

Developing Space Programs and Cooperation in Latin America¹

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A few countries in Latin America, like Mexico, Argentina, Brazil have already achieved notable results in their own space programs even before the current wave of space activities. Smaller countries in the region, due to possible commercial gains, scientific achievements and security concerns also turned their attention towards space. The chance for cooperation with major space actors, like the United States, the European Space Agency (owning a significant base in French Guiana), or the People’s Republic of China is a tempting offer, but not without its own pitfalls. To strengthen their position and their own space programs 18 nations recently founded the Latin American and Caribbean Space Agency (Agencia Latinoamericana y Caribe a del Espacio). In this paper we shall examine the recent developments in the region’s space activity and the influence of major space powers, especially that of China and the U.S.

Keywords: Latin America, space, ALCE, Argentina, Brazil

Introduction

In recent years, the interest has increased in countries and regions which are latecomers in the space domain. They could provide new markets and be valuable partners for cooperation. Latin America even with its turbulent history and many unsolved problems offers a wide range of possibilities for domestic and foreign space endeavours. Earth observation is a key component for border supervision, environmental protection, agriculture, resource extraction, disaster control, urban planning and many other fields. Communication, including fast broadband internet, is also a boost or some say more and more a necessity for development. Latin America’s size and geographical location make the countries in the region a great candidate for the establishment of satellite ground stations or observatories. The closeness of the equator is beneficial for building launch facilities to decrease launch costs for certain projects. At the same time Latin America’s space sector – despite the opportunities and results until this point – is still in its infancy and has to cope with the

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problems of furthering domestic growth without alienating foreign capital investment and turning down offers for joint projects and still foster cooperation between Latin American countries.

The literature about the region's space sector is scarce, but growing in recent years. Gocłowska-Bolek gave an overview of the region's interest in space, showed the role of space in innovation and focused on Brazil's new era in space research. Brazil being a key space player in the region has drawn more attention to itself as early as the 2010s. Harvey and colleagues dedicated a chapter to Brazil in their book about emerging space powers. Other sources tend to analyse the subject in light of cooperation with major space powers. With the changing status quo especially prominent is the role of China and its competition with the United States. Klinger and many reports from Western think tanks and institutions examine this important aspect. Two books published in 2020 edited by Froehlich and colleagues cover a wide range of subjects from national space programs, space sustainability, transformative technology, education or even cultural heritage.

With analysing Latin America's current space activity we can discover a lot of potential for growth and cooperation with European actors. Also, examining the different trends and processes can highlight opportunities and provide valuable lessons for smaller, relatively new space-faring countries. The aim of this paper is to introduce some of the developments between 2020 and 2022, shed some light on the China–U.S. competition, give a more detailed description of the Argentinian space program and the lessons provided by it, and examine the establishment of the Latin American and Caribbean Space Agency (Agencia Latinoamericana y Caribe a del Espacio – ALCE) and its possible implications. The paper will first introduce the state of Latin America's space activity in the 21st century, especially the satellite sector, and give one example of a successful space company. Later we examine the influence of major space powers, and finally, take a look at an attempt for cooperation in the region.

The start of Latin American space programs

The start of Latin America's space activity goes back to the era of the Cold War. The most capable actors in the region were Brazil and Argentina, both were launching rockets relatively early, Argentina in 1961 (Alfa-Centauro rocket) and Brazil in 1967 (Sonda-I rocket). Ever since that they have had a significant missile development project and operated launch sites, and both established national space agencies in the 1990s.³

Brazil was under the rule of military governance between 1964 and 1984, therefore, there was a great emphasis on rocket development. Besides the testing rockets, a milestone achievement was to start the China–Brazil Earth Resources Satellite (CBRES) program in 1988.⁴

³ Bruno Victorino Sarli et al.: Review of Space Activities in South America. *Journal of Aeronautical History*, 8 (2018). 208–232.

⁴ Brian Harvey et al.: *Emerging Space Powers. The New Space Programs of Asia, the Middle East, and South America*. Chichester, Praxis Publishing, 2010.

Argentina in competition with Brazil benefited considerably from German scientists arriving into Argentina after the second world war. The space program had close ties with the military and allegedly even helped Iraq with their rocket program, but this was later suspended.⁵ A lesser-known fact is that Argentina launched the 4th animal, a rat named Belisario into space in 1967.⁶

The first astronaut from the region was the Cuban pilot Arnaldo Tamayo Mendez, on the board of Soyuz 38 launched on the 18th of September 1980. This mission was a part of the Interkosmos program, so Cuba could achieve this goal with the aid of the Soviet Union.⁷

The new space age for Latin America

The beginning of the second phase of space exploration was more like a period instead of an exact point in time. The fall of the Soviet Union, not only changed the geopolitical landscape but also human activity in space, which is strongly dependent on circumstances on Earth. The First Gulf War signalled an important transition regarding space as well, because for the first time in history a military force relied heavily on space capabilities. This transition into the new space age also got a new momentum in the 2000s due to new technologies and emerging rivalries between great space powers.

Latin American nations also saw this new trend and they quickly realised even smaller nations can benefit from space. They also realised, in case they are not seizing the opportunity they will be easily excluded from this new segment and rely on foreign entities to provide even the most essential space-based services.

It is important to note that countries in the region are part of the international space community. One of the most important organisations is *The Committee on the Peaceful Uses of Outer Space* (COPUOS) which was set up by the United Nations General Assembly in 1959. Argentina and Brazil were among the founding members. By 2021, the majority of countries in the region (17 out of 33)⁸ became member states of COPUOS.⁹ The Committee played a crucial role in creating five treaties which are still fundamental in space law. These are the Outer Space Treaty, the Rescue Agreement, the Liability Convention, the Registration Convention and the Moon Agreement. However, among Latin American countries there is great variability in how they regard these treaties. As of 1 January 2022, the Moon Agreement is only signed and ratified by eighteen countries in the world. Among them we can find Chile, Mexico, Peru, Uruguay and Venezuela. The remaining four treaties have a higher ratification rate in the region but are still not universally accepted.¹⁰

⁵ Sarli et al. (2018): op. cit.

⁶ Marina Aizen: Belisario, el rat n que fue astronauta. *Clar n*, 16 April 2017.

⁷ Spacefacts: Soyuz 38. *Space Facts*, 02 September 2021.

⁸ Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, El Salvador, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela.

⁹ Secretariat of COPUOS: Committee on the Peaceful Uses of Outer Space: Membership Evolution. *UNOOSA*, s. a.

¹⁰ COPUOS Legal Subcommittee: Status and applications of the five United Nations treaties on outer space. *COPUOS*, 28 March 2022.

An overview of current Latin American space activities

Argentina in the 2000s and 2010s continued its space program, deploying ARSAT satellites to GEO orbits, and establishing CONAE, the national space agency. Political and economic problems somewhat hindered the progress of the state-funded space program but there was a significant change due to the involvement of the private sector, as we will cover in a later subsection. Regardless of this, Argentina is one of the few countries in the region developing its own launch capabilities, like the Tronador rocket family.¹¹

Brazil invests diligently in its own space program. In 1994, Brazil established the Brazilian Space Agency (*Ag ncia Espacial Brasileira – AEB*) which is under civilian authority, in contrast to the strong military supervision of the earlier decades. The two main launch facilities are Alc ntara Launch Center (*Centro de Lan amento de Alc ntara – CLA*) and Barreira do Inferno. The former launch centre was the site of an unfortunate accident in 2003, when a VLS-1 type rocket exploded on the launch pad resulting in numerous deaths and considerable damage to the facility. The following investigation revealed many problems due to lack of funding and mismanagement. Despite this huge setback in 2004, Brazil managed to send its first missile into space, the VSB-3. In 2007 – executed jointly with Argentina – the second missile launch was also successful.¹² In the coming years Brazil completed important milestones. They sent an astronaut to ISS in 2006. In 2021, Brazil also joined the U.S. lead Artemis accord.¹³ And as many countries in the region they intend to encourage foreign investment. As an early example, they started cooperation with Russia and Ukraine, to develop rockets. The Ukrainian Cyclone-4 rocket was promising, as was the Southern Cross rocket family based on the Angara rockets.¹⁴ The high-level Russo–Brazilian cooperation did not stop by space rockets but provided many results in the area of nuclear, cyber and aviation systems.¹⁵ Another such move was to sign the Technological Safeguard Agreement in 2019 and thus enable four companies to use Alc ntara for launching their payload.¹⁶ Between 2019 and 2022, partly due to the war in Ukraine, the two countries cooperated mainly through the BRICS group, one example being the cooperative satellite network initiated by China.¹⁷

Peru launched its first space probe in 2006, and shortly the first satellite followed in 2014 as a result of a university project, which is not unusual for a new entity in the space sector. They also engaged in a project with Kursk University from Russia, and it could be noted that an arms deal contract was signed with Russia in the 2010s.¹⁸ Peru is also

¹¹ Annette Froehlich et al.: *Space Supporting Latin America. Latin America’s Emerging Space Middle Powers*. Cham, Springer, 2020. 146–184.

¹² Joanna Gocłowska-Bolek: Latin American Space Research – Challenges and Opportunities. *Transactions of the Institute of Aviation*, 4, no. 249 (2017). 24–34.

¹³ NASA: Brazil Signs Artemis Accords. *NASA*, 15 June 2021.

¹⁴ Gocłowska-Bolek (2017): op. cit.

¹⁵ Imanuela Ionescu: Brazil–Russia Military-Technical Cooperation. *Military Review*, December 2018.

¹⁶ Shelli Brunswick: Op-ed. Order and Progress – Brazil’s Second Act in Space. *Spacenews*, 17 March 2022.

¹⁷ Juan Pons: China Speeds up the Activation of a Cooperative Satellite Network with Russia, India, Brazil and South Africa. *Atalayar*, 06 June 2022.

¹⁸ Gocłowska-Bolek (2017): op. cit.

involved in research connected to Mars, through the Mars Society, helping to simulate Mars Exploration Crew missions.

Bolivia, one of the poorest countries in the region, has also launched its first satellite in 2013 but only with the help of Chinese financial and technological assistance.

Venezuela also received significant assistance from China in its own space program, thus managed to build two satellites, Venesat-1 in 2008, which is a communication satellite, and VRSS-1, a remote sensing satellite in 2012. The exchange student program is also quite significant between the two countries.¹⁹

Mexico started a satellite program in the 2000s, and in 2009 launched SatMex, a company bought in 2014 by Eutelmex, a European company. Ever since the acquisition, Mexico and Eutelmex are conducting joint research programs to further develop satellites. Budgetary problems are constant for the Mexican Space Agency (founded in 2011) but they are dedicated to implement space strategies and enhance cooperation with foreign entities.²⁰

Chile was one of the countries with the earliest space facilities. In 1957, they already had two locations for NASA. One was later closed, the other one was sold to a Swedish company in 2009. In 1998 they could launch their first satellite. They are mostly interested in earth observation and communication.²¹

Although the Bogota Declaration²² in 1976 is connected to Colombia, the country can also be considered a latecomer and started a more serious space endeavour in 2007. The main goal is to set up a strong foundation for a space industry in the area of Medell n. However, there is an ongoing debate among Colombian decision-makers if they should buy images or deploy their own imaging capability in space.²³

Satellites

According to the Satellite Database of the Union of Concerned Scientists as of 1 January 2022, the number of satellites operated by Latin American countries were the following:

¹⁹ Sarli et al. (2018): op. cit.

²⁰ Froehlich et al. (2020): op. cit. 334–398.

²¹ Froehlich et al. (2020): op. cit. 276–303.

²² Also known as the Declaration of the First Meeting of Equatorial Countries, made and signed by seven countries. They attempted to assert sovereignty over parts of the geostationary orbit which are constantly over their nations' territory.

²³ Sarli et al. (2018): op. cit.

Table 1: Number of Latin American Satellites (as of 1 January 2022)

Argentina	30
Bolivia	1
Brazil	13
Chile	1
Colombia	1
Ecuador	1
Mexico	7
Paraguay	1
Peru	1
Venezuela	2
China/Brazil	2
USA/Japan/Brazil	1
USA/Argentina	4
Total	65

Source: Compiled by the author based on Union of Concerned Scientists (2022): op. cit.

As we can see based on this table Argentina is in the lead and we will cover the reasons shortly. Second is Brazil, third is Mexico, and the remaining countries had 1 or 2 active satellites. It is interesting to see that 7 satellites are operated jointly with other nations. The two biggest space powers in the region are Argentina and Brazil; therefore, there is not much of a surprise that they are the ones involved in these projects.

After adding the number of the 11 satellites (10 for Argentina, 1 for Brazil) which have been launched since the 1st of January 2022, we come to a result of 76 satellites in orbit. We can also take a look on the distribution of main operators and the purpose of Latin American satellites.

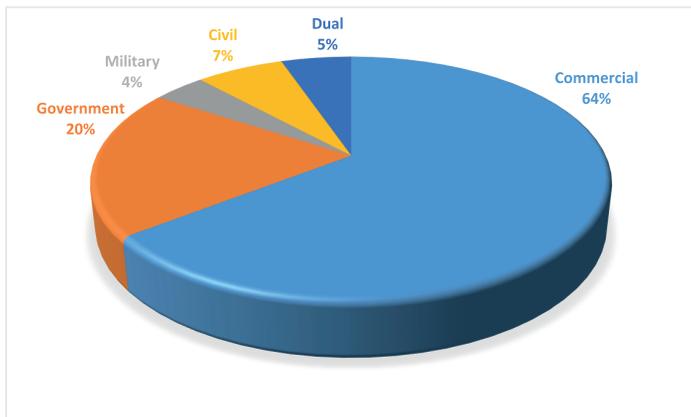


Figure 1: Latin American satellite operators by sector (as of 28 May 2022)

Source: Compiled by the author based on Union of Concerned Scientists (2022): op. cit.; Gunter’s Space Page (2022a): op. cit.

It is clearly visible that the commercial sector is dominant, so the region's distribution by sectors seems to follow recent international trends. There is a significant shift towards the commercial applications of space, but in Latin America there is no sign of build-up in the military domain, which can be observed by major space powers. It is also worth to add that this overweight of the commercial sector is mainly due to Argentina, and two of its projects. Before introducing these projects we must take a look at the purpose of active satellites.

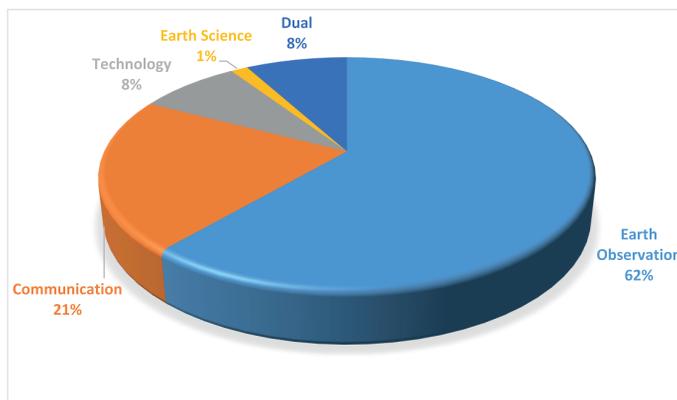


Figure 2: Purpose of Latin American satellites (as of 28 May 2022)

Source: Compiled by the author based on Union of Concerned Scientists (2022): *op. cit.*; Gunter's Space Page (2022a): *op. cit.*

The example of a successful startup – Satellogic

One of the most ambitious and interesting project is the Aleph-1 constellation. The constellation is still in the deployment phase, according to plans the constellation will have 90 satellites. It was built by Satellogic S. A. a company founded in 2010, and now with multiple offices around the world, their HQ is in Montevideo, Uruguay.²⁴ The structure of the company is vertical, meaning they design and build their own satellites, but also provide next-level services based on these capacities like imagery and data analysis. Satellogic also started to trade its shares on the American stock market Nasdaq, to acquire more capital. The initial entry into the market was favourable, how they will perform later on is yet to be seen.²⁵

The company owns a significant portion of Argentinian satellites. According to the UCS database 21 out of 30 satellites belonged to Satellogic.²⁶ In the first half of 2022, the company launched an additional 9 satellites, 5 on the 1st of April 2022, and the rest on the 25th of May 2022, thus Aleph-1 reaching 31 satellites in orbit and the number

²⁴ Satellogic (<https://satellogic.com/company/contact-us/>).

²⁵ Marketwatch (www.marketwatch.com/investing/stock/sat).

²⁶ Union of Concerned Scientist (2022): *op. cit.*

of Argentinian satellites has risen to 39.²⁷ This follows international trends, because the significant increase in satellites are usually due to constellation deployments, like OneWeb, Starlink and other constellations soon to follow. The recent launches were conducted by SpaceX Falcon-9 rockets, but previously Chinese Long March rockets and even a European Vega rocket were used, adapting to lower prices and available launch windows. The satellite type is  NuSat, developed and built by Satellogic after they gathered enough expertise during the BugSat and CubeBug programs.  NuSats are identical earth observation satellites, with 37.5 kg in mass and imaging systems operating in the visible and the infrared spectrum. The aim is to provide commercially available real-time Earth imaging and video for customers, with a ground resolution of 1 meter.²⁸

Satellogic is a great example for a latecomer company that could find a small niche in an already well-developed space sector. This is the viable route for most startups and countries joining in the second space age. Using already developed and reliable capabilities (like rockets of different companies) makes sense instead of engaging in a costly and long development program of their own.

China, the U.S. and other major space actors in the region

As mentioned previously, relatively latecomer companies and countries can build their own strategy on already existing capabilities. But a considerable strategic disadvantage is that at the same time they are dependent on these first-line service providers. Disruptions in the supply chains, political turmoil, conflicts, natural disasters, or business competitors can severely limit or even halt space activity for countries and companies.

One strategy might be to choose between multiple offers and pick the best provider based on financial or political reasons. But major space powers try to gain an advantage in the region and try to convince local entities to pick their services. However, when they cannot offer their own capacities, they might try to stop picking the main rival's offer, and favour more neutral choices. Therefore, local governments and companies can choose between Chinese, American, European, or other actors with a launch capacity and try to maintain some kind of balance and freedom of decision. Yet this still does not fully solve the problem of lacking their own launch capacity, and without that true space autonomy is not possible. Brazil and Argentina have their own rocket development program with considerably good results, yet they could also benefit from pooling resources and cooperation with other countries in the region. This can also aid the integration of the continent, boost the economy and a backup plan can give them a better position when negotiating with foreign entities.

The presence of major powers in Latin America is a problematic phenomenon. The FDI, technological know-how or even the chance to take part in different projects is valuable for countries in the region. On the other hand, there is a danger of getting too much under the influence of any foreign entity. The problem of how to strengthen their

²⁷ Gunther's Space Page (2022a): op. cit.

²⁸ Gunther's Space Page:  NuSat 1. *Space.skyrocket*, 26 May 2022b.

positions without needlessly antagonising any major powers or potential partners is a core problem of international relations.

Traditionally, Latin America was considered a region of high interest for the United States. While the U.S. pays more and more attention to the Pacific region, a prominent review commission came to the conclusion that they neglected this important area, and therefore China managed to gain a significant foothold.²⁹ European powers or Russia are also present in the region, but their weight cannot be compared to the U.S. and China. In recent years Beijing granted numerous loans to governments and state-owned enterprises through China’s policy banks (China Development Bank – CDB, and China ExIm Bank), mainly in the 2010s. Clearly, the focus was on the energy sector, but infrastructural developments, mining and other small scale programs were also significant.

The following graph shows only the biggest beneficiaries of the Chinese loan programs, with amounts received over 1 billion USD. But at least 12 more countries got some kind of loans from Beijing, and this excludes the amounts received from commercial banks (Bank of China, China Construction Banks, etc.). The 5 biggest borrowers are Venezuela (62.5 billion USD), Brazil (30.5 billion USD), Ecuador (18.2 billion USD), Argentina (17 billion USD) and Bolivia (3.2 billion USD).³⁰

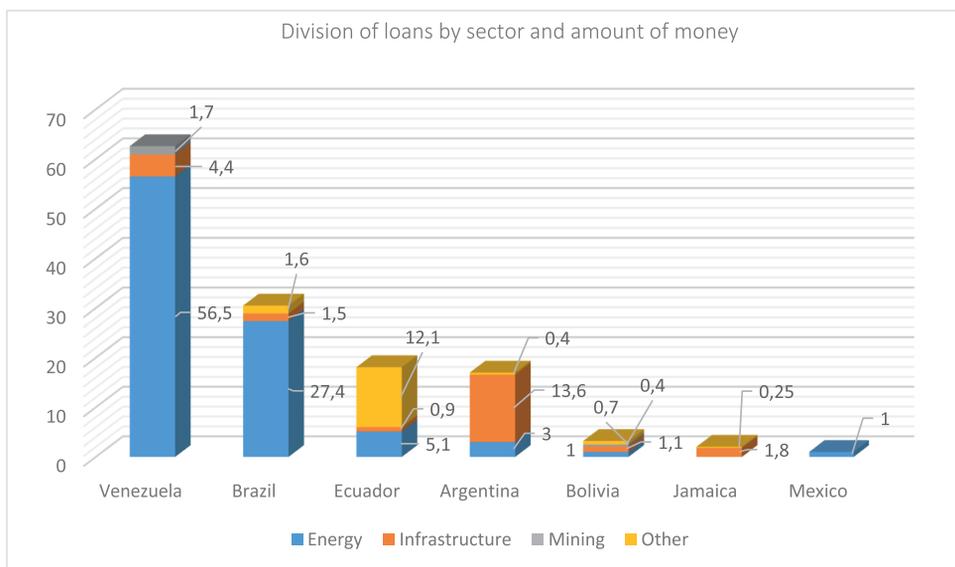


Figure 3: Latin American countries with over 1 billion USD loans from China

Source: Gallagher–Myers (2022): *op. cit.*

The U.S. did notice the increase in Chinese investments and the growing influence of China. A 2022 Congress report estimated that apart from these loans, between 2005 and

²⁹ U.S.–China Economic and Security Review Commission: 2021 Annual Report to Congress: China’s Influence in Latin America and the Caribbean. *USCC*, 20 May 2021.

³⁰ Kevin P. Gallagher – Margaret Myers: China-Latin America Finance Database. *The Dialogue*, 20 May 2022.

2021 China invested 140 billion USD in the region. Brazil accounted for 64 billion and Peru 25 billion USD. 59% of the investment went to the energy sector, but 24% to metals/mining. The shift towards mining in the investment area compared to loans is noticeable.³¹

The biggest borrowers (see Figure 3) all received significant help in their national space programs, as well. According to a report issued by the U.S.–China Economic and Security Review Commission until 2021 China helped to develop and launch at least 21 satellites: 10 for Argentina, 6 for Brazil, 3 for Venezuela, 1 for Bolivia and 1 for Ecuador. Bolivia’s satellite was financed with a loan from one of the above-mentioned policy banks, the China Development Bank.³² China’s involvement in the region including space cooperation – even though alarmist voices from the U.S. might say otherwise – is not a recent occurrence, it has a decade-old history and is based on the ideology of the South–South cooperation, in order to achieve more independence from the North. One of the earliest examples for this is the successful China–Brazil joint earth observation program to develop the China–Brazil Earth Resources Satellite (CBERS) network. This program already started in the 1980s and was a notable step towards data independency. The Asia-Pacific Space Cooperation Organization (APSCO) also have members like Pakistan or Iran, not just Latin American countries and China. The autonomy of the South is also represented in the documents. In 2015, the organisation issued a statement which recognised that China’s Belt and Road Initiative is in alignment with APSCO’s goals.³³ Currently, the only Latin American member is Peru, but other countries send observers and are interested in cooperation.³⁴ This might increase as soon as the planned data service platform and the Joint Small Multi-mission Satellite Constellation becomes functional. China reaffirmed its dedication towards the programs and further cooperate with countries in the region.³⁵

Besides the possible benefits, there are some concerns as well. The Commander of the U.S. Southern Command, Admiral Craig S. Faller gave a speech about U.S.–China strategic competition in the Western Hemisphere. According to him, China uses the loans and other kinds of connections to convert these assets to hard power and sometimes even coerce its partners into deals, which they could not refuse due to economic dependencies.³⁶ The issues about the Chinese satellite tracking station close to Neuqu n in Argentina raised concerns not just among U.S. analysts, who claimed that the station is used to spy on American satellites. But the opposition also had some questions about the deal with China which does not seem all that beneficiary to Argentina. The station is in operation since 2018, China does not have to pay taxes or rent for the 50 years of using the area. Argentina in return got 10% of the antenna’s operation time. The station is operated by the China Launching and Satellite Control General (CLTC) which is under the command of

³¹ Congressional Research Service: China’s Engagement with Latin America and the Caribbean. *Sgp*, 4 May 2022.

³² U.S.–China Economic and Security Review Commission (2021): op. cit.

³³ Julia Michelle Klinger: A Brief History of Outer Space Cooperation Between Latin America and China. *Journal of Latin American Geography*, 17, no. 2 (2018). 46–83.

³⁴ Asia-Pacific Space Cooperation Organization: Member States. *Apsco*, 20 February 2019.

³⁵ China National Space Administration: China’s Space Program: A 2021 Perspective. *CNSA*, 28 January 2022.

³⁶ Project 2049 Institute: Near and Present Danger: SOUTHCOM Commander ADM Faller on U.S.–China Strategic Competition in the Western Hemisphere. *Project2049*, 15 June 2021.

the People’s Liberation Army. The government claims that there are no secret activities going on, the contract does not have secret appendixes and emphasises the benefit for the region.³⁷ Sceptics on the other hand point out the dubious wording of some of the articles in the contract and are worried about the lack of oversight, and the violation of Argentinian sovereignty. Considering that space technology is dual-use in most cases, identifying the nature of the activity is uncertain without control.³⁸ Some Argentinian analysts think it is *de facto* a military base.³⁹ In 2021, the government announced that in Rio Gallegos, a town close to the South pole, a Chinese–Argentinian joint venture will build a satellite ground station. The Chinese firm, Beijing Aerospace Yuxing Technology Co. Ltd. (Satelliteherd) has partners affiliated with the Chinese military.⁴⁰ Many are worried that economic problems, the effect of Covid and other factors might give a chance to China to further gain influence in Latin America. The U.S. Congress proclaimed that they will counter Chinese efforts in Latin America in multiple areas.⁴¹ In addition, a change of strategies and attitudes might be in order, because China has a much more pragmatic approach tailored to every country in the region, while the U.S. seems to focus on warnings about long-term consequences and a top-down approach.⁴² The response has to be swift because China increased its share in trade in Latin America and 20 countries already joined the Belt and Road initiative. Most of them also recognised the PRC’s claim on Taiwan. Apart from Neuqu n, China has satellite ground stations in Bolivia, Brazil, Ecuador and Venezuela.⁴³

Besides the U.S. and China, Russia, the EU and Japan are also interested in space cooperation. The European Space Agency (ESA) has a satellite tracking station in Argentina, close to Malag en. The facility is quite sophisticated and is a key component in ESA’s global tracking network. However, the conditions are very different, because ESA is a strictly non-military organisation, unlike CLTC. Therefore, the station never raised such concerns, not even among the Argentinian opposition. The European presence in the region is further enhanced by the Guiana Space Center near Kourou, a sophisticated base with launch pads for Ariane and Soyuz rockets and a tracking station.⁴⁴

As mentioned previously, Russia and Ukraine were also active in the region, and previously launched payloads for Latin American countries and engaged in joint research programs. Russia had a contingent of scientists and technicians in the European space launch centre in Kourou, because ESA and other actors used Soyuz rockets to launch payloads from this location. In February 2022, Moscow announced that it will withdraw this personnel as a response to European sanctions implemented against Russia for

³⁷ Olivia Sohr: Cinco puntos para entender la estaci n espacial china en Neuqu n. *Chequeado*, 10 February 2015.

³⁸ Zyri: Chinese Space Base in Neuqu n: What Uses Did Argentina Give It in the Last Decade. *Zyri*, 27 March 2022.

³⁹ Ignacio Conese: How China Solidified Its Foothold in Latin America through a Space Centre. *TRTWorld*, 17 March 2020.

⁴⁰ ANI: China Space Contractor to Install New Satellite Ground Station in Southern Argentina: Report. *ANI News*, 29 May 2021.

⁴¹ Congressional Research Service (2022): op. cit.

⁴² Thiago de Aragao: The US Still Doesn’t Understand China’s Strategy in Latin America. *The Diplomat*, 08 September 2021.

⁴³ Diana Roy: China’s Growing Influence in Latin America. *Council on Foreign Relations*, 12 April 2022.

⁴⁴ The European Space Agency: Launch site. *ESA*, 20 May 2021.

attacking Ukraine.⁴⁵ To what degree and when these two countries might be returning to play an active role in Latin America's space activity is yet to be seen.

The joint Latin American initiative

The idea of Latin American cooperation in space activities is not a new one. The region had different organisations set up previously to strengthen ties between the countries. One of them was UNASUR (*Uni n de Naciones Suramericanas*). The organisation was established in 2008, but as it seems the initiative failed by the end of the 2010s and only 4 members remained in the organisation.⁴⁶ In 2011, however, when prospects seemed more optimistic, they proposed the establishment of a South American Space Agency. This was in the interest of many countries, especially for financial reasons, including regional powers like Argentina and Brazil, the later especially keen on cooperation after the bankruptcy of the Brazilian defence industry in the 1990s.⁴⁷

There is also some rivalry in the background, due to public image and the competition to attract projects and investment to one's country. The two most capable countries Brazil and Argentina engage in this kind of competition, but also can work together on programs like nuclear reactor development.⁴⁸ Potentially, these could be used as a future energy source for space vehicles. Personal and ideological conflicts also influence the outcome of projects. Brazilian President Jair Bolsonaro and Alberto Fern andez the President of Argentina are known to exchange regular insults, so cooperation is rather difficult.⁴⁹

The tensions between Brazil and other nations in the region added significantly to the decision of Mexico and Argentina that they will spearhead the creation of Latin American and Caribbean Space Agency (*Agencia Latinoamericana y Caribe a del Espacio – ALCE*). In September 2021, seven countries signed the agreement to establish the agency.⁵⁰ The proposed model the agreement wishes to implement is similar to that of ESA. National space programs would still continue but in addition member states would have joint projects.⁵¹ The number of members soon grew to nineteen and more countries are expected to join. Brazil, Columbia and Chile are not among them, but Cuba is.⁵² If the region cannot get over ideological and personal differences, the initiative might fail just like UNASUR. The HQ of the agency is in Mexico. The declared goals are capacity sharing, the design

⁴⁵ Jeff Foust: Russia Halts Soyuz Launches from French Guiana. *Spacenews*, 26 February 2022.

⁴⁶ In 2018 six countries suspended their membership. Later Colombia, Brazil, Ecuador, Argentina and Uruguay even announced that they would withdraw from UNASUR, and some of them joined PROSUR (*Foro para el Progreso e integraci n de Am rica del Sur*).

⁴⁷ Go łowska-Bolek (2017): op. cit.

⁴⁸ Go łowska-Bolek (2017): op. cit.

⁴⁹ DW: Alberto Fern andez pide a Bolonaro dejar sus „diferencias” e impulsar Mercosur. *Deutsche Welle*, 31 November 2020.

⁵⁰ Argentina, Mexico, Bolivia, Ecuador, Paraguay, Honduras and Costa Rica.

⁵¹ Christian Santana: El despegue de el Agencia Latinoamericana del Espacio. *Universidad de Navarra*, 17 January 2022.

⁵² Government of Mexico: M xico ser  sede de la Agencia Latinoamericana y Caribe a del Espacio. *Gobierno de M xico*, 16 March 2022.

and launch of a nanosatellite, and increasing independence from foreign space powers.⁵³ This need for independent space capacities is felt throughout the region. For example, in November 2020 Mexico had to ask for the help of the EU to evaluate the damages caused by Hurricane Eta in the southeastern part of the country. The Copernicus Emergency Management Service (CEMS) could carry out this task, and provide information that only geospatial information can provide.⁵⁴

Another problem will be the financing of the agency. The original budget for ALCE was around 100 million USD, very small compared to the budget of NASA or ESA.⁵⁵ Countries like Brazil, Argentina or Peru could afford the minimum estimate of 5.5 million USD per year for operational costs, but smaller countries might relocate funding, or wait for the end of the election cycle.⁵⁶ This is the same problem that U.S. officials are facing in the region when they are trying to argue against involvement with the Chinese, reminding decision-makers on long-term effects. Short term benefits often overrule the longer strategic perspectives. Besides the budget and time perspective problem, there is also the problem of differences between member states in the technological and infrastructural backgrounds. It will be highly difficult to coordinate research when even the most basic elements are missing in some countries. Ecuador even shot down its own space agency in 2018 as a part of economic austerity measures. The involvement of the private sector could be key to solve this problem.⁵⁷ In return, the private sector can benefit a lot from institutional support. One example for this is Dereum Labs. The Mexican start-up company could sign a contract with Airbus in 2021 about jointly taking part in resource exploration on the Moon. The support of Mexico's space agency (AEM) was crucial for the deal because through the agency Dereum Labs has access to research facilities and other projects.⁵⁸

Conclusion

As established in the current paper, Latin America has a lot of potential in the space domain. The interest of major space powers and the business community is understandable due to the region's resources, population, need for development and strategic importance. Countries in Latin America – just like any other aspiring and new space-faring nation – must carefully balance the benefits and drawbacks of foreign investment, especially the role of China. They also must find ways to enhance cooperation between each other, and support local startups and initiatives with financial and legal means while providing the necessary infrastructure and connections to increase competitiveness in the global space markets. According to most experts, budgetary restraints and political division will

⁵³ Myriam Vidal Valero: Latin America's Moonshot. *Slate*, 06 May 2021.

⁵⁴ Delegation of the European Union to Mexico: La Uni n Europea apoya a M xico a enfrentar las inundaciones em el sureste con mapeo. *EEAS Europa*, 18 November 2020.

⁵⁵ Santana (2022): op. cit.

⁵⁶ Juan Pablo Espinosa: A New Kid on the Block: ALCE – Latin America's Space Agency. *GU Space Initiative*, 13 January 2021.

⁵⁷ Vidal Valero (2021): op. cit.

⁵⁸ Ana Campoy: Why Latin America Needs Its Own Space Agency. *Quartz*, 20 January 2022.

be a prevalent problem in the near future. Harmonising cooperation between different political-ideological blocks and highly varying development levels is also a challenge. The establishment of ALCE or the chance for commercial entities to reach across borders could be a possible solution if decision makers do not lose sight of long-term benefits in favour of short-term gains. European institutions and countries can enter this sector due to having a positive reputation without the heavy political burdens and opinions attached to the U.S. and China. The region can provide important lessons and warnings to other newcomers in the space sector, highlighting the need for a focused and driven plan and execution, aiming to find a chance for cooperation and a specific field of expertise.

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