

# State Actor Strategies in Attracting Space Sector Partnerships: Chinese and Russian Economic and Financial Footprints

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This project was conducted by the Prague Security Studies Institute (PSSI). The analyses, findings and recommendations are those of PSSI alone.

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# Abstract

This project introduces a new risk category into the space security policy portfolio, namely the economic and financial (E&F) space hybrid operations of non-democratic governments. These are defined as activities in the international trading and financial systems often conducted for strategic, rather than purely commercial, purposes. The report focuses on China and Russia as the primary actors with respect to engaging in such space hybrid operations on a global scale, free of democratic debate, processes, and election cycles. State-owned or -controlled enterprises (SOEs) of these state actors often serve as forward-deployed assets executing space-related partnerships. The project describes the Chinese and Russian model for forging international space partnerships that generally involve the purposeful building of vertically-integrated dependencies, often on a sole-source supplier basis, which, more often than not, opens targeted countries to what PSSI terms “space sector capture” (either partial or complete).



# Project Overview

This project, launched in September 2018, introduces a new risk category into the space security policy portfolio, namely the economic and financial (E&F) space hybrid operations of non-democratic governments. These are defined as activities in the international trading and financial systems often conducted for strategic, rather than purely commercial, purposes. The report focused on China and Russia as the primary actors with respect to engaging in such space hybrid operations on a global scale, free of democratic debate, processes, and election cycles.

A careful analysis of the Chinese and Russian models for forging international space partnerships – which are strikingly similar to one another – reveal a pattern whereby these two state actors tend to offer vertically-integrated “package deals” to targeted countries. Such “packages” frequently involve some combination of the design/manufacturing of satellite(s), launch services/launch insurance, ground segment construction/equipment, provision of operating personnel, the training of local staff, and financial assistance (e.g. in the form of generous loans on non-market terms). The resulting dependencies, fostered by “sole-source” supplier relationships, more often than not, open targeted countries to what PSSI terms “space sector capture” (either partial or complete).<sup>1</sup>

**PSSI’s Definition of Space Sector Capture** — “A state actor’s provision of space-related infrastructure/equipment, technology, launch and other services, education/training and financing ultimately designed to limit the freedom of action and independence of the recipient state’s space sector, generally implemented on an incremental basis”.

The authoritarian nature of their governments enables them to pursue strategic objectives vis-a-vis space partnerships, free of time-consuming constraints faced by democratic governments.

These space-related transactions are designed to appear benign and commercial, providing space aspirants with capabilities they crave, ostensibly to advance the prosperity and security of these targeted countries. Countries lacking a space program, adequate funding, and technical expertise are generally open to such seemingly generous offers, even if it means their countries could well become perilously dependent on these questionable outside benefactors.<sup>2</sup>

Such partnerships are, in reality, often driven by a desire to gain influence, or even control, over the nascent space sectors of the recipient countries (e.g. Belarus, Bolivia, Nigeria, Pakistan, Sri Lanka, and Venezuela). In some cases, control over the space sector has downstream strategic value in also delivering influence over other sectors that depend – or benefit from – space capabilities, such as agriculture. This influence can, in turn, translate into political influence over the country writ large.

Partnerships being used to put this architecture in place involve the use of economic and financial levers/incentives to make incremental progress toward these goals. The transactions, including offers of large-scale financing at below-market terms, are primarily for the purpose of expanding China and/or Russia’s global space footprint at a strategic level (with a number of associated operational, political, geographic and military benefits).<sup>3</sup>

This report, through the granular analysis of space-related transactions of Chinese and Russian state-owned or -controlled enterprises (SOEs), seeks to determine the extent of space sector capture in a growing number of targeted countries from the perspectives of national security risk and commercial competitiveness.

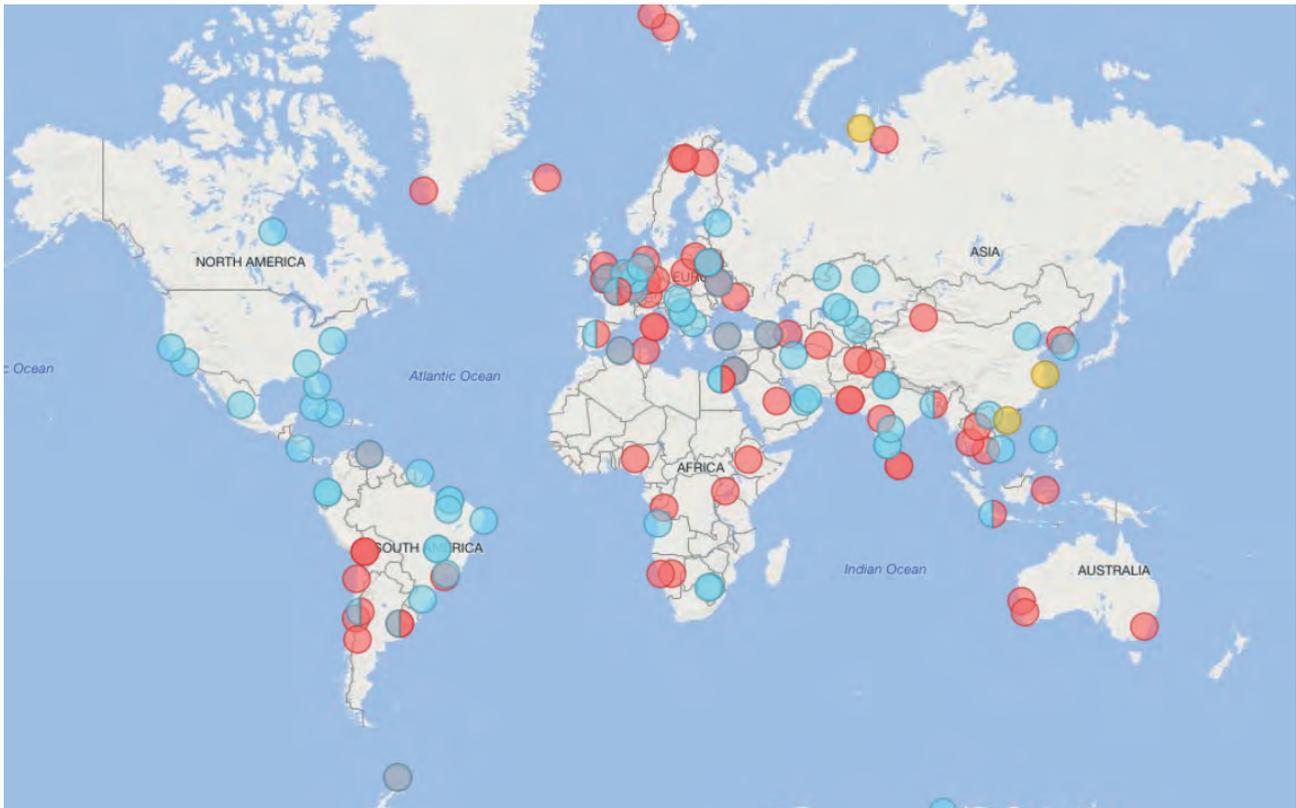
As of March 31, 2019, PSSI has identified 216 Chinese and Russian transactions in 88 countries (global map of these space transactions is shown in Figure 1, and transactions in the Arctic and Antarctica in Figures 2

1 Robinson, J. (2018). Competition for International Space Partnerships. [online] Available at: [http://www.pssi.cz/download/docs/617\\_sagar2018-presentation-robinson.pdf](http://www.pssi.cz/download/docs/617_sagar2018-presentation-robinson.pdf) [Accessed 26 Nov. 2018]. P.6  
2 Robinson, J. (2018). ‘Cross-Domain Responses to Space Hybrid Provocations via Economic and Financial Statecraft’, *USSTRATCOM 2018 Deterrence and Assurance Academic Alliance Conference*.  
3 Robinson, J. et al. (2018). Europe’s Preparedness to Respond to Space Hybrid Operations, Prague Security Studies Institute, (July 2018). p.4

and 3).<sup>4</sup> China accounted for 105 of these transactions, Russia for 94, and Russia-China together for 5 (see Figure 4). Of these transactions, 110 were active, 8 cancelled, 57 past and 41 pending (for detailed breakdown see Figure 5). Most of the transactions occurred in Latin America/Caribbean, followed by Europe (Western and Southern) and Asia (Southern and Southeast). Per region and per country breakdowns are available below in Tables 1 and 2 and in Figure 6.

Some 74 of these transactions involved some type of ground segment (GS)<sup>5</sup>. The list of recipient countries with GS transactions is available in Table 3. For GS visual maps see Figures 7-9.

The estimated value of recorded transactions is nearly \$65 billion. This number does not include, however, 136 transactions where no information on their value was available in the open source.



**Figure 1:** Global Map of Space Transactions (China in red, Russia in blue, and China-Russia in yellow)

4 The number of countries does not include what we call “international transactions”, i.e. transactions that include, besides China and/or Russia, more than one recipient country. We currently have a list of 12 such transactions.

5 Including one international transaction.

STATE ACTOR STRATEGIES IN ATTRACTING SPACE SECTOR PARTNERSHIPS:  
CHINESE AND RUSSIAN ECONOMIC AND FINANCIAL FOOTPRINTS

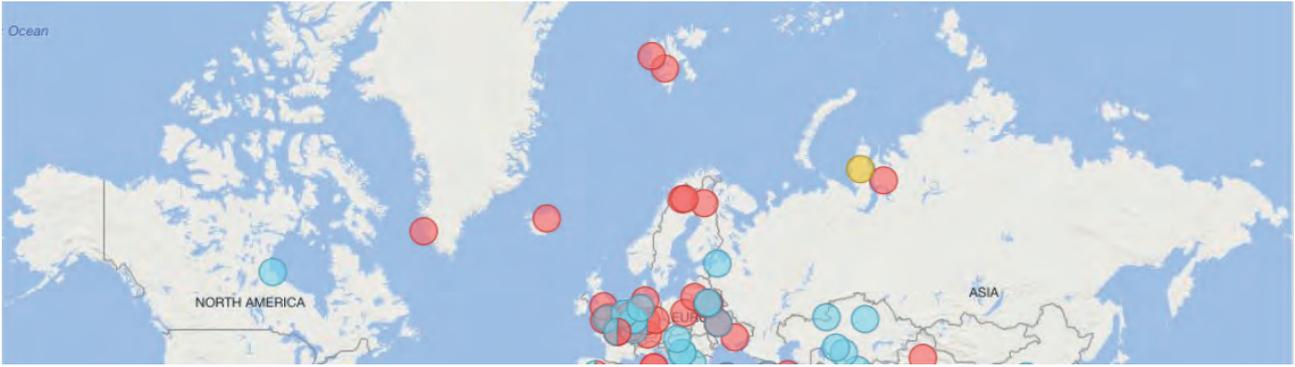


Figure 2: Map of Transactions in the Arctic (China in red, Russia in blue, and China-Russia in yellow)



Figure 3: Map of Transactions in Antarctica (China in red, Russia in blue)

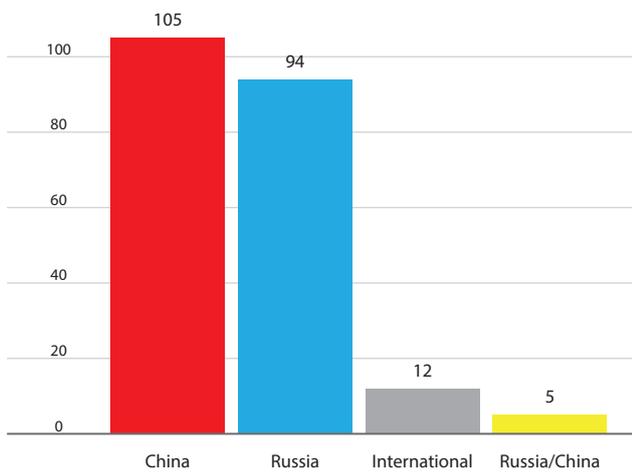


Figure 4: Number of Transactions by Source Country

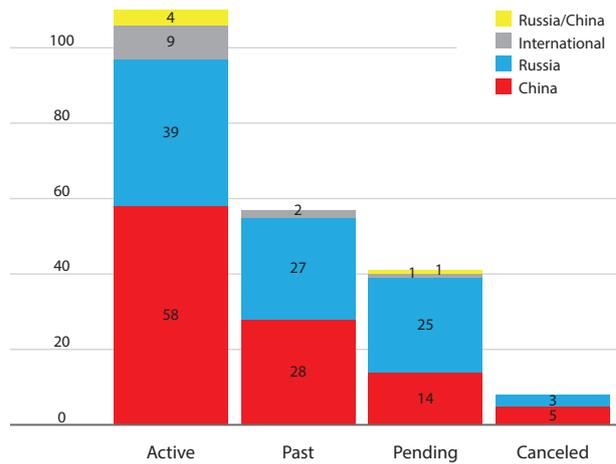


Figure 5: Number of Transactions by Status and Source Country

STATE ACTOR STRATEGIES IN ATTRACTING SPACE SECTOR PARTNERSHIPS:  
CHINESE AND RUSSIAN ECONOMIC AND FINANCIAL FOOTPRINTS

REGIONS	NUMBER OF TRANSACTIONS
Latin America and the Caribbean	37
Europe (Western and Southern)	31
Asia (South and SouthEast)	30
Africa	23
Europe (CEE)	16
Asia (Western, Central, Eastern)	15
Antarctica	14
International	12
Asia (Middle East)	10
China-Russia	10
Europe (Northern/Arctic)	7
North America	6
Australia and Oceania	5
<b>TOTAL SUM OF TRANSACTIONS</b>	<b>216</b>

Table 1: Number of Transactions by Regions

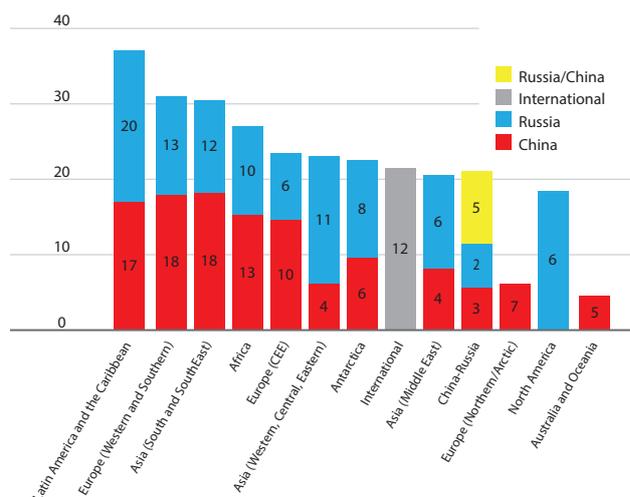


Figure 6: Number of Transactions in Regions by Source Country

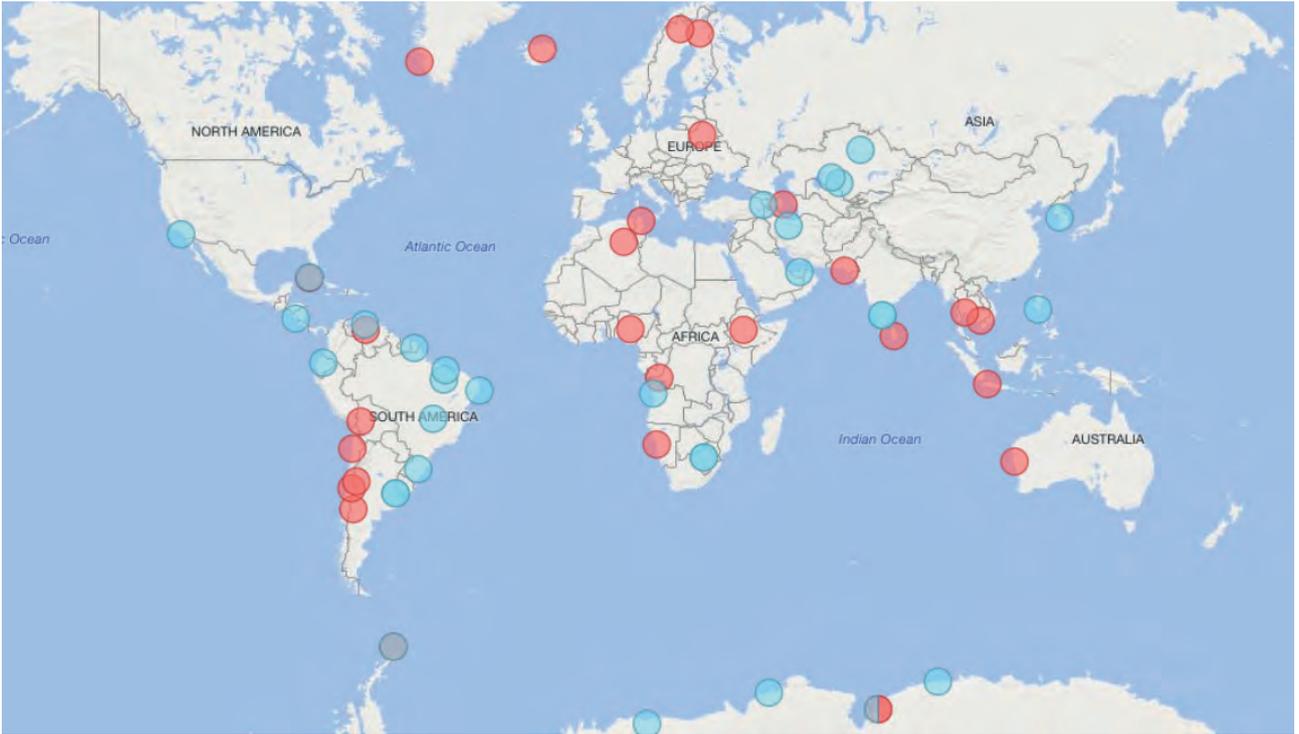
RECIPIENT COUNTRY	NO. OF TRANSACTIONS
Afghanistan	1
Algeria	1
Antarctica	6
Argentina	4
Armenia	1
Australia	3
Azerbaijan	1
Bangladesh	1
Belarus	5
Bolivia	5
Brazil	1
Cambodia	1
Congo, Democratic Republic of the	1
Cuba	1
Democratic People's Republic of Korea (North Korea)	1
Egypt	2
Ethiopia	1
Finland	1
France	4
Germany	5
Greenland	1
Chile	3
Iceland	1
Indonesia	2
Israel	2
Italy	2
Lao People's Democratic Republic	1
Lithuania	1
Luxembourg	2
Namibia	3
Netherlands	1
New Zealand	2
Nigeria	3
Norway	2
Pakistan	6
Poland	1
Russia	3
Saudi Arabia	1
Spain	1
Sri Lanka	4
Sweden	2
Thailand	2
Tunisia	1
Turkey	1
Turkmenistan	1
Uganda	1
Ukraine	3
United Kingdom	3
Venezuela	3
<b>TOTAL SUM OF CHINESE TRANSACTIONS</b>	<b>105</b>

RECIPIENT COUNTRY	NO. OF TRANSACTIONS
Algeria	1
Angola	2
Antarctica	8
Argentina	2
Armenia	1
Bangladesh	1
Belarus	2
Brazil	10
Bulgaria	1
Canada	1
Cuba	2
Ecuador	2
Egypt	2
France	4
French Guiana	1
Germany	4
Hungary	1
China	2
India	7
Indonesia	1
Iran	2
Israel	1
Kazakhstan	8
Mexico	1
Netherlands	1
Nicaragua	1
Philippines	1
Serbia	2
South Africa	5
South Korea	1
Spain	1
Turkey	1
Ukraine	2
United Arab Emirates	2
United Kingdom	1
USA	5
Uzbekistan	1
Venezuela	1
Vietnam	2
<b>TOTAL SUM OF RUSSIAN TRANSACTIONS</b>	<b>94</b>

Table 2: List of Recipient Countries and Number of Transactions (China - left, Russia - right)<sup>6</sup>

6 International transactions are not included in this table.

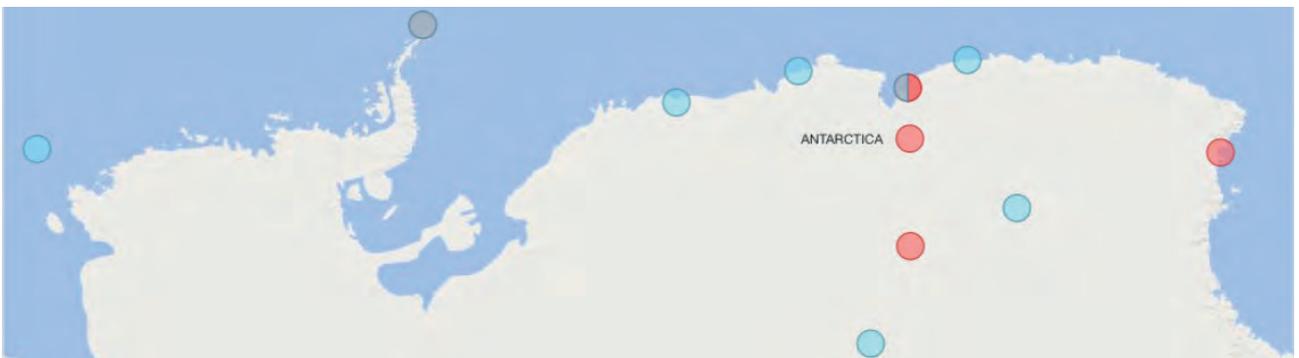
STATE ACTOR STRATEGIES IN ATTRACTING SPACE SECTOR PARTNERSHIPS:  
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**Figure 7:** Global Overview of Space Sector Ground Segment Transactions (China in red, Russia in blue).



**Figure 8:** Global Overview of Space Sector Ground Segment Transactions - Close-Up of the Arctic (China in red, Russia in blue).



**Figure 9:** Global Overview of Space Sector Ground Segment Transactions - Close-Up of Antarctica (China in red, Russia in blue).

STATE ACTOR STRATEGIES IN ATTRACTING SPACE SECTOR PARTNERSHIPS:  
CHINESE AND RUSSIAN ECONOMIC AND FINANCIAL FOOTPRINTS

RECIPIENT COUNTRY	NO. OF GS TRANSACTIONS	RECIPIENT COUNTRY	NO. OF GS TRANSACTIONS
<b>Algeria</b>	1	<b>Angola</b>	1
Ground Station	1	Ground Mission Control Center	1
<b>Antarctica</b>	6	<b>Antarctica</b>	8
GNSS	2	GNSS	4
GNSS; SSA/Optical	1	Ground Station	1
Research Station	3	Research Station	3
<b>Argentina</b>	2	<b>Argentina</b>	1
Ground Station	1	GNSS	1
SSA/Radar; SSA/Optical	1	<b>Armenia</b>	1
<b>Australia</b>	1	GNSS	1
Ground Station	1	<b>Brazil</b>	7
<b>Azerbaijan</b>	1	GNSS	5
Ground Mission Control Center	1	Launch Site	1
<b>Belarus</b>	1	SSA/Optical	1
Ground Station	1	<b>Cuba</b>	2
<b>Bolivia</b>	1	GNSS	1
Ground Station	1	Ground Station	1
<b>Cambodia</b>	1	<b>Ecuador</b>	1
Ground Station	1	GNSS	1
<b>Congo, Democratic Republic of the</b>	1	<b>French Guiana</b>	1
Ground Station	1	Launch Site	1
<b>Cuba</b>	1	<b>India</b>	2
SSA/Radar	1	GNSS	2
<b>Ethiopia</b>	1	<b>Iran</b>	1
Ground Station	1	Ground Station	1
<b>Finland</b>	1	<b>Kazakhstan</b>	5
Ground Station	1	GNSS	2
<b>Greenland</b>	1	Launch Site	3
Ground Station	1	<b>Nicaragua</b>	1
<b>Chile</b>	2	GNSS	1
Research Station; SSA/Optical	1	<b>Philippines</b>	1
SSA/Optical	1	GNSS	1
<b>Iceland</b>	1	<b>South Africa</b>	2
SSA/Optical	1	GNSS; SSA/Laser; SSA/Radar	1
<b>Indonesia</b>	1	SSA/Radar; Ground Station	1
Ground Station	1	<b>South Korea</b>	1
<b>Namibia</b>	2	GNSS	1
Ground Station	2	<b>United Arab Emirates</b>	1
<b>Nigeria</b>	1	SSA/Optical; GNSS	1
Ground Station	1	<b>USA</b>	1
<b>Norway</b>	2	Ground Mission Control Center	1
Research Station	2	<b>Venezuela</b>	1
<b>Pakistan</b>	2	GNSS	1
GNSS	1	<b>TOTAL SUM OF RUSSIAN GS TRANSACTIONS</b>	<b>38</b>
Ground Station	1		
<b>Sri Lanka</b>	1		
Research Station; Ground Station	1		
<b>Sweden</b>	1		
Ground Station	1		
<b>Thailand</b>	1		
GNSS	1		
<b>Tunisia</b>	1		
GNSS	1		
<b>Venezuela</b>	1		
Ground Station	1		
<b>TOTAL SUM OF CHINESE GS TRANSACTIONS</b>	<b>35</b>		

Table 3: List of Recipient Countries with GS Transactions with China (left) and Russia (right)<sup>7</sup>

<sup>7</sup> This table does not include 1 international GS transaction. The total of all GS transactions within the database is 73.

## II. Key Findings

- ❖ According to *Xinhua*, as of April 28, 2018, China had signed 121 space cooperation agreements with 37 countries and four international organizations.<sup>8</sup> The State Council Information Office's 2016 White Paper on China's space activities, published on January 10, 2017, stated that China had signed 43 space cooperation agreements with 29 countries, space agencies, and international organizations.<sup>9</sup> If accurate, this would mean an increase of 78 international cooperation agreements over about 15 months. As of March 31, 2019, PSSI has identified Chinese space partnerships with 49 countries.
- ❖ Unlike China, Russia has been rather cautious when it comes to declaring publicly the number of international space partnerships it has concluded. The Russian Federal Space Program 2016-2025 mentions international cooperation only marginally, emphasizing goals in technological development.<sup>10</sup> In one statement, however, Roscosmos lists Belarus, Kazakhstan and Armenia as CIS states where cooperation agreements have reached "a high degree of intensity". Other CIS states are noted as partners (i.e. Azerbaijan, Moldova, Tajikistan, Turkmenistan and Uzbekistan).<sup>11</sup> As of March 31, 2019, PSSI determined that Russia established space partnerships with 39 countries.
- ❖ The record of Chinese/Russian economic and financial activities in various regions indicates that space sector capture is being pursued with respect to both developing and developed countries. As democratic countries have more rigorous requirements for transparency, accountability and the rule of law, a more incremental approach by these non-democratic nations is visible (e.g. projects related to scientific research/development, academic exchanges, or individual commercial contracts).
- ❖ PSSI has identified two basic rationales associated with the entry of China/Russia into space partnerships globally:
  - A country's space sector is targeted for capture because its geographic position is important, or even strategic, for enhancing Chinese/Russian space capabilities (e.g. for GLONASS/Beidou, SSA, military space considerations etc.)
  - A country is not targeted primarily because of space-related considerations, but is selected for other strategic reasons that influencing/capturing the space sector helps leverage (e.g. the country's energy resources, mineral wealth, kindred geopolitical policy positions, etc.).
- ❖ Incremental space sector capture (e.g. the Arctic states) is more difficult to detect, or guard against (e.g. academic exchanges, scientific and research projects, broader funding commitments beyond the space sector, etc.). More open space sector capture largely takes place via the offering of vertically-integrated "package deals". On a number of occasions, China and Russia have been able to construct successfully dual-use space infrastructure and services due to hospitable political relations, corruption and internal economic and social strife in the targeted countries (e.g. Argentina, Brazil, Cuba, Colombia, Nicaragua, Nigeria, Pakistan, Sri Lanka, Venezuela, etc.).

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8 Fmprc.gov.cn. (2018). China strengthens international space cooperation. [online] Available at: <https://www.fmprc.gov.cn/zflt/eng/jlydh/mtsyt1555457.htm> [Accessed 6 Mar. 2019].

9 Spaceref.com. (2016). White Paper on China's Space Activities in 2016. [online] Available at: <http://www.spaceref.com/news/viewsr.html?pid=49722>; [http://english.scio.gov.cn/whitepapers/2017-01/10/content\\_40535777.htm](http://english.scio.gov.cn/whitepapers/2017-01/10/content_40535777.htm) [Accessed 6 Mar. 2019].

10 Roscosmos.ru. (2016). The main provisions of the Federal Space Program 2016-2025. [online] Available at: <https://www.roscosmos.ru/22347/> [Accessed 18 Mar. 2019].

11 Roscosmos.ru. (n.d.). Intergovernmental agreements and commissions for economic, scientific and technical cooperation. [online] Available at: <https://www.roscosmos.ru/22887/> [Accessed 18 Mar. 2019].

- ❖ State-controlled corporate enterprises generally serve as the vehicles to penetrate a specific country's space sector, sometimes through "cut-outs" without an obvious link to the Chinese/Russian governments. (e.g. China Great Wall Industry Corporation's collaboration with the Swedish State Corporation to make use of ground stations in Dongara, Australia and Santiago, Chile). These state companies position themselves as preferred "go-to" entities. This is, in no small part, because of generous financing that often does not reflect the targeted country's creditworthiness.
- ❖ These dual-use Chinese and Russian corporate entities can be employed both to provide services for civilian missions (e.g. supporting a civil space mission) as well as military activities (e.g. locating and tracking naval targets, signals intelligence, etc.)
- ❖ The pattern of Chinese and Russian space-related transactions reveals a global approach, signaling that both countries are determined to expand their space stature and competitiveness, and close the gap with Europe and the U.S. (e.g. existing and planned GLONASS and Beidou ground stations, Russian or Chinese observatories abroad such as Pico dos Dias or the planned Chinese-Chilean observatory, etc.)
- ❖ A second pattern (where space considerations are not the prime mover) most often occurred in less economically significant, but resource-rich, countries (e.g. Bolivia, Nigeria, Venezuela, etc.), or countries that are geographically and/or geopolitically strategic for China or Russia (e.g. Pakistan for China, Iran for Russia, and Cuba for both countries). In the case of China, some of these recipient countries (e.g. Belarus, Cambodia, Laos, and Pakistan) are valued clients of its Belt and Road Initiative (BRI), without a direct linkage to space.
- ❖ In some cases, the two patterns of behavior described above are co-mingled, such as the case of the Arctic countries (e.g. Greenland).
- ❖ In addition to these vertically-integrated space partnership packages, some targeted countries also receive financial backing well beyond the space sector. For example, Bolivia signed a cooperation agreement under BRI, whereby China agreed to construct and finance transport and telecommunications infrastructure<sup>12</sup>. It is also a recipient of loans from China's Export-Import bank and the China Development Bank. Bolivia possesses one of the world's largest – and more accessible – reserves of lithium (which China covets).

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<sup>12</sup>As of December 2018, 15 countries from the Latin America and Caribbean (LAC) region have signed BRI-related MOUs. Most of them are smaller countries in Central American and the Caribbean, or the so-called "New Left", including Bolivia, Ecuador and Venezuela. (Source: China's Belt and Road Initiative in Latin America and the Caribbean, (Dec 2018), Vol. 24/40, IISS, available at: <https://www.iiss.org/publications/strategic-comments/2018/chinas-bri-in-latin-america>)

### III. Implications and Recommendations

Tracking and visually mapping the international transactions of state-owned or -controlled enterprises (SOEs) in the space sectors of various countries confirmed that China and Russia engage in offers of assistance to the nascent space programs of targeted countries which are, in many cases, creating dependencies consistent with the space sector capture concept. They also revealed that the stated purpose of such assistance is often at odds with the on-the-ground activities. The underlying strategic objective of global space power projection (often with associated economic benefits) has been evident in most cases.

Today, the implications of the active pursuit of international space partnerships globally by China and Russia to increase their influence over the space domain through such means as the offer of vertically-integrated ‘package deals’ of capabilities and services are not well-understood. The economic and financial incentives provided by these state actors to accomplish space sector capture, including subsidized financing at below-market terms, are often welcomed by the recipient countries which lack their own space funding, technical expertise and human resources, even if it exposes them to partial or complete dependency on these outside “benefactors”.

As economic and financial (E&F) space hybrid operations have the potential to shape applicable rules, norms and standards for access to, and operations in, space, Western governments would be well-advised to understand, and carefully monitor, this new risk category. Indeed, a preemptive and preventive approach to this asymmetric threat to global space norms and standards stemming from Chinese and Russian E&F space hybrid operations is required.

A useful first step is to understand the scale and underlying rationales for these activities so that relevant decision-makers, government agencies and allied commercial space companies can be brought up to speed on this new, fast-moving space security challenge. In addition, configuring more effective and attractive space partnership agreements will likely be required to counter these Chinese and Russian E&F predations under the guise of benign space partnerships.

It is clear that countries of all economic strata are intent on benefiting from the value provided by space. If upgraded space-related engagement and an enhanced level of support does not occur from Western countries, the void is likely to be filled – as we are already witnessing – from these other non-democratic actors, with potentially “high-risk” consequences.

As in other domains, a sustainable model of international partnerships cannot be established without transparency, disclosure, accountability, respect for national sovereignty and the rule of law. Western nations will likely need to consider various options for offering more robust space partnerships in a manner that both preserves the space sector “independence” of the recipient countries and is affordable. Fortunately, a clear distinction can be between countries that respect free and fair market principles and state-led economies that often show little regard for such principles.

Accordingly, in an effort to promote a competitive commercial space environment based on transparency, good governance and disclosure and push back against the authoritarian model of space partnerships, the following recommendations are put forward for consideration by Western space agencies and security communities:

- ★ European and other allied governments would be well-advised to recognize rather urgently that China and Russia are accumulating a sizeable number of international space partnerships annually, which is providing them with growing leverage in multilateral settings to shape space behavioral norms in a manner often inconsistent with Western interests;
- ★ Western governments would be wise to monitor more carefully Chinese and Russian economic and financial activities in the space domain globally and seek opportunities to push back against often one-sided partnering arrangements that will ultimately disadvantage the targeted countries and cede important territories and markets (including certain ground segments of space operations) to Beijing and Moscow;

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- \* Efforts should be made to integrate the predatory economic and financial (E&F) space activities of China and Russia globally into the space-related common operating picture of allied space agencies and militaries;
- \* Individual Western governments should reexamine the nature and substance of their present space partnering agreements to determine if they are competitive with those offered by authoritarian governments influenced by strategic considerations to a far greater extent than their Western counterparts;
- \* Western commercial space companies should likewise be alert to the space sector capture activities of China and Russia as they tend to lead to sole-source supplier relationships, thereby depriving such allied companies of potentially important business opportunities and new markets; and
- \* Conduct or commission further in-depth studies concerning the specific rationales underpinning the country selection processes of China and Russia and how they are prosecuting space sector capture objectives, with a view toward configuring effective and flexible countermeasures.



