526_147715.html.

[108] National Astronomical Observatories of China, Chinese Academy of Sciences South America Center for Astronomy (CASSACA) (Mar. 29, 2017), available at https://english.nao.cas.cn/ic2015/icp2015/201703/t20170329_175454.html.

[109] Universidad Catolica del Norte, China's NAOC and UCN Launched a Joint Astronomical Project at Cerro Ventarrones [NAOC de China y la UCN Dieron el Vamos a Proyecto Astronómico Conjunto en Cerro Ventarrones] (last visited on Feb. 4, 2026), available at https://www.ucn.cl/comunicaciones-ucn/noticias/naoc-de-china-y-la-ucn-dieron-el-vamos-a-proyecto-astronomico-conjunto-en-cerro-ventarrones/.

[110] *Id.*

[111] Newsweek, *China and Chile Expand Aerospace Security Ties* (2024), available at https://www.newsweek.com/china-chile-us-space-observatory-astronomy-security-2061691.

[112] AP News, *Chile-China Rivalry Over Space Telescope* (2024), available at https://apnews.com/article/chile-china-trump-administration-rivalry-space-telescope-03a34982368de0748070b36d94cfd355.

[113] Ex-Ante, *Government Freezes Chinese Astronomical Project After U.S. Pushback [Observatorio chino: Gobierno congela proyecto astronómico tras rechazo de EE.UU.]* (2024), available at https://www.ex-ante.cl/observatorio-chino-gobierno-congela-proyecto-astronomico-tras-rechazo-de-ee-uu/.

[114] Matthew P. Funaiole et al., Eyes on the Skies China's Growing Space Footprint in South America, Center for Strategic and International Studies (Oct. 4, 2022), available at https://features.csis.org/hiddenreach/china-ground-stations-space/.

[115] Rueters, *Swedish Space Company Halts New Business Helping China Operate Satellites,* Business Recorder (Sept. 22, 2020), available at https://www.brecorder.com/news/40020218.

[116] Svt Nyheter, *FOI warns against Swedish space cooperation with China* (Jan 13, 2019), available at https://www.svt.se/nyheter/inrikes/foi-varnar-for-svenskt-rymdsamarbete-med-kina.

[117] Matthew P. Funaiole et al., Eyes on the Skies China's Growing Space Footprint in South America, Center for Strategic and International Studies (Oct. 4, 2022), available at https://features.csis.org/hiddenreach/china-ground-stations-space/.

[118] Permanent Secretariat of Forum for Economic and Trade Co-operation between China and Portuguese-speaking Countries (Macao), Sino-Brazilian partnership to build satellite ground station (Aug. 26, 2020), available at https://www.forumchinaplp.org.mo/en/economic_trade/view/4962.

[119] ArcGSIS, Chinese Satellite Facilities, available at https://www.arcgis.com/apps/dashboards/d0eccaffec184b02bcb59402f28d1725.

[120] China Academy of Space Technology [中国空间技术研究院], *A Data-Driven Look at "Tianlian" | Understanding My Country's "Data Relay Satellite Team"* *[数读"天链" | 一文了解我国"数据中继卫星天团"]* (Jul. 13, 2022), available at https://web.archive.org/web/20250626183745/https://www.cast.cn/news/7442.

[121] Alya Space, *The Sky is Not the Limit It is Only the First Step* (last accessed Jan. 8, 2026), available at https://web.archive.org/web/20250115234801/https://alyaspace.com/.

[122] SpaceWatch Global, Brazilian Start-up ALYA Nanosatellites Gains First Partnership Agreements (Aug. 2020), archived May 25, 2024, available at https://web.archive.org/web/20240525143049/https://spacewatch.global/2020/08/brazilian-start-up-alya-nanosatellites-gains-first-partnership-agreements/.

[123] *Id.*

[124] Satellite Evolution, Space Forum ICT Spring to Address Cybersecurity and Supply Chain (Sept. 10, 2020), available at https://www.satelliteevolution.com/post/2020/09/10/space-forum-ict-spring-to-address-cybersecurity-supply-chain-fintech-and-ai.

[125] *Id.*

[126] CETC 20th Research Inst. [中国电子科技集团公司第二十研究所], Remote Sensing Satellite Ground Station Infrastructure [遥感卫星地面站基础设施] (archived Feb. 12, 2026), available at https://web.archive.org/web/20260212171602/https://20.cetc.com.cn/zgdk/1593322/1593325/2114040/index.html.

[127] *Id.*

[128] *Id.*

[129] BINGO Telescope, *International Collaboration*, University of São Paulo, available at https://portal.if.usp.br/bingotelescope/en/node/368.
[130] BINGO Telescope, *Scientific Objectives* (last accessed Feb. 4, 2026), available at https://portal.if.usp.br/bingotelescope/node/364.
[131] BINGO Telescope, *Project Partners [Parceiros do Projeto]* (last accessed Feb. 4, 2026), available at https://portal.if.usp.br/bingotelescope/pt-br/node/407.
[132] BINGO Telescope, *Instrument Specifications* (last accessed Feb. 4, 2026), available at https://portal.if.usp.br/bingotelescope/pt-br/node/406.
[133] *Id.*
[134] Bingo Telescope, *Science* (last accessed Feb. 4, 2026), available at https://bingotelescope.org/science/.
[135] R.A.A. Journal, Deep Space Communication and Navigation Performance (Jan. 2024), available at https://www.raa-journal.org/issues/all/2024/v24n1/202401/P020240130537890230325.pdf.
[136] C.A. Wu et al., The BINGO Project: Cosmology with 21cm Intensity Mapping (2018) at 2, available at https://arxiv.org/pdf/1811.09464.
[137] Challenges in Space at 16-17.
[138] Zohaib Altaf, As More Countries Enter Space, the Boundary Between Civilian and Military Enterprise is Blurring. Dangerously, Bulletin of the Atomic Scientists (Apr. 9, 2025), available at https://thebulletin.org/2025/04/as-more-countries-enter-space-the-boundary-between-civilian-and-military-enterprise-is-blurring-dangerously/.
[139] Matthew P. Funaiole, Brian Hart, and Aidan Powers-Riggs, *In China's Orbit: Beijing's Space Diplomacy in the Global South* (Jan. 16, 2026), available at https://features.csis.org/hiddenreach/china-space-diplomacy-global-south/.
[140] *Id.*
[141] Zhang Xuesong, *My Country's Reconnaissance Satellite Capabilities are Second Only to the United States [我国侦察卫星实力仅次于美国]*, Collaborative Innovation Center of Geospatial Technology (Nov. 25, 2014), *available at* https://web.archive.org/web/20250520211331/https://innogst.whu.edu.cn/detail.jsp?id=y0i3pm74cm.
[142] Xinhua, *China's Two New Radio Telescopes Put into Use to Support Deep Space Exploration* (Dec. 27, 2024), available at https://web.archive.org/web/20241230073957/https://english.www.gov.cn/news/202412/27/content_WS676e56b4c6d0868f4e8ee505.html.
[143] Center for Astrophysics, *Very Long Baseline Interferometry*, Harvard & Smithsonian, available at https://www.cfa.harvard.edu/research/topic/very-long-baseline-interferometry.
[144] Peter Wood, Alex Stone, and Taylor A. Lee, *China's Ground Segment: Building the Pillars of a Great Space War*, *China Aerospace Studies Institute* (2025) at 40, available at https://www.airuniversity.af.edu/Portals/10/CASI/documents/Research/Space/2021-03-01%20Chinas%20Ground%20Segment.pdf?ver=z4ogY_MrxaDurwVt-R9J6w%3d%3d.
[145] *Id* at 43.
[146] U.S. Department of War, Annoual Report to Congress: Military and Security Developments Involving the People's Republic of China, at 16 (2025), available at 2025 Annual Report to Congress: Military and Security Developments Involving the People's Republic of China.
[147] Henry Ziemer, To Prepare for a Pacific War, U.S. Must Harden Southern Flank, The Maritime Executive (Nov. 16, 2024), available at https://maritime-executive.com/editorials/to-prepare-for-a-pacific-war-u-s-must-harden-southern-flank.
[148] *Id.*