

# Does the Middle Kingdom rise up alone?

The US exclusionist policy toward China's space program



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Figure 1: “Nation's image reflects its growing power”, with the *Tiangong-1* space station prominently featured.<sup>1</sup>

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<sup>1</sup> Sui Yu, ‘Nation’s Image Reflects Its Growing Power’, *China Daily*, 19 April 2018, <http://www.chinadaily.com.cn/a/201804/19/WS5ad7d674a3105cdcf651922a.html>.

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(Subtitles of the main chapters are quoted lines from the poem 'Reascending Ching kangshan', written by Mao Zedong in May 1935.<sup>2</sup>)

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<sup>2</sup> 'Reascending Ching kangshan', 2007, <https://www.marxists.org/reference/archive/mao/selected-works/poems/poems35.htm>.

## ABSTRACT

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Aside from a short period in the 1950s, China has been developing its space program indigenously up to the 1980s. Largely managed by the PLA, the expensive program required justification on the grounds of prestige and military benefits. With the normalisation of Sino-US relations in 1979, science and technology cooperation as well as commercial engagement with the US on space became an option for China. Under Deng's leadership in the 1980s, the economic rationale for the space program gained in importance and satellite launch agreements were signed. Meanwhile, the prestige generated by the accomplishments in space continued to be used as demonstration of the CCPs economic success. In 1989, US international outrage at the Tiananmen square incident caused economic sanctions that also hit the Chinese space sector. The real blow to Sino-US engagement in space came in 1999 with the publication of the Cox report on US export policy regarding China. This report greatly exaggerated flaws in the policy and the threat China posed at the time. Afterwards, an era in which China threat theory dictated Congress' decision-making on China and space took off. By tying human rights and democratisation to the issue of space cooperation, a handful of US Congressmen have been able to stifle Sino-US space engagement. These policies combine to form the US exclusionist policy towards the Chinese space program, which is fragmented, not based on strategy and of limited effectiveness. How damaging this will be to US leadership in space is still to be seen.

## INTRODUCTION

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*“BEIJING, Jan. 22 (Xinhua) -- China plans to launch the Chang'e-5 lunar probe at the end of November this year, from the Wenchang Space Launch Center in southern China's Hainan Province, aboard the heavy-lift carrier rocket Long March-5. The mission will be China's first automated moon surface sampling, first moon take-off, first unmanned docking in a lunar orbit about 380,000 km from earth, and first return flight in a speed close to second cosmic velocity, according to the China Aerospace Science and Technology Corporation (CASC).”*

Xinhua, the Chinese state news agency, commenting in 2017 on the planning of the first Chinese lunar sample return mission. Chang'e-5 represents the zenith of Chinese lunar exploration, that started with the Chang'e-1 lunar orbiter in 2007.<sup>3</sup>

Over 40 years ago the latest soil samples from the moon were returned to the earth, by the Soviet Luna 24 spacecraft. This supreme feat of technological prowess was planned to be repeated this year, by a developing nation nonetheless. As stated above by the official Chinese state press agency Xinhua, the Chinese Chang'e-5 is a mission of space 'firsts' for China. All of these accomplishments had already been achieved in the late 1960s by the USSR and US space programs. Still, they are significant achievements for the Chinese space program and put it in the top-tier of spacefaring states. The later Chang'e-4 moon mission will even be China's first major 'first' in space. Once it the mission is completed, China will be the only state in the world that has softly landed a spacecraft on the far side of the moon and returned it to earth. By the time the International Space Station (ISS) retires in 2025 (or possibly later), the Chinese 'Tiangong' ('heavenly palace') will even be the only space station in orbit.<sup>4</sup> These 'firsts' are indicative of the large progress China has made in the field of space technology. On the other hand, the July 2017 launch failure of the new Long March 5 rocket has set the scheduled launch date of the Chang'e-5 back.<sup>5</sup> So while China is progressing significantly in cutting edge space technology and now on par with advanced space states like the US and Russia, its space program still suffers from the occasional heavy set-back.

While China is continuing the development of its space programs decades after the original space race, the US seems less than enthusiastic. The US had previously used its space program to engage with opponents, as was the case with the 1975 Apollo–Soyuz Test Project where a US and a USSR spacecraft docked. Cooperation in space was seen as an important and public part of

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<sup>3</sup> Xuequan Mu, 'China Schedules Chang'e-5 Lunar Probe Launch', *Xinhua*, 22 January 2017, [http://www.xinhuanet.com/english/2017-01/22/c\\_136004958.htm](http://www.xinhuanet.com/english/2017-01/22/c_136004958.htm).

<sup>4</sup> Huaxia, 'Tiangong-2 Takes China One Step Closer to Space Station', *Xinhua*, 16 September 2016, [http://www.xinhuanet.com/english/2016-09/16/c\\_135689907.htm](http://www.xinhuanet.com/english/2016-09/16/c_135689907.htm); John Holdren P. and Charles Bolden, 'Obama Administration Extends International Space Station until at Least 2024', 8 January 2014, <https://obamawhitehouse.archives.gov/blog/2014/01/08/obama-administration-extends-international-space-station-until-least-2024>.

<sup>5</sup> Andrew Jones, 'China Is Planning a New Long March 5 Rocket Launch Following July Failure', *GBtimes*, 11 February 2017, <https://gbtimes.com/china-is-planning-a-new-long-march-5-rocket-launch-following-july-failure>.

détente in that time.<sup>6</sup> After the fall of the Soviet Union in 1991, the Russian Federation was even readily included in the ISS project. NASA now has extensive cooperation with all major space agencies: Russia's Roscosmos, the European Space Agency (ESA) and Japan Aerospace Exploration Agency (JAXA).

The China National Space Administration (CNSA) is conspicuously missing from the list of national space agencies the US cooperates with. Historically, a different dynamic has evolved between the US and China compared to that of the US with the USSR/Russia or other states. Currently, and since the inception of the Chinese space program, the US is refusing cooperation in any part of their space program. While in the late 1980s and early 1990s commercial interaction has been allowed by the US, exclusion of China in international US-led cooperation has increased due to several affairs and a changing perception of China. Most notably, China was excluded from the ISS, one of the most important space achievements and one that is fundamentally international. A prohibition of almost all cooperation on space technology has been included in US domestic legislature as well. Both the National Aeronautics and Space Administration (NASA) and the White House's Office of Science and Technology Policy (OSTP) are barred from any cooperation, while commercial entities are restricted by comprehensive arms export regulations like the International Traffic in Arms Regulations (ITAR).

Preventing US space cooperation with China is part of a strategic policy by successive US administrations until the Obama Administration. This 'exclusionist' policy was mostly motivated in terms of protecting US national security. While classic concerns of missile proficiency and force enhancement are encompassed in this motivation, the US also expressed other concerns. In the Departments of Defense and State 'Risk assessment of the United States Space Export Control Policy' of 2012, these concerns are stated as follows:

*"Operational space capabilities are a source of Chinese national pride as well as a new international engagement leverage point that may run counter to U.S. national security objectives."*<sup>7</sup>

Meanwhile, much of the restrictive policy has come from Congress instead of the US Administrations. This has prompted some scholars to designate Sino-US space relations as a 'balancing act between the US Congress and the president'.<sup>8</sup>

Space programs have historically proven to be a suitable tool for improving great power relations, and the US cooperates with all major space agencies except the Chinese. Politics has been called the 'first dimension of space' and long-term political elite support through a combination of interests and political rationales is needed to achieve a functioning space

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<sup>6</sup> Bruce Murray and Merton E. Davies, 'Détente in Space', *Science, New Series* 192, no. 4244 (1976): 1067–74; J. Ross-Nazzari, 'Detente on Earth and in Space: The Apollo-Soyuz Test Project', *OAH Magazine of History* 24, no. 3 (1 July 2010): 29–34, <https://doi.org/10.2307/maghis/24.3.29>.

<sup>7</sup> 'Risk Assessment of US Space Export Control Policy', Report to Congress (Departments of Defense and State, 15 March 2012).

<sup>8</sup> Vidya Sagar Reddy, 'U.S.-China Space Cooperation: Balancing Act between the U.S. Congress and President', *Astropolitics* 15, no. 3 (2 September 2017): 235–50, <https://doi.org/10.1080/14777622.2017.1378962>.

program.<sup>9</sup> Domestic as well as international prestige have been named as motivating factors, although there is widespread disagreement about the relative influence of these and other rationales for the Chinese space program.<sup>10</sup>

In chapter 1, this thesis takes into account military, civil and prestige factors will be used to characterise China's space program, its development and the way it is presented to the international community by the Chinese government. This grounded and comprehensive approach provides a framework for the consideration of policy on international space cooperation with China. But why does the US exclude China from cooperation on space? Chapter 2 will address this question by looking at the development of the US exclusionist policy on commercial and civil cooperation over time, its drivers and its intended effects. Combining the politics of space stations and comparing past and present Chinese international space cooperation provides an overview of the Chinese response and its repercussions in chapter 3, including the strategic consequences of the exclusionist policy.

Together, this will allow the answering of the main research question: What are the origin and consequences of the US exclusionist policy towards China regarding space technology and cooperation?

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<sup>9</sup> Alton Frye, 'Politics—the First Dimension of Space', *Journal of Conflict Resolution* 10, no. 1 (March 1966): 103–12, <https://doi.org/10.1177/002200276601000109>.

<sup>10</sup> Michael Sheehan, "Did You See That, Grandpa Mao?" The Prestige and Propaganda Rationales of the Chinese Space Program', *Space Policy* 29, no. 2 (May 2013): 107–12, <https://doi.org/10.1016/j.spacepol.2013.03.003>.

## CHAPTER 1

### Rationales for the Chinese Space Program

#### “I have Long Aspired to Reach for the Clouds”

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Developing a state of the art space program is an enormously costly endeavour for any state. Nowadays the NASA budget is 0,47% of US federal spending (over fiscal year 2017).<sup>11</sup> However, this was as high as 4,41% (1966) of US federal spending during the apogee of the space race against the USSR.<sup>12</sup> Data for the Chinese space program is and has been hard to establish, as the program is shrouded in secrecy.<sup>13</sup> As with all state expenditure, there must be good reasons for why this policy of space technology development is pursued. The rationales are even more pertinent for a space program, as it has heavy costs up front, needs long term political commitment and only promises uncertain returns on investment.

The salience of these rationales increases when they are combined with the fairly stretched budget of a developing state. China has had to choose between demands for investment in the economy, social wellbeing, the space program and many others. Even though an authoritarian government is less beholden to the swings of public opinion, prioritizing rockets over food security does place pressure on the legitimacy of the government. Still, China had sustained the program from its inception in 1956 onwards, even though the space program at times suffered from expenditure competition and other factors that will be discussed in chapter 2. When proposing project 863, China's Aerospace Ministry also noted the necessity of political rationales and support, stating:

*“Whether or not we go ahead with a human spaceflight program is a political policy, not a purely technical question, not something scientific and technical people can decide by themselves.”*<sup>14</sup>

#### 1. SPACE PROGRAM RATIONALES

The reasons or rationales for states to embark on and sustain a risky and expensive space program are similar and fall into a few categories. In one of the first thorough and structured considerations of the rationales and activities of space programs, Roger Handberg in 2002 defined four categories: military, scientific, civil and commercial.<sup>15</sup> Although he explicitly notes that these

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<sup>11</sup> Jeff Foust, ‘NASA Receives More than \$19.6 Billion in 2017 Omnibus Spending Bill’, *Spacenews*, 1 May 2017, <http://spacenews.com/nasa-receives-more-than-19-6-billion-in-2017-omnibus-spending-bill/>.

<sup>12</sup> ‘Nasa Budgets: US Spending on Space Travel since 1958’, *The Guardian, Datablog* (blog), 2016, <https://www.theguardian.com/news/datablog/2010/feb/01/nasa-budgets-us-spending-space-travel>.

<sup>13</sup> Zack Hester, ‘China and NASA: The Challenges to Collaboration with a Rising Space Power’, *Journal of Science Policy & Governance* 9, no. 1 (September 2016), [http://www.sciencepolicyjournal.org/uploads/5/4/3/4/5434385/jspg\\_article\\_c\\_2016\\_summer.pdf](http://www.sciencepolicyjournal.org/uploads/5/4/3/4/5434385/jspg_article_c_2016_summer.pdf).

<sup>14</sup> Gregory Kulacki and Jeffrey G Lewis, *A Place for One's Mat: China's Space Program, 1956-2003* (American Academy of Arts and Sciences, 2009), 25.

<sup>15</sup> Eligar Sadeh, *Space Politics and Policy an Evolutionary Perspective* (Dordrecht: Kluwer Academic Publishers, 2006), 33, <http://accessbib.uqam.ca/cgi-bin/bduqam/transit.pl?&noMan=25127791>.

are the rationales and activities of the US space program, they can be used for analysis of other states' space policy as well. The different activities within the US space program of past, present and future are categorised by him as being driven by the four specific rationales, as seen in Table 1.

In their 2007 study 'Chinese Space Policy', Roger Handberg and Li place the development of China's space program in a detailed national and international political context.<sup>16</sup> Handberg's four categories are used to characterise the main rationales for different national space programs (with 'civil' changed into 'human spaceflight' compared to the 2002 chapter). In doing so, an international context is constructed in which the changes of orientation within the Chinese space program are placed. These changes are then attributed to domestic politics such as leadership changes, or international developments, such as the cessation of Soviet technical assistance. While comprehensive in time-scale, the Handberg & Li study does not elaborately address international reactions to developments in the Chinese space program and their consequences for the program.

Using Handberg's categories is informative when considering specific space activities (as was the case in the 2002 chapter), but they fall short when the attempt is to make a comprehensive framework for understanding space policy rationales for all states. Especially when also considering the influence of changes in domestic politics, rationales for the similar activities can change over time. Additionally, as Handberg & Li themselves mention several times, gaining international prestige is an important concern for space faring states.<sup>17</sup> While this was strongly connected to the military rationale during the space race, it emerged as an independent driving force afterwards. Still, it is a rationale that is often functioning in conjunction with other rationales. Even if it does not directly inform the type of space activity, considerations of prestige often emerge in the explanations given for the pursuance of a (larger) national space program, making it an important category in the analysis of state's rationales.

At the same time, the activities falling under the civil and scientific space activity categories are often similar. In the 2002 framework of Handberg, scientific activities comprise all space-related science, with the exception of that conducted by humans in space, which is put in the category of civil activities. Again there is a difference between the category of activity and the rationale; for scientific space programs there is a separate rationale involving the benefits of the acquisition of knowledge and its applications. While human spaceflight also involves scientific projects, its major rationale is prestige.<sup>18</sup> Therefore, the activity of human spaceflight needs to be considered as the outcome of a merger between the prestige and scientific or civil rationale, instead of as its own separate rationale. Motivations for engaging in space science projects will thus be considered as the civil rationale.

This leaves us with four distinct rationales for national space policy: military, civil, commercial and prestige. These rationales inform the decision-making process in all states with a space program. A short overview of the categories with specific attention to the US and China will follow. The characterised rationales can be used in explaining why the US excluded and still excludes China from cooperation in space.

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<sup>16</sup> Roger Handberg and Zhen Li, *Chinese Space Policy: A Study in Domestic and International Politics* (Routledge, 2012).

<sup>17</sup> Handberg and Li, 5, 16, 18, 27, 65.

<sup>18</sup> Fiona Cunningham, 'The Stellar Status Symbol: True Motives for China's Manned Space Program', *China Security* 5, no. 3 (2009): 73–88.

Table 1: *Handberg's 2002 categorisation of space program rationales and associated space policies, progressing over time.*<sup>19</sup>

<b>Time Line:</b>	<b>Beginnings</b>	<b>Present</b>	<b>Future</b>
<b>Activity:</b>			
<b>Military</b>	Military Space	Force Support Force Enhancement	Space Control Force Application
<b>Scientific</b>	Space Science	Earth Science Astronomy	Planets Asteroids Environment
<b>Civil</b>	Human Spaceflight	Space Shuttle Space Station	Human Habitation Human Exploration
<b>Commercial</b>	Technology Development	Commercial Applications	Economic Competitiveness

## 2. MILITARY

The origins of space programs were clearly motivated by military considerations, leading to the military rationale being called the 'prime mover'.<sup>20</sup> With the emergence of the Cold War, nuclear forces became the crucial strategic interest of the two superpowers, US and USSR. Improvements in ballistic missile technology led to the emergence of nuclear tipped missiles with increasing ranges. Strategic value, degree of threat and feasibility of retaliation increased with longer range and heavier payload capabilities. This priority of rocket development for military use translated directly into increasing technical knowledge needed for the space programs.<sup>21</sup>

Three main drivers of the military rationale, with different impact over time, can be distinguished: space as a nuclear proxy, military satellites and anti-satellite (ASAT) technology. Firstly, 'exploring space' became an acceptable façade for exclusively military missile tests. It gave the US and USSR the excuse of pursuing peaceful progress, while continuing their race to develop better nuclear missiles. The increases in range and carrying weight of the rockets were demonstrated by scientific payloads, but the implication that these could be exchanged for nuclear warheads was all too clear. Manned spaceflight also proved mastery of numerous advanced technologies, as the safekeeping of the astronauts and cosmonauts required a plethora of protective systems and even higher guarantees of success.

Secondly, improvements in surveillance and communications technology allowed for the use of satellites in military operations. Their role is one of a 'force enhancer' or 'force multiplier', technology that improves the value, strength and/or precision of other military units.<sup>22</sup> Early military satellites in the 1960's and 1970's were mostly used to provide photographs of the

<sup>19</sup> Sadeh, *Space Politics and Policy an Evolutionary Perspective*, 33.

<sup>20</sup> Sadeh, 34.

<sup>21</sup> Handberg and Li, *Chinese Space Policy: A Study in Domestic and International Politics*, 11, 27.

<sup>22</sup> Jeffrey Caton L., 'Joint Warfare and Military Dependence on Space', JFQ Forum (Institute for National Strategic Studies, 1996).

opponent's military installations and troop deployments.<sup>23</sup> Meteorological satellites were also deployed from the mid 1960's onwards to provide detailed data on the weather, a factor crucial to military operations.<sup>24</sup> Military satellites are also used to relay communications and provide real-time targeting information to military systems. The importance and success of the use of military satellites in an integrated manner was exemplified by the role they played in the US invasion of Iraq during the First Gulf War.<sup>25</sup> China has already moved its military space activities from the General Armaments Department (GAD) to the new and more dedicated Strategic Support Force (SSF) in 2015, a clear indication of the importance the Chinese People's Liberation Army (PLA) attaches to space.<sup>26</sup>

Thirdly, improvements in space technology have become driven by a strategic desire to control the space domain using ASAT technology. Precisely because of the increasing military value of space due to intercontinental ballistic missiles (ICBMs) and military satellites, countering these capabilities has become an area of interest for several armed forces. Especially if the opponent's military communication satellites (COMSATs) are integrated in the command structure, and relied upon for reconnaissance and targeting, taking them out provides a strong advantage. Therefore, the US, China, Russia and possibly others are developing ASAT weapon systems that are able to blind, 'dazzle' or destroy enemy satellites.<sup>27</sup>

All the national security implications of the 'prime mover' of national space programs make cooperation on space a loaded issue. It is estimated that over 90% of all space technology is inherently dual-use; that is to say, it can be used both for civil and military goals. Sharing space knowledge therefore becomes sharing military knowledge, something which is not even routine amongst allies. In 1956 the Chinese did acquire an R-1 rocket from the Soviets, and later a more advanced R-2.<sup>28</sup> However, the R-1 gave the Chinese little new knowledge as it was simply a copy of the old V-2 rocket developed by the Germans in the early 40's. Even the R-2, while more advanced, was still far from the cutting-edge of Soviet technology at the time.<sup>29</sup> Reluctance to share space technology out of security concerns was inherent from the beginning of its development, even amongst allies. This dual-use complication causes all close space cooperation to this day, even that on clearly scientific missions, to be subject to intense national security driven scrutiny.

While dual-use issues are inherent to all space programs, the Chinese program exhibits them to a higher than average degree. Similar to the US and Soviet programs, it started out as an

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<sup>23</sup> 'Military Satellite Systems: A History — Part One', *MilsatMagazine*, May 2008.

<sup>24</sup> 'Defense Meteorological Satellite Program', National Oceanic and Atmospheric Administration, Office of Satellite and Product Operations, 13 June 2018, <https://www.ospo.noaa.gov/Operations/DMSOP/index.html>.

<sup>25</sup> Larry Wortzel, 'The Chinese People's Liberation Army and Space Warfare', *Astropolitics* 6, no. 2 (May 2008): 114, <https://doi.org/10.1080/14777620802092285>.

<sup>26</sup> Kevin Pollpeter, Michael Chase, and Eric Heginbotham, *The Creation of the PLA Strategic Support Force and Its Implications for Chinese Military Space Operations* (Santa Monica: RAND Corporation, 2017), <https://doi.org/10.7249/RR2058>.

<sup>27</sup> Laura Grego, 'A History of Anti-Satellite Programs' (Union of Concerned Scientists, January 2012), [https://www.ucsusa.org/sites/default/files/legacy/assets/documents/nwgs/a-history-of-ASAT-programs\\_lo-res.pdf](https://www.ucsusa.org/sites/default/files/legacy/assets/documents/nwgs/a-history-of-ASAT-programs_lo-res.pdf); Ashley J. Tellis, 'China's Military Space Strategy', *Survival* 49, no. 3 (October 2007): 41–72, <https://doi.org/10.1080/00396330701564752>.

<sup>28</sup> Handberg and Li, *Chinese Space Policy: A Study in Domestic and International Politics*, 60.

<sup>29</sup> Handberg and Li, 60.

exclusively military program with the establishment of the Fifth Academy under the Ministry of National Defence.<sup>30</sup> On Mao Zedong's orders, it was tasked with the 'two bombs and one satellite' goal. This referred to the atomic bomb, hydrogen bomb and earth orbiting satellite, which were achieved in 1964, 1967 and 1970 respectively.<sup>31</sup> In 1965 the Fifth Academy was converted into the Seventh Ministry of Machinery Industry, a civilian government entity. However, this caused the space program to be highly vulnerable to targeting by the Red Guards during the Cultural Revolution (1966-1976). The PLA's Military Control Committee was sent in 1967 to bring the ministry back under the auspices of Lin Biao, a staunch ally of Mao at the time. Because of this, the damage inflicted on the space program was less than the damage other research and educational institutes suffered.<sup>32</sup> After the 1988 merger with the Ministry of the Aviation Industry it became the Ministry of Aviation and Space Industry. Only in 1993 did it split into CNSA and its 1999 assembly branch, the China Aerospace Science and Technology Corporation (CASC).<sup>33</sup> Throughout the reorganisations, the PLA has been able to exert much direct influence on the space program.<sup>34</sup> Crucially, CASC is still subordinate to the General Armaments Department of the PLA.<sup>35</sup> A salient reminder of the level of control and autonomy of the PLA regarding space activities came after the 2007 ASAT test. Chinese diplomats and even the foreign minister himself were apparently not informed about the PLA's test, and at a loss when asked for explanation by US officials.<sup>36</sup> The possibility of this unawareness of the Chinese foreign ministry was also considered feasible by Chinese scholars, who noted that the PLA and Ministry of Foreign Affairs (MFA) have separate lines of communication to the State Council and no direct contact.<sup>37</sup> In 'Chapter 78: Integrate Military and Civilian Development' of 'The 13<sup>th</sup> five-year plan for the economic and social development of the People's Republic of China. 2016-2020', the issue of dual-use is addressed as in the following way:

*"We will implement integrated military-civilian development projects, including ocean, space, and cyberspace projects and measures, the development of innovation demonstration zones for military-civilian integration, and the strengthening of coordination between the military and*

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<sup>30</sup> Handberg and Li, 67.

<sup>31</sup> James Lewis A., 'China in Space: Carrying Forward the Spirit of Two Bombs and One Satellite', University of Nottingham's Asia Research Institute, *Space* (blog), 22 October 2014, <http://theasiadialogue.com/2014/10/22/china-in-space-carrying-forward-the-spirit-of-two-bombs-and-one-satellite/>.

<sup>32</sup> Handberg and Li, *Chinese Space Policy: A Study in Domestic and International Politics*, 73.

<sup>33</sup> 'History of CASC', China Aerospace Science and Technology Corporation, accessed 30 June 2018, <http://english.spacechina.com/n16421/n17138/n382513/c386575/content.html>.

<sup>34</sup> Kulacki and Lewis, *A Place for One's Mat: China's Space Program, 1956-2003*, 13, 29.

<sup>35</sup> Mark Stokes A. and Dean Cheng, 'China's Evolving Space Capabilities: Implications for U.S. Interests', Research report, Prepared for the U.S.-China Economic and Security Review Commission (Project 2049 institute, 26 April 2012).

<sup>36</sup> Tellis, 'China's Military Space Strategy'; Bates Gill and Martin Kleiber, 'China's Space Odyssey: What the Antisatellite Test Reveals about Decision-Making in Beijing', *Foreign Affairs* 86, no. 3 (2007): 2-6.

<sup>37</sup> Eligar Sadeh, 'Report: United States-China Space Dialogue Project', *Astropolitics* 8, no. 1 (January 2010): 7-18, <https://doi.org/10.1080/14777622.2010.494513>.

*civilian sectors in the sharing of advanced technologies, industries, products, and infrastructure.”*

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The high level of PLA involvement combined with the open and wilful integration of civil and military projects on space increases the weariness of other states to engage in space cooperation with China.

### 3. CIVIL

The civil rationale for space programs, which has evolved from a peaceful cover for military development into an independent rationale, encompasses scientific, human spaceflight and domestic use drivers. The first and clearest manifestation of the civil rationale is in scientific missions. While Sputnik provided scientists with valuable data on the Earth's atmosphere and outer space, it was not launched for scientific reasons. Later, instruments such as the Hubble Space Telescope (launched in 1990) are clear missions with a scientific rationale. On the one hand, after a certain improved rocket has been successfully launched a number of times, its value as a showcase of increased military capability diminishes. On the other hand, governments started realising that scientific advances -including those of fundamental science- can lead to great economic benefits. As will be discussed later, scientific advances in themselves are also a matter of prestige and military capability through dual use. This makes it harder to disentangle what the actual rationale behind a specific science-oriented mission was.

For China, space science was at first completely subordinate to the military rationale. Science as a rationale for the space program was eventually introduced by Deng Xiaoping. In 1988 during a conversation with President Gustav Husak of Czechoslovakia, Deng remarked:

*“Marx said that science and technology are part of the productive forces. Facts show that he was right. In my opinion, science and technology are a primary productive force. For us, the basic task is to maintain socialist convictions and principles, expand the productive forces and raise the people's living standards.”*<sup>39</sup>

Here, Deng ties the advancement of science and technology to the goal of economic development, effectively combining the civil and economic rationale. In a statement a few days later, Deng even stated what the higher priority should be: *“We should try every way to expand education, even if it means slowing down in other fields.”* This tied in with his assessment that China *“already wasted 20 years when we should have been developing”* and the damage the Cultural Revolution had done to the intellectual climate in the country.<sup>40</sup>

The second driver of the civil rationale is human spaceflight, which is also strongly connected to notions of international prestige. With the orbit of taikonaut Yang Liwei in 2003,

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<sup>38</sup> ‘The 13th Five-Year Plan for Economic and Social Development of the People’s Republic of China (2016–2020)’ (Central Compilation & Translation Press, December 2016),

<http://en.ndrc.gov.cn/policyrelease/201612/P020161207645766966662.pdf>.

<sup>39</sup> Xiaoping Deng, ‘Science and Technology Constitute a Primary Productive Force. September 5 and September 12, 1988’ (People’s Daily), accessed 25 April 2018, [en.people.cn/dengxp/vol3/text/c1900.html](http://en.people.cn/dengxp/vol3/text/c1900.html).

<sup>40</sup> Deng.

China became the third state ever to achieve human spaceflight, making it part of a very select and prestigious group of states. It is important to note however, that similar to repeated launches of the same rocket type, flying humans to space has diminishing prestige returns. Sending the first taikonaut into outer space is a remarkable event reported around the world, sending up taikonaut number twenty-five less so. The truly civil rationale of human spaceflight is what the US National Research Council (NRC) calls an ‘aspirational rationale’, as opposed to the ‘pragmatic rationales’. These rationales include “*contributions to the eventual survival of our species and to supporting the human destiny to explore and aspire to challenging goals*”.<sup>41</sup> In its expansive 2014 report on the ‘Rationales and Approaches for a U.S. Program of Human Space Exploration’, the NRC also notes the boost the program gives to science, and the role it plays in encouraging students to pursue science degrees. Assessing the ‘human destiny and aspiring rationales’, the NRC conclusion is as follows:

*“The urge to explore and to reach challenging goals is a common human characteristic. Space is today a major physical frontier for such exploration and aspiration. Some say that it is human destiny to continue to explore space. While not all share this view, for those who do it is an important reason to engage in human spaceflight.”*<sup>42</sup>

For the Chinese the civil or aspirational rationales also have their place in the motivation for pursuing a space program. As Xi Jinping remarked in 2013 before the take-off of Shenzhou 10 (China’s fifth manned space mission): “*The mission’s crew members carry the space dream of the Chinese nation and represent the lofty aspirations of the Chinese people to explore space*”.<sup>43</sup> China has also ratified the 1967 Outer Space Treaty along with all notable spacefaring states, declaring that space “*shall be the province of all mankind*”.<sup>44</sup>

Finally, space programs are able to confer unique national civil benefits, mostly through satellite use. Weather satellites do not just improve local weather predictions for civilians, but also predict tornadoes, earthquakes, droughts and monitor forest fires. A state with its own weather satellites is thus able to save harvests as well as lives. COMSATs connect remote and underdeveloped areas with the outside world, a crucial task in an enormous and often rugged territory as China’s. These new lines of communication were used to connect distant provinces with the government in Beijing, and to provide ‘distance learning’ to areas with underdeveloped education facilities.<sup>45</sup> Again, these applications show that the civil rationale is always intertwined with other rationales. Enhancing government communication is linked to domestic prestige, enhanced education to economic benefits, and disaster prevention or relieve to both. Therefore, the use of these civil satellites for weather prediction and communications stems from a conjunction of several rationales.

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<sup>41</sup> ‘Why Do We Go There?’, in *Pathways to Exploration. Rationales and Approaches for a U.S. Program of Human Space Exploration*, by National Research Council (Washington, D.C.: The National Academies Press, 2014), 48, <https://www.nap.edu/read/18801/chapter/1#ii>.

<sup>42</sup> ‘Pathways to Exploration’, 69–70.

<sup>43</sup> Shaohui Tian, ‘Backgrounder; Xi Jinping’s Vision for China’s Space Development’, *Xinhua*, 24 April 2017, [http://www.xinhuanet.com/english/2017-04/24/c\\_136232642.htm](http://www.xinhuanet.com/english/2017-04/24/c_136232642.htm).

<sup>44</sup> *United Nations Treaties and Principles on Outer Space*, Revised edition (United Nations Publication, 2003), <http://www.unoosa.org/pdf/publications/STSPACE11E.pdf>.

<sup>45</sup> Handberg and Li, *Chinese Space Policy: A Study in Domestic and International Politics*, 93–94.

#### 4. ECONOMIC

Venturing into space places an enormous economic burden on any state, yet there is also money to be made for the developed space technology. Pursuing these economic benefits might not make the program entirely profitable, but at least refunds some of the investment that has been made. The power of the economic rationale is very limited in the establishment of a space program. As discussed earlier, military considerations were the 'prime mover' for space programs. Possible benefits were far down the line, past enormous investment, unforeseeable obstacles and potential failure. However, for an established space program with enough political support, large economic benefits can accrue. These come in various ways, depending on the development of the space program. In order of advancement they are: ballistic missile sales, launch services, satellite use, satellite sales and potentially, space station access.

Ballistic missiles have a high value for national security, making states willing to pay large sums to acquire them. While independent development is an option, it is much harder and expensive than simply buying a ballistic missile for direct use or reverse engineering. Characteristic of this driver for the economic rationale is that before the early 1980's, China opposed arms control regimes. It was willing to defy international pressure by arguing that it was just a way for the established powers to keep others down in terms of military technology.<sup>46</sup> In 1979 it even established an official company for selling missiles made by the Ministry of Space Industry called the 'China Precision Machinery Import-Export Corporation'. Saudi-Arabia bought Dongfeng 3 (or 'East wind 3') intermediate range ballistic missiles (IRBM's) from China in 1987-1988. Besides gaining an estimated US\$100 million per missile, the missile deal is also said to have substantially improved Sino-Saudi relations.<sup>47</sup> During the 1990's, China continued to sell missiles and missile technology to Pakistan including the short range ballistic missile (SRBM) DF-11. This has been judged to be not solely out of economic consideration, but also as a move against India.<sup>48</sup> Ballistic missile sales are a good source of hard currency for spacefaring states, although they have increasingly become scrutinised under missile proliferation treaties.

As a space program progresses, a state might decide to start offering launch services to commercial entities or other states. A crucial factor in this is the reliability of its launch vehicles, increasing the demand for openness about space launches. In 1985, China began using the Chang Zheng (CZ; 'Long March') rocket series to offer commercial launch services.<sup>49</sup> While initially successful, failures in 1995 and 1996 caused concern about the reliability of Chinese launchers. Due to these failures, decreased competitiveness and increased US trade restrictions (which will be discussed in Chapter 2), the amount of commercial launched by China decreased rapidly. Between 1991 and 1999, China carried out 17 commercial launches, out of 217 worldwide. In the same amount of time between 2000 and 2008, China carried out zero commercial launches, out of 197 worldwide. 2009 saw a new Chinese commercial launch, yet the total for 2009 to 2016 is still

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<sup>46</sup> Anastasia Angelova A., 'Compelling Compliance with International Regimes: China and the Missile Technology Control Regime', *Columbia Journal of Transnational Law* 38, no. 419 (1999): 441.

<sup>47</sup> Yitzhak Shichor, *East Wind over Arabia: Origins and Implications of the Sino-Saudi Missile Deal*, China Research Monograph 35 (Berkeley, Calif.: Institute of East Asian Studies, University of California, Berkeley, Center for Chinese Studies, 1989), 30-32.

<sup>48</sup> T.V. Paul, 'Chinese-Pakistani Nuclear/Missile Ties and Balance of Power Politics', *The Nonproliferation Review* 10, no. 2 (June 2003): 21-29, <https://doi.org/10.1080/10736700308436928>.

<sup>49</sup> Handberg and Li, *Chinese Space Policy: A Study in Domestic and International Politics*, 84-85.

only five (out of 172 worldwide).<sup>50</sup> While the commercial launch market has provided China with additional revenue in the past, it is just now slowly overcoming the painful failures of the late 1990's.

Once a state has become adept in designing, producing and launching satellites, it is able to rent out the services these satellites provide. Communication and science satellites can be leased out to other governments or commercial entities. In fact, before establishing its own COMSAT network, China relied on foreign satellite communication as early as 1972.<sup>51</sup> Nowadays, China has an extensive satellite fleet, with 204 orbiting the Earth as of September 2017. While more than Russia at 142, the US is still miles ahead with 803 satellites.<sup>52</sup> China has also been building up its BeiDou satellite navigation system, comparable to the US's GPS system.<sup>53</sup> With the first launch in 2000, the system currently provides regional coverage, with global coverage and accuracy higher than GPS expected to be achieved in 2020.<sup>54</sup> If successful, the Chinese BeiDou satellites will be able to provide better data and compete strongly with US services.

Less common option for monetisation of a space program are the sale of satellites or the selling of in-space services. China for example, has sold a complete satellite package to Bolivia in 2011. The China Great Wall Industry Corporation (CGWIC), the international trade branch of CASC, will produce, test and launch this satellite.<sup>55</sup> Certainly, these commercial space activities for non-spacefaring countries also have important effects on the bilateral relations. Maintaining a space station also gives control over who accesses it, and against what price. While the ISS is a cooperative project between 17 member states, the Chinese 'Tiangong' space station will be a purely Chinese effort. This allows the Chinese to sell access for astronauts and experiments to international partners. With no direct competition after the end of the ISS (likely in 2024), China will be able to determine its own price freely. Most likely to smoothen the transition, Chinese officials have ensured the space community that Tiangong technology will be compatible with that used aboard the ISS.<sup>56</sup> Again, in addition to clear gains in prestige, the Tiangong space station could become a valuable source of income.

Economic benefit has played a critical role in the Chinese space program. While the early development of the space program progressed, a change in leadership took place. Under Mao's 'two bombs and one satellite', progress on the missile and space program was clearly militarily oriented. After the short interim leadership of Hua Goufeng, Deng Xiaoping took over as paramount leader. His focus was economic development, his policies pragmatic. Seriously at odds with the drive for ideological purity during the Cultural Revolution preceding his ascent to

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<sup>50</sup> 'Worldwide Commercial Space Launches' (Bureau of Transportation Statistics), accessed 30 June 2018, <https://www.bts.gov/content/worldwide-commercial-space-launches>.

<sup>51</sup> Handberg and Li, *Chinese Space Policy: A Study in Domestic and International Politics*, 93.

<sup>52</sup> 'UCS Satellite Database', Union of Concerned Scientists, 7 November 2017, <https://www.ucsusa.org/nuclear-weapons/space-weapons/satellite-database#.WzgEDtIzbDd>.

<sup>53</sup> YuangXi Yang et al., 'Preliminary Assessment of the Navigation and Positioning Performance of BeiDou Regional Navigation Satellite System', *Science China Earth Sciences* 57, no. 1 (January 2014): 144–52, <https://doi.org/10.1007/s11430-013-4769-0>.

<sup>54</sup> Bianji Hongyu, 'China's Beidou Navigation System to Launch Mobile App in May', *People's Daily Online*, 11 April 2018, <http://en.people.cn/n3/2018/0411/c90000-9448134.html>.

<sup>55</sup> Laura M. Delgado-López, 'Sino-Latin American Space Cooperation: A Smart Move', *Space Policy* 28, no. 1 (February 2012): 7–14, <https://doi.org/10.1016/j.spacepol.2011.12.009>.

<sup>56</sup> Stokes and Cheng, 'China's Evolving Space Capabilities: Implications for U.S. Interests'.

paramount leader was his 'socialism with Chinese characteristics'. This phrase is strongly associated with the introduction of limited market forces into the Chinese state-controlled economy. After Deng, Jiang Zemin's theory of the 'three represents' contained a similar commercial/economic focus. One of the three ideals the CCP must represent is formulated as 'the requirements for developing China's advanced productive forces'. Hu Jintao in turn incorporated the 'scientific outlook on development' as a core practice for bringing about a 'harmonious society'. This focus on the economic development of China meant that the space program also had to adapt to a more supportive role. Deng quote on the prioritisation of the 'four modernisations' is telling:

*"When we have a good economic foundation will it be possible for us to modernize the army's equipment. [...] Economic development is the most important, and everything else must be subordinate to it."*<sup>57</sup>

## 5. PRESTIGE

A key rationale for states in pursuing a space program is prestige, both domestic and international. While it is often mentioned in various ways in the description of other rationales, the accrual of prestige is a rationale in and of itself. R.P. Dore in his 1975 consideration of the influence of prestige in international affairs identifies a 'normatively ranked hierarchy of nations'.<sup>58</sup> Prestige is that which determines the rank a state occupies within this hierarchy, i.e. its status. As it is normative, the hierarchy does not just encompass power. Equality, justice, social, artistic and intellectual development are part of this normative scheme that add up to possible claims of 'moral leadership'. A minimalist definition of prestige that has been offered is 'recognition of importance'.<sup>59</sup>

Prestige can be gained from two basic sources; material and social. A flourishing economy, extensive knowledge of advanced technology and a strong military are examples of the former. Powerful alliances and membership in international institutions (especially those promoting peace) are examples of the latter. Crucially, an additional distinction is made between dominance and higher prestige. While dominance is supported by force, prestige is 'freely conferred deference'.<sup>60</sup> The important consequence of this distinction is that those seeking higher prestige, do not necessarily seek dominance.<sup>61</sup>

For contemporary China, a rightfully prestigious position in the world has been missing during the 'century of humiliation' it suffered, since being defeated by Great Britain in the First Opium War of 1839-1842. A time of unequal treaties, domestic turmoil and foreign dominance followed, throwing China into chaos. For over two millennia before the colonial powers brought

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<sup>57</sup> Handberg and Li, *Chinese Space Policy: A Study in Domestic and International Politics*, 95.

<sup>58</sup> R. P. Dore, 'The Prestige Factor in International Affairs', *International Affairs* 51, no. 2 (April 1975): 190–207, <https://doi.org/10.2307/2617232>.

<sup>59</sup> Steve Wood, 'Prestige in World Politics: History, Theory, Expression', *International Politics* 50, no. 3 (May 2013): 387–411, <https://doi.org/10.1057/ip.2013.13>.

<sup>60</sup> Joseph Henrich and Francisco J Gil-White, 'The Evolution of Prestige: Freely Conferred Deference as a Mechanism for Enhancing the Benefits of Cultural Transmission', *Evolution and Human Behavior* 22, no. 3 (May 2001): 165–96, [https://doi.org/10.1016/S1090-5138\(00\)00071-4](https://doi.org/10.1016/S1090-5138(00)00071-4).

<sup>61</sup> Wood, 'Prestige in World Politics'.

imperial China to its knees, the Middle Kingdom had been the centre of its world. The Chinese, from the unification of China in 221 BCE, were used to receiving tribute from neighbouring tribes and states through the tributary system. Note that this was without the threat or use of force, and instead considered something self-evident. China saw its culture, philosophy and language as constituting the pinnacle of civilised society, to which others logically ‘freely conferred deference’. This tributary system was only ended forcefully when in the nineteenth century the Qing dynasty encountered the militarily vastly superior European states. The restoration of the rightfully prestigious position in the world has been a main objective for all Chinese governments after the political unification of the mainland.

Pursuit or restoration of the prestige by China thus has an important international component. Referring to the ‘century of humiliation’, Mao in 1958 said: *“In the past others have looked down on us. [...] Now let us do something for them to see”*.<sup>62</sup> In line with this statement and the continuous, if not always equal, political support for the space program Xi remarked at 2013 launch of Shenzhou-10: *“Developing the space program and turning the country into a space power is the space dream that we have continuously pursued.”*<sup>63</sup> He is also explicitly quoted by Chinese state media connecting space achievements to international status:

*“Space is an important field of scientific and technological progress and innovation, Xi said, adding that achievements in this regard are also important symbols of a country’s scientific and technological strength.”*<sup>64</sup>

Advancements in space are interwoven with the ‘rejuvenation’ or ‘renewal of the Chinese nation’, a narrative referring back to the prestigious status China used to hold in the world before the ‘century of humiliation’. In the State Council’s Information Office 2016 white paper on China’s space activities, the stated vision has a clear international connotation: *“to provide strong support for the realization of the Chinese Dream of the renewal of the Chinese nation, and make positive contributions to human civilization and progress”*.<sup>65</sup>

One major problem with the advancement of prestigious activities from a backward position is what R.P. Dore calls the ‘dilemma of pride and pupillage’.<sup>66</sup> If one wants to overcome backwardness in the pursuit of a more prestigious status, tutoring or assistance is needed. These however, imply deference to another who is then recognised as more prestigious. In order to accept tutoring, pride must be swallowed by the learning party by admitting it lacks knowledge and capability. One way out of this ‘dilemma’ is to focus on self-reliance. The 2016 white paper on China’s space activities declares that China’s historical experiences have *“opened up a path of self-reliance and independent innovation, and has created the spirit of China’s space industry.”*<sup>67</sup> This does entail long development times and slower progress, although this course had not been entirely voluntary during the space program’s history. In a June 1960, towards the height of the

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<sup>62</sup> Dore, ‘The Prestige Factor in International Affairs’, 194.

<sup>63</sup> Tian, ‘Backgrounder; Xi Jinping’s Vision for China’s Space Development’.

<sup>64</sup> Tian.

<sup>65</sup> ‘China’s Space Activities in 2016’ (Information Office of the State Council, 27 December 2016), <http://www.scio.gov.cn/zfbps/32832/Document/1537024/1537024.htm>.

<sup>66</sup> Dore, ‘The Prestige Factor in International Affairs’, 194.

<sup>67</sup> ‘China’s Space Activities in 2016’.

Sino-Soviet split, PLA Marshal Nie Rongzhen reports to Mao on technical assistance from the USSR:

*“We need to adopt a new way of doing things in our future scientific and technological dealings with the Soviet Union. When the time comes to do so, we should inquire about and still request all assistance that is set out in agreement. But if the other side won’t give [us the assistance], we certainly won’t press [the issue]; we’ll just keep account. In the last few months, staff members of our office in the Soviet Union have repeatedly pressed their inquiries, encountering many rebuffs, leaving the impression that we are in a desperate situation without Soviet assistance and, in this way, making the other side even more cocky and more controlling. We have already told these comrades that they should only ask lightly and just forget it if assistance is not forthcoming.”*<sup>68</sup>

While there was the clear influence of the escalating ideological conflict between the USSR and China, it wasn’t supposed to look as if China really *needed* the Soviet’s help. It seems that a combination between being a lack of assistance and a choice of pride over pupillage characterised the end of Sino-Soviet space cooperation.

The progress of China’s human spaceflight program throughout the 1990s and 2000s is especially telling evidence for the importance Chinese leadership attaches to prestige and status. A first attempt at putting a taikonaut in space had been made with the 1971 project 714. Although even selection of potential astronauts was made, the alleged coup and death of Lin Biao at the end of the year combined with PLA leadership of the program sealed its fate. The current Chinese human spaceflight program is part of project 921 initiated in 1992, also known as the Shenzhou program. While manned space programs tend to receive staggering amounts of political support, as is the case in China, their usefulness is often doubted. Costs are usually ten times higher than for a similar mission executed by robots.<sup>69</sup> National economic benefit of space stations is also difficult to disentangle from the standard effect of large government spending programs. If economy is the rationale, the state would certainly be better served by investing the same amount of funds in infrastructure or practical research. Military rationales are also dismissed, as both the US and USSR found no added military value in keeping astronauts/cosmonauts in space.<sup>70</sup> Science does stand to gain from a human space program, yet the caveat of the economic rationale also applies here. If advancement of science is the goal, investing the same amount of funds in universities and research groups instead of rockets is far more efficient. The human spaceflight program is, however, very effective at increasing prestige. Internationally, China has become part of a group of major powers that only included the US and USSR/Russia. Membership of this exclusive group confers a status that unrivalled by any other achievement. China was able to marshal enormous economic resources, build rockets capable of exiting the Earth’s atmosphere, raise its national scientific capability to world class, and provide political support for over a decade. The space program and especially the human spaceflight aspect has certainly raised

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<sup>68</sup> Rongzhen Nie, ‘Report by Nie Rongzhen to Mao Zedong Regarding Science and Technology (Abridged)’ (Wilson Center, 3 July 1960), Nuclear Proliferation International History Project, <http://digitalarchive.wilsoncenter.org/document/114348>.

<sup>69</sup> Cunningham, ‘The Stellar Status Symbol: True Motives for China’s Manned Space Program’.

<sup>70</sup> Cunningham.

China's prestige within the world community, while it is still being classified as a developing state by e.g. the World Bank.<sup>71</sup>

Prestige enhancing activities also has a domestic side, creating a sense of pride in the country's achievements and its political leadership. The CCP is aware of both the international and domestic prestige benefits emerging from its space program. For example, commenting on the Chang'e-1 lunar orbiter launch in 2007, Premier Wen Jiabao remarked that it had "*deep historical significance for raising our international standing and strengthening the force of our ethnic solidarity.*"<sup>72</sup> The vast and often mountainous periphery of the Chinese territory has been difficult to properly connect to the prosperous east. This has caused the minorities living in the peripheral Inner Mongolia, Xinjiang, Guangxi, Ningxia and Tibet autonomous regions to be in less contact with the central government in Beijing. As an alternative to expensive and expansive hard-wired communications, the space program facilitated satellite links to these areas.

The CCP leadership has taken every opportunity to tie its image to that of the space program, especially the human spaceflight program. Presence at launch sites, statements and speeches linking the program to the party ideology, creation of a national 'space day' and using taikonauts in public relations has cemented this link.<sup>73</sup> What must be noted, is that this outcome of enhancing the party's prestige, if not legitimacy, is a side-effect. Enhancing CCP prestige can be conceivably be done in many ways, and human spaceflight is the most expensive and least secure option.<sup>74</sup> So on the one hand, party prestige benefitting from the space program could not have been an important prestige rationale to induce China to start project 921. On the other hand, it could provide a prestige rationale for the continuation of the space program, even under future economic duress. The CCP has tied itself and the historic 'renewal of the Chinese nation' narrative to the space program, especially the human spaceflight component. Any and all failings in this program will therefore also be cast back onto the CCP, leading to potential 'loss of face' or reduction in party prestige. In fact, the human spaceflight program can be said to be a very public part of the CCP's performance legitimacy. This idea that China's ruling party is dependent on socio-economic performance as a justification for its rule was for a long time dominant and even connected to its earlier historical experiences.<sup>75</sup> However, it is currently being debated as ideology and social justice are increasingly seen as main legitimisation forces by Chinese elites.<sup>76</sup>

An interesting example of the role prestige play within the Chinese space program can be found in the earlier discussed Chang'e-4 mission to the far side of the moon. As it is the first lander on the far side, it is an both a civil/scientific and prestigious achievement. No other state

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<sup>71</sup> 'The World Bank In China', The World Bank, 19 April 2018, <http://www.worldbank.org/en/country/china/overview>.

<sup>72</sup> Sheehan, "Did You See That, Grandpa Mao?", 111.

<sup>73</sup> Sheehan, "Did You See That, Grandpa Mao?"

<sup>74</sup> Kulacki and Lewis, *A Place for One's Mat: China's Space Program, 1956-2003*, 31.

<sup>75</sup> Dingxin Zhao, 'The Mandate of Heaven and Performance Legitimation in Historical and Contemporary China', *American Behavioral Scientist* 53, no. 3 (November 2009): 416-33, <https://doi.org/10.1177/0002764209338800>.

<sup>76</sup> Bruce Gilley and Heike Holbig, 'The Debate on Party Legitimacy in China: A Mixed Quantitative/Qualitative Analysis', *Journal of Contemporary China* 18, no. 59 (March 2009): 339-58, <https://doi.org/10.1080/10670560802576083>; Jinghan Zeng, 'The Debate on Regime Legitimacy in China: Bridging the Wide Gulf between Western and Chinese Scholarship', *Journal of Contemporary China* 23, no. 88 (4 July 2014): 612-35, <https://doi.org/10.1080/10670564.2013.861141>.

has yet landed on the far side of the moon, making almost all observations scientific treasures. At the same time, it shows that China is able to conquer uncharted territory when it comes to high technology and space technology in particular. This uniqueness increases the international prestige of the Chinese space program, and with it that of the Chinese state and communist party.

As previously stated, the priority of rationales for a space program differ among states. A glimpse of the Chinese priorities can be extracted from the proposed landing site of the Chang'e-4 lander. The site is located within the South Pole-Aitken (SPA) basin, a location of scientific interest for the formation of the moon and its geological development. While a suitable location, it has been criticised by lunar scientist Dr. Paul D. Spudis for being a suboptimal landing zone for these scientific objectives.<sup>77</sup> He suggests that a site only 250 km east of the intended landing site would be easier for landing and more scientifically interesting. It is of course possible that CNSA and its international partners had not considered Dr. Spudis' arguments or disagree with them on scientific grounds.

However, it is striking that the proposed precise landing zone within the SPA basin will be the Von Kármán crater. This crater is named after Hungarian-American aerospace engineer Theodore Von Kármán, who worked at Caltech from 1930 and founded the Jet Propulsion Laboratory (JPL) in 1944. The JPL was to become a crucial hub for space technology in the US. Von Kármán's group was joined by Qian Xuesen in 1935. During the Second Red Scare in the 50's, Qian was accused of being a communist and detained for several years. Only one year after he returned to China in 1955, Qian became the first director of the Fifth Academy of the Chinese National Defence Ministry.<sup>78</sup> The establishment of this Fifth Academy in 1956 heralded the start of the Chinese missile and space program.<sup>79</sup> Qian was crucial in the early development of the Chinese spaceflight and nuclear weapons programs, earning him the nickname 'Father of Chinese Rocketry'.<sup>80</sup> Out of all the geological features on the far side of the moon, the Chinese rover will most likely land in the crater named after the man whose protégé was the 'Father of Chinese Rocketry'. As only a handful of geological features on the moon have names connected to China, and landing in one of them would emphasise the unique national achievement of this Chinese-led mission. Therefore, unless there are scientific arguments countering those of Dr. Spudis, CNSA has deliberately increased the mission risk in order to increase the symbolism of the achievement. Especially regarding the current scientifically suboptimal location with higher risk, the determination of the Chang'e-4 landing site should be seen as a fundamentally scientific, but ultimately prestige driven choice.

The major role prestige plays as a rationale for the Chinese space program is also doubted. Kulacki and Lewis consider the rationale explained as prestige differently:

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<sup>77</sup> Paul Spudis D., 'China's Journey to the Lunar Far Side: A Missed Opportunity?', *Air & Space/Smithsonian Magazine*, 14 July 2017, <https://www.airspacemag.com/daily-planet/chinas-journey-lunar-far-side-missed-opportunity-180963703/>.

<sup>78</sup> Evan Osnos, 'The Two Lives of Qian Xuesen', *The New Yorker*, 3 November 2009, <https://www.newyorker.com/news/evan-osnos/the-two-lives-of-qian-xuesen>.

<sup>79</sup> 'History of CASC'.

<sup>80</sup> Shaohui Tian, 'Exhibition on "Father of Chinese Rocketry" Opens in U.S.', *Xinhua*, 3 October 2015, [http://www.xinhuanet.com/english/2015-10/03/c\\_134681947.htm](http://www.xinhuanet.com/english/2015-10/03/c_134681947.htm).

*“not so much ‘prestige’ as ‘keeping up with the Joneses.’ In particular, the cases of Sputnik and Reagan’s SDI speech demonstrate that fear of falling behind was a much more powerful motivation than a sense that the party might improve its standing by launching satellites and astronauts into space.”*<sup>81</sup>

It is certainly true that the fear of lagging behind fuelled space program rationales, especially during the Cold War space race. However, this is also a prestige rationale. After all, falling behind compared to a competitor leads to ‘loss of face’ and the perceived superiority of the competitor. Party standing might not directly improve due to a satellite launch, but that would be a domestic prestige rationale. Relative international status however, will clearly benefit if a loss of prestige due to falling behind is avoided. In order to prevent loss of face, China used to refrain from live broadcasting of its rocket launches. A tight control over the publicity surrounding the space program was, and still to some extent is, used to shape the narrative. Another sign of China’s sensitivity to loss of prestige is the pace of the space program. China has far less budget allocated to CNSA than the US has to NASA, its space program goals are always on a longer timescale than those of other agencies, and not too ambitious.<sup>82</sup> When it comes to international prestige from its space program, China wants to rather be safe than sorry.

International prestige is a crucial rationale for the Chinese space program. Civil weather and communication satellites have a unique benefit for China. All other goals pursued through the space program can arguably be better obtained by traditional investment methods; whether regarding science, stimulation of the economy or domestic prestige for the CCP. However, overcoming its ‘century of humiliation’, reasserting itself as a regional and world power and showing the advanced capabilities of China to the international community, are feats requiring international prestige that is uniquely well conferred by the space program. This prestige potential of space achievements had been demonstrated first by the USSR. By successfully launching Sputnik 1 in October 1957, four months before the US launch of Explorer I, the USSR had dealt the US prestige in scientific and technological affairs a serious blow. As seen from the US, this damaging victory for the prestige of communism could even repeat itself. Just two years after the launch of Sputnik 1, the CIA considered the risk of another communist country gaining a similar prestige and propaganda success:

*“If successful in launching a satellite, the Communist Chinese would score a major propaganda coup, especially in Asia. There is no evidence that Communist China itself has such a capability; but, with considerable assistance from the USSR, the orbiting of a satellite from the Chinese mainland is a possibility”*<sup>83</sup>

While the Chinese did receive assistance from the USSR, it was short-lived and limited in scope. This forced the Chinese to continue their space program efforts alone, something that slowed down their progress significantly. At the same time, the Chinese emphasise the remarkable

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<sup>81</sup> Kulacki and Lewis, *A Place for One’s Mat: China’s Space Program, 1956-2003*, 31.

<sup>82</sup> Keith Zhai et al., ‘China’s Secretive Space Program Threatens NASA’s Dominance’, Bloomberg News, 28 November 2016, <https://www.bloomberg.com/graphics/2016-asia-space-race/china.html>.

<sup>83</sup> ‘THE SOVIET SPACE RESEARCH PROGRAM MONOGRAPH II’, Scientific intelligence report (CIA, 21 August 1959), 11.

achievement of building a successful space program that even includes an elaborate human spaceflight component that is completely made in China. After all, cooperation leads only to shared prestige.

## CHAPTER 2

### US Policy Towards the Chinese Space Program and its Origins

#### “Wind and Thunder are Stirring”

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Space programs have a strong military aspect that extends to all its manifestations through the concept of dual-use. This makes true, integrated space cooperation between states an achievement rarely attained. Scientific experimentation and commercial launch services have been the main areas of international cooperation regarding space. The ISS is the grand example of the former, commercial satellite launch abroad the best example of the latter. Over the years, launching of satellites became a market for companies wanting to launch their own satellites and with the start of SpaceX and Blue Horizon, also a market for companies wanting to launch other party's satellites.

This is in contrast with the earlier stages of commercial space cooperation, when governments bought and sold each other parts of their technical knowledge or even equipment. In fact, in 1978 Deng Xiaoping decided that the domestic and educational merits of a communication satellite were so great, that one should be acquired by purchase rather than indigenous development.<sup>84</sup> While Chinese development of a communications satellite was already underway, it was progressing so slow for Deng. By choosing to try purchasing a US satellite, Deng chose quick educational improvements over domestic and international prestige that could be gained from a domestically developed satellite. At the time of this consideration, China was negotiating with the Carter administration about a high-level delegation visit to normalize relations. The deal on the sale of the COMSAT ultimately fell through for unclear reasons, even though both parties were interested in the sale. The 1972 visit of president Nixon to China and his meetings with Mao Zedong and Zhou Enlai had set the stage for this improvement between the US and China. Ultimately capitalising on the 1960 Sino-Soviet split, the US sought to strategically balance against the USSR by forging closer ties with China. Interesting to note is that Science & Technology (S&T) cooperation already played a role in these first steps by Nixon, that prepared the way for the Carter-Deng relationship. Some forty possible scientific and technological projects were drafted by the US to showcase that meaningful cooperation would also follow the change in the political relationship.<sup>85</sup>

With the official normalisation of relations on January 1, 1979 and the upgrading of the Beijing and Washington liaison offices to embassies, the actual S&T agreement followed.<sup>86</sup> The

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<sup>84</sup> Kulacki and Lewis, *A Place for One's Mat: China's Space Program, 1956-2003*, 16.

<sup>85</sup> 'International Science and Technology Cooperation', Pub. L. No. 110-89, § Subcommittee on Research and Science Education (2008), <https://www.gpo.gov/fdsys/pkg/CHRG-110hhrg41470/html/CHRG-110hhrg41470.htm>.

<sup>86</sup> 'Agreement between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology', 31 January 1979, [http://www.us-china-cerc.org/pdfs/US\\_China\\_Scientific\\_Technological\\_Agreement\\_31\\_Jan\\_1979.pdf](http://www.us-china-cerc.org/pdfs/US_China_Scientific_Technological_Agreement_31_Jan_1979.pdf).

main text of the 1979 'Agreement Between the United States of America and the People's Republic of China on Cooperation in Science and Technology' dealt with the beginning of scientific contact between the two countries, funding, intellectual property rights, and the establishment of the 'US-PRC Joint Commission on Scientific and Technological Cooperation'. Already mentioned in article 2 of the agreement in a non-exhaustive list of areas for cooperation, was space. In fact, one of the three additional 'understandings' added to the agreement dealt specifically with space cooperation and was signed a month earlier. This understanding was the result of a meeting in Washington between Dr. Jen Hsin-min, Director of the Chinese Academy of Space Technology (CAST) and Dr. Robert A. Frosch, Administrator of NASA. It reflected the continued interest in close civil space cooperation, as well as the intended sale of a US COMSAT to China with the launch carried out by NASA:

*"This understanding includes: 1. Cooperation in the development of the civil broadcasting and communications system of the PRC. The PRC intends, under suitable conditions, to purchase a U.S. satellite broadcasting and communications system, including the associated ground receiving and distribution equipment."*<sup>87</sup>

Additionally, the agreement referenced the intended purchase by China of a US ground station that could receive information for the US's Earth resource satellite Landsat. Further cooperation on peaceful use of space was also envisioned:

*"It was also agreed that, through further discussions and correspondence, both sides would develop the details of the understanding described above and consider other fields of civil space cooperation which could be of mutual interest and benefit."*<sup>88</sup>

Apart from the single Landsat station, the cooperation on a government level would not further materialize for a while. Instead, China focussed on joining the international launch market with their Chang Zheng launchers. The China Great Wall Industry Corporation (CGWIC) was founded in 1980 to engage in these commercial space activities. Although their prices were very competitive, quotas on satellites that could be launched by China combined with an opaque track record of their rockets led to fewer costumers than expected.<sup>89</sup> Three export licences were granted in 1988 by the Reagan administration for the launch of US commercial satellites by China, yet this good start would not last. In the beginning of June 1989, the Chinese leadership ordered a violent military crack-down on protestors at Tiananmen square. This was a critical turning point in Sino-US relation, which after Nixon's visit in 1972 had mostly been improving. The US reacted with the imposition of harsh economic sanctions and a general arms embargo on China. Part of these sanctions was the prohibition and discontinuation of commercial satellite export licences; the three granted under Reagan were still underway and their progress therefore stalled. Important to note is that here the curtailing of space cooperation was used as an economic

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<sup>87</sup> 'Agreement between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology'.

<sup>88</sup> 'Agreement between the Government of the United States of America and the Government of the People's Republic of China on Cooperation in Science and Technology'.

<sup>89</sup> Handberg and Li, *Chinese Space Policy: A Study in Domestic and International Politics*, 104–5.

pressure method, linked to human rights concerns. The satellites were eventually still launched, as Congress allowed president Bush Sr. to twice waive the sanctions on condition of Chinese human rights progress or reasons of 'national interest'.<sup>90</sup> With the arms embargo and economic space-related 1990 'Tiananmen square sanctions' against China, the tone for Sino-US cooperation on space was set for the decades ahead.

## 1. RESTRICTIVE REGULATION

Several US domestic laws controlling satellite export contributed to a severe restriction on space cooperation between the US and China. Central legislation in this regard on the military side is the 1976 International Traffic in Arms Regulation (ITAR), controlling items on the United States Munitions List (USML) and the Missile Technology Control Regime (MTCR) annex. On the commercial side, the 1976 Arms Export Control Act (AECA) controls less sensitive items that are still considered dual-use. By making this distinction, arms industry in the US is allowed to export certain items under Department of Commerce's AECA Commerce Control List (CCL) to most countries without the specific licencing needed under the State Department's ITAR. Almost all missile technology and advanced or military space technology falls under the ITAR, while less advanced civil end-use satellites have been switched between ITAR and AECA over the years.<sup>91</sup>

Before 1992, all satellite technology was on subject to the ITAR which has such strict requirements for export licences that even export to NATO allies is difficult. Additionally, the Tiananmen square sanctions prohibited any exports of ITAR restricted items to China. Change came under the Bush sr. administration, when it in 1992 decided that communications satellites would fall under the AECA.<sup>92</sup> The Department of Commerce regulations made it considerably easier for manufacturers to export COMSATs, although some were subject to the stricter CCL 'series 600' regulation. Meanwhile, satellite technology and manufacturing details remained under the ITAR, creating an ambiguous situation. In 1996, president Clinton first moved satellite licencing jurisdiction from the State Department to Commerce, followed later by all COMSAT export jurisdiction.<sup>93</sup> US satellite manufacturers were prohibited by Tiananmen square sanctions from exporting to China at first, but reclassification to the Department of Commerce's CCL gave more opportunities during the 1990's.

The progress on tentative relaxation of a part of the regulation on the space industry's export to China was undone by a key event in Sino-US space relations: the public 1999 'Cox report'. A House Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China ('Cox Committee') was created in 1998. Initially, it had been set up with the aim of investigating 'possible impeachable offenses in the Clinton Administration's

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<sup>90</sup> Reddy, 'U.S.-China Space Cooperation', 237.

<sup>91</sup> 'China - U.S. Export Controls', [export.gov](https://www.export.gov/article?id=China-U-S-Export-Controls), 25 July 2017, <https://www.export.gov/article?id=China-U-S-Export-Controls>.

<sup>92</sup> James Lewis Andrew, 'Regulating Satellite Exports' (Center for Strategic and International Studies, 2 May 2003), <https://www.csis.org/analysis/regulating-satellite-exports>.

<sup>93</sup> Kurtis Zinger J., 'An Overreaction That Destroyed an Industry: The Past, Present, and Future and U.S. Satellite Export Controls', *University of Colorado Law Review* 86, no. 1 (2015): 351-87.

policy of encouraging commercial exports to China'.<sup>94</sup> The main allegation was that Clinton's 1996 COMSAT export relaxation was bought by a donation from Chinese officials to his campaign.<sup>95</sup> Additionally, the Hughes Space and Communications International and Space Systems Loral incidents fuelled the support for the creation of the Cox Committee. These two US satellite companies had arranged for satellites launches on Chinese rockets, that both failed. In the subsequent technical investigation by the companies, documents were handed over to the Chinese rocket manufacturers that allegedly allowed them to improve their rockets; something strictly prohibited under the ITAR. However, during its hearings, the Cox committee drifted towards a consideration of all military, space and nuclear technology transferred to, or stolen by China from the US in almost two decades. The report also includes an elaborate discussion of the historic development of China's rockets and missiles, targeting distances to various Western cities and presumptions on the development aims. Its final public allegations were in fact mostly related to the progress China allegedly was able to make from stolen US nuclear and missile technology.<sup>96</sup>

The Cox report is quite widely criticised, both for its accuracy and its tone. It ignores in what has even been called an 'ahistorical' fashion the close military and intelligence cooperation during the late 1980's. Back then, China was still a major Cold War asset in the strategic balancing against the USSR. In 1987, for example, advanced torpedoes, navy engines and aircraft improvements were sold to the Chinese.<sup>97</sup> More importantly, the US intelligence community seemed to disagree with the strident allegations towards China. This is seen in an assessment from the Director of Central Intelligence, released shortly after the Cox report. The working group of the assessment involved all relevant security and defence departments and agencies, as well as a group of weapon experts. In the public release of their assessment, they remarked on the plurality of China's technology sources, and the extent of visible improvement of Chinese forces:

*"China's technical advances have been made on the basis of classified and unclassified information derived from espionage, contact with US and other countries' scientists, conferences and publications, unauthorized media disclosures, declassified US weapons information, and Chinese indigenous development. The relative contribution of each cannot be determined. [...] To date, the aggressive Chinese collection effort has not resulted in any apparent modernization of their deployed strategic force or any new nuclear weapons deployment."*<sup>98</sup>

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<sup>94</sup> Jeff Gerth and Tim Weiner, 'Tracking Suspicions About China's Atom Spying', *The New York Times*, 23 May 1999, <https://www.nytimes.com/1999/05/23/world/tracking-suspicions-about-china-s-atom-spying.html>.

<sup>95</sup> Jeff Gerth, 'Democratic Fund-Raiser Said to Detail China Tie', *The New York Times*, 15 May 1998, <https://www.nytimes.com/1998/05/15/us/democrat-fund-raiser-said-to-detail-china-tie.html>.

<sup>96</sup> Christopher Cox et al., 'U.S. National Security and Military/Commercial Concerns with the People's Republic of China', Declassified (House Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China, 25 May 1999).

<sup>97</sup> Jonathan Pollack D., 'The Cox Report's "Dirty Little Secret"', Arms Control Association, 1 April 1999, [https://www.armscontrol.org/act/1999\\_04-05/jpam99](https://www.armscontrol.org/act/1999_04-05/jpam99).

<sup>98</sup> 'DCI Statement on Damage Assessment' (Central Intelligence Agency, 21 April 1999), <https://fas.org/sgp/news/dci042199.html>.

While the accuracy of the historic and contemporary assessments in the 1999 Cox report are contested, its tone is clearly in line with the ‘China threat theory’ discussed later.

Due to the Hughes and Loral incident, the Clinton donation allegations and especially the classified Cox report’s alarming allegations, the commercial satellite export licencing authority was returned to the state department. This return to stricter export regulations under the ITAR became law in section 1513 of the ‘Strom Thurmond National Defense Authorization Act for Fiscal Year 1999’ (P.L. 105-261 or Strom Thurmond NDAA).<sup>99</sup> Because products containing ITAR regulated items are barred from transfer to third parties, attempts at ‘ITAR-free’ satellites were made by foreign companies. Mostly due to the return to the strict ITAR, the share of worldwide satellite manufacturing by the US dropped almost 25% from 1997 to 2007.<sup>100</sup>

Aside from the back-and-forth on satellite export licencing authority, 1999 was significant for the new restrictions placed specifically on China regarding space technology. In the ‘Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999’ (P.L. 105-277), the following provision was included for the first time:

*“Provided further, That no funds may be obligated or expended for processing licenses for the export of satellites of United States origin (including commercial satellites and satellite components) to the People’s Republic of China, unless, at least 15 days in advance, the Committees on Appropriations of the House and the Senate and other appropriate Committees of the Congress are notified of such proposed action.”*<sup>101</sup>

In similar language, the restriction continues to this day as section 7043.(d).(1) in the ‘Consolidated Appropriations Act, 2018’ (P.L. 115-141).<sup>102</sup> This provision inserts Congressional oversight in the export licencing of satellites, increasing the obstacles for successful export to China on top of the reinstated ITAR restrictions.

The Strom Thurmond NDAA also targets the possibility of missile technology transfer to China. Section 1512 requires the president to certify AECA controlled missile technology export 15 days in advance. The certification must show that (1) the export is not detrimental to the US space launch industry, and (2) the export will not directly or indirectly improve the Chinese missile or space launch capabilities.<sup>103</sup> Although understandable from a national security perspective, section 1512 seems redundant as it would be very unlikely that any US administration would engage in advanced missile exports to China. Still, it is another example of increased Congressional influence on the export policy and space cooperation regarding China of any US administration.

The restrictions placed on the sharing or export of items subject to ITAR – which encompasses all items produced by NASA – combined with the political climate meant even less

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<sup>99</sup> Floyd Spence, ‘Strom Thurmond National Defense Authorization Act for Fiscal Year 1999’, Pub. L. No. 105-261 (1998), sec. 1513.

<sup>100</sup> Zinger, ‘An Overreaction That Destroyed an Industry: The Past, Present, and Future and U.S. Satellite Export Controls’.

<sup>101</sup> Frank Wolf R., ‘Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999’, Pub. L. No. 105-277 (1998), chap. Export Administration.

<sup>102</sup> Edward Royce R., ‘Consolidated Appropriations Act, 2018’, Pub. L. No. 115-141 (2018), sec. 7043.

<sup>103</sup> Spence, Strom Thurmond National Defense Authorization Act for Fiscal Year 1999, sec. 1512.

prospects of possible NASA-CNSA cooperation. During a 2008 hearing of the House Subcommittee on Research and Science Education concerning international science and technology cooperation, Michael O'Brien, assistant administrator for external relations of NASA testified to these obstacles:

*“In other cases, NASA clearly recognizes that as we explore opportunities for cooperation with non-traditional partners such as India, Korea, Ukraine, China and others, enhanced interagency and Congressional coordination will be required to ensure that broader U.S. Government interests and any potential legal restrictions are carefully addressed.”*<sup>104</sup>

In 2006, a Congressional report on ‘United States - China Science and Technology Cooperation’, under the 1979 Carter-Deng S&T Agreement identified only one single NASA cooperation agreement with China. The project’s subject was plate tectonics and geodynamics, starting in 1992 and being extended for five years in 2005 after which it has stopped. No funds were exchanged, only limited project-specific activities were allowed.<sup>105</sup> Both because of the Congressional pressure causing the hesitation of NASA’s top officials and the fact that there was only one small cooperation project initiated between NASA and Chinese scientists justifies the 2006 Congressional report’s characterisation of the cooperation as ‘extremely limited’.

The situation regarding commercial space exports changed again in 2013, making a turn towards relaxation of regulations for the first time since 1999. US satellite manufacturing and the US’s share in the commercial space industry had dropped dramatically through a combination of factors, but mostly due to the application of the very restrictive ITAR to all satellite technology. President Obama requested a broad review of the US export control regime in 2009, leading to the 2012 joint Department of Defence and Department of State (DoD-DoS) space export control review. This review found that the US has the most restrictive export controls in place when compared to other countries, while there was technology on the USML that had become less sensitive over time, partially due to the increase in capability and knowledge of other states. NATO allies and close partners were found to be subject to unnecessarily strict regulations as well.<sup>106</sup> The report’s recommendations were implemented in section 1261, called the ‘Smith amendment’, in the ‘National Defense Authorization Act for Fiscal Year 2013’ (P.L. 112-239).<sup>107</sup> This section provides for the reclassification of less sensitive satellites from the USML to the CCL and the return of presidential authority over export control classification which was removed in the 1999 Strom Thurmond NDAA.

While overall significantly relaxing restrictions on satellite technology export, China was specifically and completely excluded from this change. Under section 1261.(c), the reclassified satellites are barred from being “*exported, re-exported, or transferred, directly or indirectly*” to

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<sup>104</sup> International Science and Technology Cooperation.

<sup>105</sup> ‘United States - China Science and Technology Cooperation’, Biennial Report to the U.S. – China Economic & Security Review Commission (Bureau of Oceans & International Environmental & Scientific Affairs, December 2006), <https://2001-2009.state.gov/documents/organization/96437.pdf>.

<sup>106</sup> ‘Risk Assessment of US Space Export Control Policy’.

<sup>107</sup> Howard McKeon P., ‘National Defense Authorization Act for Fiscal Year 2013’, Pub. L. No. 112–239 (2013).

China (as well as North Korea and state sponsors of terrorism).<sup>108</sup> This prohibition also extends to launch services in any way connected to China. Still, Congress also inserted the option of a presidential waiver for this prohibition, if the president determines that it is in the national interest of the US and notifies Congress. These same requirements are also imposed on the reclassification of satellite technology from the USML to the CLL under 1261.(a). The main differences lies in that paragraph (a) allows for permanent reclassification, while paragraph (c) requires a case-by-case analysis and notification of Congress.<sup>109</sup> Through the mechanism of section 1261.(c), Congress ensured its oversight for all satellite related issues regarding China and created an additional barrier that had to be overcome every single time.

Just as 1999 was a milestone for limiting Sino-US commercial space engagement due to effects of the Cox report, so 2011 was a milestone for limiting broader Sino-US space cooperation. The provisions included in the 'Department of Defense and Full-Year Continuing Appropriations Act, 2011' (P.L. 112-10) prohibit all cooperation of NASA and the White House's Office of Science and Technology Policy (OSTP) with Chinese governmental entities.<sup>110</sup> It also specifically prohibits all cooperation with Chinese-owned companies, a rule stemming from the increasingly broad global commercial space sector and the strong governmental and PLA ties of many Chinese companies. While commercial satellite launch and technology sale was already restricted, more and more companies also provide other space related services and products that do not fall under the Strom Thurmond NDAA provisions. In full, the prohibitive section 1340 of P.L. 112-10 reads:

*"Sec. 1340. (a) None of the funds made available by this division may be used for the National Aeronautics and Space Administration or the Office of Science and Technology Policy to develop, design, plan, promulgate, implement, or execute a bilateral policy, program, order, or contract of any kind to participate, collaborate, or coordinate bilaterally in any way with China or any Chinese-owned company unless such activities are specifically authorized by a law enacted after the date of enactment of this division.*

*(b) The limitation in subsection (a) shall also apply to any funds used to effectuate the hosting of official Chinese visitors at facilities belonging to or utilized by the National Aeronautics and Space Administration."*<sup>111</sup>

The provision was introduced by House representative Frank Wolf of Virginia, the chairman of the House Appropriations Subcommittee on Commerce, Justice, Science, and Related Agencies which controls the NASA budget. Because of this, it is also referred to as the 'Wolf amendment'. This Congressional 'power of the purse' places limitations on the policy of the executive branch. By taking away any means of funding, Congress effectively shut down Sino-US space cooperation completely with the 2011 appropriations act.

During 2013, it seemed that there would be positive developments regarding the Congressional ban on space cooperation. First, in March, the 'Consolidated and Further

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<sup>108</sup> McKeon, sec. 1261.

<sup>109</sup> McKeon, sec. 1261.

<sup>110</sup> Harold Rogers, 'Department of Defense and Full-Year Continuing Appropriations Act, 2011', Pub. L. No. 112-10 (2011).

<sup>111</sup> Rogers, sec. 1340.

Continuing Appropriations Act, 2013' (P.L. 113-6) was passed.<sup>112</sup> Although it included the same Wolf amendment language (now section 535), it also introduced an exception to the comprehensive prohibition. Under subsections (c) and (d), an exception was made for projects for which (1) NASA or OSTP could certify that there would be no technology or information transfer to China and (2) there would be no involvement of officials implicated in human rights violations.<sup>113</sup> This certification should be to the Congressional appropriations committees and also include an elaborate overview of the project. While theoretically providing an option for cooperation, these requirements are still very strict and their fulfilment hard to prove conclusively. Second, in December 2013, Frank Wolf announced his upcoming retirement in January 2015, meaning that there would be a new subcommittee chair in the 114<sup>th</sup> Congress. Hope was expressed that this would be the end of the ban on cooperation introduced by him.<sup>114</sup> However, under the new chairman John Culberson of Texas, the ban continued.<sup>115</sup> In the corresponding section 530 of the 'Consolidated Appropriations Act, 2017' (P.L. 115-31), FBI consultation was even added to the possibility of exemption from the ban detailed in subsections (c) and (d).<sup>116</sup> Despite the retirement of Frank Wolf, the comprehensive ban on Sino-US cooperation continues to this day in the Consolidated Appropriations Act, 2018 (P.L. 115-141).<sup>117</sup>

The introduction of the ban on space cooperation in 2011 was prompted by the Obama administration's decision to explore possible cooperation with China on space-related subjects. The first clear sign came in the China-US Joint Statement issued during president Obama's visit to China in November 2009:

*"China and the United States look forward to expanding discussions on space science cooperation and starting a dialogue on human space flight and space exploration, based on the principles of transparency, reciprocity and mutual benefit."*<sup>118</sup>

This contact resulted in NASA administrator Charles Bolden visiting China in October 2010, hosted by CNSA. He remarked that:

*"Although my visit did not include consideration of any specific proposals for future cooperation, I believe that my delegation's visit to China increased mutual understanding on the issue of*

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<sup>112</sup> Harold Rogers, 'Consolidated and Further Continuing Appropriations Act, 2013', Pub. L. No. 113-6 (2013).

<sup>113</sup> Rogers, sec. 535.

<sup>114</sup> Zach Rosenberg, 'This Congressman Kept the U.S. and China From Exploring Space Together', *Foreign Policy*, 17 December 2013, <https://foreignpolicy.com/2013/12/17/this-congressman-kept-the-u-s-and-china-from-exploring-space-together/>.

<sup>115</sup> 'Chairman Rogers Announces Subcommittee Chairs for the 114th Congress' (U.S. House Committee on Appropriations, 20 November 2014), <https://appropriations.house.gov/news/documentsingle.aspx?DocumentID=393909>.

<sup>116</sup> Paul Cook, 'Consolidated Appropriations Act, 2017', Pub. L. No. 115-31 (2017), sec. 530.

<sup>117</sup> Royce, Consolidated Appropriations Act, 2018, sec. 7043.

<sup>118</sup> 'China-US Joint Statement' (Ministry of Foreign Affairs of the People's Republic of China, 17 November 2009), [http://www.fmprc.gov.cn/mfa\\_eng/wjdt\\_665385/2649\\_665393/t629497.shtml](http://www.fmprc.gov.cn/mfa_eng/wjdt_665385/2649_665393/t629497.shtml).

*human spaceflight and space exploration, which can form the basis for further dialogue and cooperation in a manner that is consistent with the national interests of both of our countries.*"<sup>119</sup>

The visit drew strong criticism from three members of Congress in particular: Frank Wolf, John Culberson and Dana Rohrabacher. Just one day before the departure of Bolden, a letter was sent to him by these Congressmen requesting a full briefing on the travel itinerary, official contacts, topics that were discussed and agreements reached. No such briefing was held after the visit. The letter called Chinese intentions in space 'questionable at best', and opened with: "*As you know, we have serious concerns about the nature and goals of China's space program and strongly oppose any cooperation between NASA and China.*"<sup>120</sup> In addition to the briefing, the Congressmen asked for personal assurance that there would be no discussions on human space flight cooperation. Frank Wolf's own letter to Bolden sent earlier on the October 5<sup>th</sup>, was even more strongly worded and equally specific: "*It should go without saying that NASA has no business cooperating with the Chinese regime on human spaceflight*"<sup>121</sup>

The criticism expressed by the three Congressmen, likely contributed to the change in tone of White House statements on space cooperation with China. Just a few months after Bolden's visit, the January 2011 US-China Joint Statement signed during president Hu Jintao's visit to Washington, read:

*"The United States and China agreed to take specific actions to deepen dialogue and exchanges in the field of space. The United States invited a Chinese delegation to visit NASA headquarters and other appropriate NASA facilities in 2011 to reciprocate for the productive visit of the U.S. NASA Administrator to China in 2010. The two sides agreed to continue discussions on opportunities for practical future cooperation in the space arena, based on principles of transparency, reciprocity, and mutual benefit."*<sup>122</sup>

Noticeable here is that the specific mentioning of space science, exploration and most importantly human space flight have been removed, compared to the November 2009 Joint Statement. Seen as how human space flight was also the main focus in the Congressional criticism, it is likely that the White House was influenced in the wording of the Joint Statement by the pressure of the Congressmen. Still, this change in language was not enough to prevent the Wolf amendment from being included in 2011 appropriations act, which passed the House and Senate on April 14<sup>th</sup> 2011.<sup>123</sup> However, another change is that the January 2011 Joint Statement calls for 'specific actions' not only on deepening dialogue, but also on 'exchanges in the field of space'. The changing White House language could have been a way to circumvent the Congressional criticism and still signal the Obama administration's to increase space cooperation to China.

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<sup>119</sup> David Weaver, 'NASA Administrator Statement On China Visit' (NASA Headquarters, 25 October 2010), [https://www.nasa.gov/home/hqnews/2010/oct/HQ\\_10-270\\_Bolden\\_China.html](https://www.nasa.gov/home/hqnews/2010/oct/HQ_10-270_Bolden_China.html).

<sup>120</sup> John Culberson et al., 'Will Bolden Brief Congress?', 15 October 2010, <https://culberson.house.gov/news/documentsingle.aspx?DocumentID=353248>.

<sup>121</sup> Amy Klamper, 'U.S. Lawmaker Balks at NASA Chief's China Visit', Space.com, 9 October 2010, <https://www.space.com/9295-lawmaker-balks-nasa-chief-china-visit.html>.

<sup>122</sup> 'U.S. - China Joint Statement' (The White House, Office of the Press Secretary, 19 January 2011), <https://obamawhitehouse.archives.gov/the-press-office/2011/01/19/us-china-joint-statement>.

<sup>123</sup> Rogers, Department of Defense and Full-Year Continuing Appropriations Act, 2011.

The continuation of the Obama administration's space cooperation talks with China lead the OSTP into a legal battle against the limitations of the Wolf Amendment. In 2009, Hu Jintao and Barack Obama announced the U.S.–China Strategic and Economic Dialogue (S&ED), a high-level bilateral platform. During the second round of meetings, John Holdren was already participating as the OSTP Director. However, his participation during the third round of meetings on May 9 and 10, 2011 was decried by Frank Wolf. As the Wolf Amendment had just become law less than a month ago, his attendance meant that OSTP funds were being used to facilitate a bilateral conversation with Chinese officials and were therefore against the law. The Government Accountability Office (GAO) agreed with Wolf's claim, stating that OSTP had violated the Antideficiency Act prohibiting entities from spending more than appropriated by Congress.<sup>124</sup> However, as Holden reported to president Obama later that year, the Department of Justice's (DoJ) Office of Legal Counsel had issued an informal opinion before the meetings in May stating that the Wolf Amendment was at least partially unconstitutional.<sup>125</sup> As the OSTP is part of the executive office of the president, when its officials engage in diplomatic contact they do so through the exclusive power of the president to conduct diplomacy. This makes the Wolf Amendment's restriction of OSTP activities unconstitutional according to the formal opinion of the DoJ, which is binding on executive branch agencies.

The precedent set by the OSTP's successful challenge of the Wolf Amendment may be used to also challenge the restrictions on NASA. While the OSPT is an agency of the executive office of the president, NASA is an independent agency within the executive branch. The special position of the OSTP within the executive branch is noted in the DoJ opinion, yet not cited as a reason for the dismissal of the Wolf Amendment restrictions as unconstitutional. Rather, the opinion states more broadly:

*“To the extent that funding conditions such as those set out in section 1340(a) bar the President from conducting international diplomacy through his chosen agents, they unconstitutionally interfere with the President's foreign affairs powers and may be disregarded by Executive Branch agencies.”*<sup>126</sup>

As NASA is an executive branch agency, albeit not part of the president's executive office, NASA officials can be chosen agents in foreign diplomacy pursued by the president. This means that such a NASA activity, for example in science cooperation with Chinese officials, would also receive a similar DoJ opinion that the Wolf Amendment may be disregarded. While such a challenge of the restrictions by NASA has not taken place yet, the broad exemptions provided by the 2011 DoJ opinion indicate that it would likely be successful. If the Wolf Amendment will be found unconstitutional, that would be the first step towards creating real opportunities for increased engagement and cooperation between the US and China in space.

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<sup>124</sup> Lynn Gibson H., 'Office of Science and Technology Policy—Bilateral Activities with China', 11 October 2011, <https://www.gao.gov/decisions/appro/321982.pdf>.

<sup>125</sup> John Holdren P., 31 October 2011, <https://www.gao.gov/assets/660/650532.PDF>.

<sup>126</sup> Virginia Seitz A., 'Unconstitutional Restrictions on Activities of the Office of Science and Technology Policy in Section 1340(a) of the Department of Defense and Full-Year Continuing Appropriations Act, 2011' (Office of the Legal Counsel, 19 September 2011), 3, <https://www.justice.gov/olc/opinion/unconstitutional-restrictions-activities-office-science-and-technology-policy-section>.

## 2. CHINA THREAT THEORY AND US ACTORS

The so-called 'China threat theory' has been a central driving force for the development of the US exclusionist policy towards the Chinese space program. It interprets the resurgence of China on the world stage as that of an inherently revisionist power and diametrically opposed to the US and its interests, with no escape from conflict possible. Advocates argue that China wants to spread its communist ideology, rebuild its military to threaten the regional stability and use its economic power to place others in a stranglehold. These concerns are also connected to human rights advocacy and support for both Tibet and democratic Taiwan by the advocates, often by attempting to link these issues to unrelated military or economic negotiations. Accordingly, those looking for engagement and cooperation are seen as willingly compromising US security, national interests and core values for personal or political gain.<sup>127</sup> The influence of this perception of China in US politics can be traced through the most important developments of the US exclusionist policy vis-à-vis the space program and its advocates.

The China threat theory is central to the Cox report's tone and way in which it disseminates Chinese military developments. This tone of aversion to and concomitant fear of China and its political functioning can already be seen in the first chapter of the first volume of the Cox report. The authors displayed a full-page photograph of the CCP leadership with the state seal and red flags behind them, with the overlaying text: "*The CCP's main aim for the civilian economy is to support the building of modern military weapons and to support the aims of the PLA.*" (Figure 1.).<sup>128</sup> This is an odd statement as China had just reduced its defence spending from 2,5% of GDP in 1992 to 1,7% during 1995-1998 and 1,9% in 1999. At the same time, the US defence spending was at an all-time low of 'only' 2,9% of GDP after a 4,6% peak in 1992.<sup>129</sup> While this is just an example, Cox report places emphasis on two central aspects of the Chinese space program in between elaborate technical assessments and a wide range of speculation about future developments: the combined military-civil roots of the space program and the nature of dual-use technology. "*Since their origin, the PRC missile and space programs have been tied together. The PRC can apply the same system refinements and modifications to both its rockets and ICBMs.*"<sup>130</sup> All national economies are partially used to support the military, all major space programs have military origins and almost all space technology is dual use. Still, the Cox report presents this general information as though these are special characteristics of China, or applicable to China to a radical extent compared to other states. Just the first of its three unclassified volumes encompasses more than 200 pages detailing the (perceived) threat emanating from China. In comparison, the Senate select committee on intelligence publicly published only three pages on the investigation of similar scope of the same topics in its 1999 special report 106-3 (the 'Shelby Report'). Its language is far more neutral towards Chinese intentions other than the acquisition of

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<sup>127</sup> Emma V. Broomfield, 'Perceptions of Danger: The China Threat Theory', *Journal of Contemporary China* 12, no. 35 (May 2003): 265–84, <https://doi.org/10.1080/1067056022000054605>.

<sup>128</sup> Cox et al., 'U.S. National Security and Military/Commercial Concerns with the People's Republic of China', 5.

<sup>129</sup> Stockholm International Peace Research Institute, 'Military Expenditure (% of GDP)', The World Bank, n.d., <https://data.worldbank.org/indicator/MS.MIL.XPND.GD.ZS?end=2016&locations=US-CN&start=1960&view=chart>.

<sup>130</sup> Cox et al., 'U.S. National Security and Military/Commercial Concerns with the People's Republic of China', 175.

US technology, and more condemning of failures in US oversight.<sup>131</sup> While academics have strongly disputed the factual accuracy of the Cox report, Joseph Cirincione, a nuclear weapons policy and conflict resolution expert even went so far as to say that it is not a Congressional report, but a propaganda piece.<sup>132</sup> The Cox report frequently connects technological development to a presumed strategic goal that China would be able to accomplish with the new technology. This includes regional destabilisation, targeting of Western cities with a 'city-busting' strategy, and the often stressed forceful reclaiming of Taiwan. Also, president Clinton's liberalisation of space technology export regulations is criticised as endangering the fundamental security interest of the US. The tone of the Cox report therefore falls in line with the language and rhetoric used by the China threat theorists.

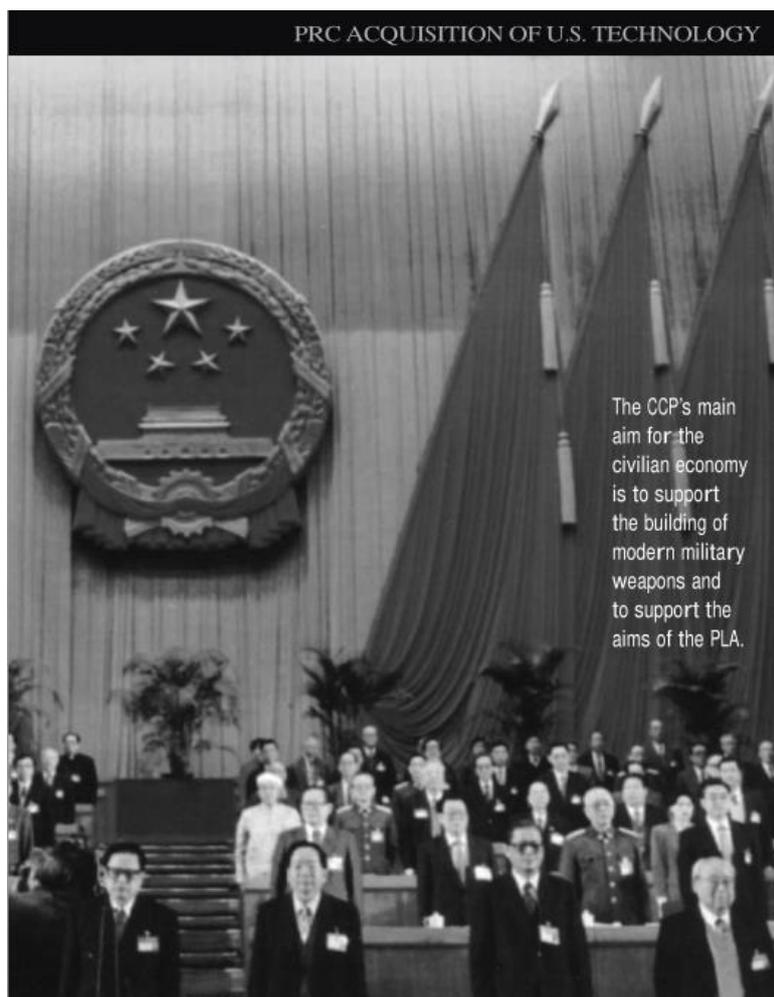


Figure 2: *The Cox report's take on the CCP in 1999.*<sup>133</sup>

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<sup>131</sup> Richard Shelby C. et al., 'Special Report of the Select Committee on Intelligence United States Senate', 3 February 1999.

<sup>132</sup> Alastair Iain Johnston et al., 'The Cox Committee Report: An Assessment' (Stanford: Center for International Security and Cooperation, December 1999); Joseph Cirincione, 'Cox Report and the Threat from China' (CATO Institute, 7 June 1999), <http://carnegieendowment.org/publications/index.cfm?fa=view&id=131&prog=zgp&proj=znpp>.

<sup>133</sup> Cox et al., 'U.S. National Security and Military/Commercial Concerns with the People's Republic of China', 5.

After the 1999 Cox report, a handful of actors could be identified that have strongly advocated for the cessation of all US space cooperation with China, and succeeded to a large extent. These are House representatives Frank Wolf (R-VA), John Culberson (R-TX), Dana Rohrabacher (R-CA), Lamar Smith (R-TX), Brain Babin (R-TX) and Richard Fisher from the thinktank 'International Assessment and Strategy Center'. These house representatives have been members and chairmen on several House committees critical for the direction of Sino-US space cooperation. Their influence on the Congressional debate can be traced throughout several hearings, Congressional reports and public comments, all of which are contain language of China threat theory proponents. Another influential actor is Richard Fisher, B.A., who has been invited numerous times to take part in Congressional hearings and reports by these representatives. While several non-partisan think tank members and technical experts have also taken part in these, the recurring participation of Fisher and his extremely suspicious stance towards China represents the extent to which China threat views are accepted in Congress. On top of this, the Congressmen have accepted each other's testimony on the subject in hearings of their own (sub)committee. The crucial positions this small group of Congressmen hold, combined with their support of each other and selection of witnesses, have multiplied the influence of China threat theory on the Congressional debate.

House representative Frank Wolf has by far had the strongest Congressional influence on Sino-US space cooperation, motivated by his view on China. As a 10 (non-consecutive) year chairman of the Appropriations subcommittee he has used his control over both NASA's and OSTP's budgets to make his mark.<sup>134</sup> Through his 2011 Wolf Amendment, all options for NASA and OSTP to engage with Chinese counterparts were effectively shut down, although contested for OSTP.<sup>135</sup> Still, the ban has persisted over the years and reduced effective space cooperation to some small scientific information sharing activities. These are only permitted because they are part of a multilateral effort not subject to the Wolf Amendment's bilateral restrictions. Repeatedly, Frank Wolf has stated his motivations for prohibiting bilateral cooperation via NASA and OSTP. These motivations boil down to two central points. First, he sees the Chinese government as major human rights violators and warmongers, presenting a critical threat to US values and interests. He is quoted by *Science* in 2011 as saying: "*And frankly, it boils down to a moral issue. ... Would you have a bilateral program with Stalin?*"<sup>136</sup> Just after the public release of the redacted version of the Cox report, Wolf compared trade with China to trade with Nazi Germany. During the same discussion, he also called China 'the evil empire', a phrase used by president Reagan to describe the USSR during the Cold War.<sup>137</sup> This depiction of the contemporary Chinese government as a fundamentally and completely evil entity and making comparisons with the most brutal and lethal regimes of human history is typical for proponents of the China threat theory. The condemnation is so absolute, that it also leaves no room for any cooperation or even minor engagement. Every Chinese action is malevolent, every Chinese entity

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<sup>134</sup> Dan Leone, 'Frank Wolf, House's Top NASA Appropriator, Retiring in 2015', *Spacenews*, 18 December 2013, <http://spacenews.com/38756frank-wolf-houses-top-nasa-appropriator-retiring-in-2015/>.

<sup>135</sup> Rogers, Department of Defense and Full-Year Continuing Appropriations Act, 2011, sec. 1340.

<sup>136</sup> Jeffrey Mervis, 'Spending Bill Prohibits U.S.-China Collaborations', *Science*, 21 April 2011, <http://www.sciencemag.org/news/2011/04/spending-bill-prohibits-us-china-collaborations>.

<sup>137</sup> Elizabeth Shogren, 'House OKs Extension of China Trade Ties', *Los Angeles Times*, 28 July 1999, <http://articles.latimes.com/1999/jul/28/news/mn-60260>.

state-controlled and suspect. During his years in Congress, Frank Wolf has also cosponsored several unsuccessful resolutions condemning China's human rights handling and supporting a full UN membership for Taiwan.<sup>138</sup> Wolf even stated that thinking of NGO's being able to work independently of the Chinese government is "*really naïve*", while these organisations are paramount importance in human rights advocacy.<sup>139</sup>

The second motivation for Wolf's opposition is the suspicion that the Chinese stood to gain massively from cooperation, combined with their aggressive espionage activities, while the reverse is considered not true. These gains would then allow China to further its military and economic progress, with the goal of overcoming the US. Any cooperation is one-sided in his view: "*We don't want to give them the opportunity to take advantage of our technology, and we have nothing to gain from dealing with them*".<sup>140</sup> While at the same time, Chinese assertiveness in espionage is clear: "*You name the company, and the Chinese are trying to get its secrets.*".<sup>141</sup> These comments also fit squarely into the China threat theory, where there is very little nuance and all engagement is seen as harmful to US interests. Representative Wolf has also acted several times on the fear for technology transfer through either cooperation or through espionage. He pressed the FBI for continued investigation into a possible ITAR violation, which he claimed was condoned by the leadership of NASA's Ames research centre.<sup>142</sup> After an anonymous tip he instructed NASA to start a sweeping security review, that while being highly disruptive, found no breaches.<sup>143</sup> Additionally, he testified before the House Foreign Affairs Subcommittee on Oversight and Investigations in 2011 during a hearing entitled: "*Efforts to transfer America's leading edge science to China*".<sup>144</sup> This hearing was presided over by Dana Rohrabacher, another House representative whose role will be discussed shortly. In the end, both the concern for human rights and fear of technology transfer have been written into the Wolf Amendment during Frank Wolf's chairmanship.

Representative John Culberson took over the chairmanship of the House Appropriations Subcommittee on Commerce, Justice, Science, and Related Agencies in 2015, after Frank Wolf's retirement, continuing in the same vein. After taking over, he commented on the Wolf Amendment and its motivations:

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<sup>138</sup> Ileana Ros-Lehtinen, 'Recognizing the Continued Persecution of Falun Gong Practitioners in China on the 11th Anniversary of the Chinese Communist Party Campaign to Suppress the Falun Gong Spiritual Movement and Calling for an Immediate End to the Campaign to Persecute, Intimidate, Imprison, and Torture Falun Gong Practitioners.', 16 March 2010, <https://www.congress.gov/bill/111th-congress/house-resolution/605>; Christopher Smith H., 'Urging the Government of the People's Republic of China to Respect the Freedom of Assembly, Expression, and Religion and All Fundamental Human Rights and the Rule of Law for All Its Citizens and to Stop Censoring Discussion of the 1989 Tiananmen Square Demonstrations and Their Violent Suppression.', 28 May 2014, <https://www.congress.gov/bill/113th-congress/house-resolution/599>; Gerald Solomon B., H., 'Relating to the Republic of China on Taiwan's Participation in the United Nations.', 5 October 1993, <https://www.congress.gov/bill/103rd-congress/house-concurrent-resolution/148>.

<sup>139</sup> Mervis, 'Spending Bill Prohibits U.S.-China Collaborations'.

<sup>140</sup> Mervis.

<sup>141</sup> Mervis.

<sup>142</sup> Frank Wolf R. and Lamar Smith, 8 February 2013, <http://images.spaceref.com/news/2013/mueller.ltr.pdf>.

<sup>143</sup> Rosenberg, 'This Congressman Kept the U.S. and China From Exploring Space Together'.

<sup>144</sup> Christopher Smith H. et al., 'Efforts to Transfer America's Leading Edge to China', Pub. L. No. 112-74, § Committee on Foreign Affairs (2011).

*“China’s Space program is owned and controlled entirely by the People’s Liberation Army and the Chinese government have proven to be the world’s most aggressive in cyber espionage. I intend to vigorously enforce the longstanding prohibitions designed to protect America’s space program.”*

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These words mirror those of Frank Wolf, both in focus and severity. Not surprising perhaps, as he had also called Wolf a *“hero of mine”*.<sup>146</sup> In 2015, the Chinese official news agency Xinhua used part of Culberson’s comments to contrast the more optimistic view of Charles Bolden (the then NASA administrator) regarding space cooperation with China.<sup>147</sup> While no qualifiers were used or judgement was expressed, it shows that the Chinese are acutely aware of this kind of Congressional sentiment. Also long before his chairmanship, Culberson already used clear China threat language when discussing scientific cooperation at a science luncheon in Houston:

*“A concern that I continue to see is that a lot of those scientists from communist China, my impression is, and correct me if I am wrong, come here and learn as much as they can, and then leave. And I’m not really all that much into helping the communists figure out how to better target their intercontinental ballistic missiles at the United States. They basically steal our technology for military applications. And they are red China, let’s not forget.”* [sic]<sup>148</sup>

Culberson’s taking over the chairmanship has ensured that Frank Wolf’s legacy of distrust and aversion towards China continues in the House Appropriations subcommittee even after Wolf’s retirement.

Representative Dana Rohrabacher has similar concerns about China and used his positions in two House committees to portray engagement with China as dangerous and exert pressure on US officials to reduce cooperation. His own campaign website claims that because of his efforts, the Cox report provided recommendations to prevent technology transfer to China. This conviction became apparent again in 2012, when he wrote to Secretary of State Hillary Clinton to prevent the granting of an export licence for a commercial satellite transaction.<sup>149</sup> Rohrabacher’s devotion to space is can be seen in his 28 year service on the subcommittee on space of the House Committee on Science, Space, and Technology, and from his chairmanship of this subcommittee

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<sup>145</sup> Marcia Smith, ‘Culberson Will “vigorously Enforce” Restrictions on NASA-China Relationship - Updated’, *Space Policy*, 26 October 2015, <https://spacepolicyonline.com/news/culberson-will-vigorously-enforce-restrictions-on-nasa-china-relationship/>.

<sup>146</sup> Dan Leone, ‘NASA Spending Panel Chairman Keeps Focus on China’, *Spacenews*, 25 February 2015, <http://spacenews.com/nasa-spending-panel-chairman-keeps-focus-on-china/>.

<sup>147</sup> Yan, ‘U.S. Space Agency Chief “Optimistic” about Space Cooperation with China’, *Xinhua*, 29 October 2015, [http://www.xinhuanet.com/english/2015-10/29/c\\_134760191.htm](http://www.xinhuanet.com/english/2015-10/29/c_134760191.htm).

<sup>148</sup> Eric Berger, ‘Do Most Chinese Students Come Here to Steal Secrets?’, *Houston Chronicle*, 21 August 2008, <https://blog.chron.com/sciguy/2008/08/do-most-chinese-students-come-here-to-steal-secrets/>.

<sup>149</sup> ‘Obama Administration to Sell Restricted Military Technology to Communist China’, 3 August 2012, <https://rohrabacher.house.gov/press-release/press-releaseobama-administration-sell-restricted-military-technology-communist-china>.

from 1997 to 2005.<sup>150</sup> He also raised the issue of China and space in his role as chairman of the House Foreign Affairs Subcommittee on Oversight and Investigation, when he presided over a hearing entitled *“Efforts to Transfer America’s Leading Edge Science to China”* in November 2011. The hearing’s main purpose was to investigate and criticise the visits of NASA administrator Bolden and OSTP director Holdren to China, in the context of the Wolf Amendment prohibitions. His opening statement set the tone:

*“When personnel from either of these organizations travel to the People’s Republic of China, collaborate on projects, share data or attend conferences, yes, there is ample reason for concern. The transfer of technology know-how is a serious national security problem. The Chinese communist party is aggressively using its military, economic and political power to extend its influence and diminish ours. Its government is the world’s single largest human rights abuser,”*<sup>151</sup>

Clearly, representative Rohrabacher employs China threat language by continuously referring to China as ‘red’ or ‘communist’ and a flagrant violator of human rights, and proceeds to use these qualifications to oppose any and all cooperation or engagement in the area of space.

Representative Lamar Smith has been highly critical of China as well, with focus on the transfer of technology and knowledge from the US to China via various -mostly illicit- ways. In 2011 he became the vice-chairman of the subcommittee on space, and in 2013 the chairman of the full committee on science, space, and technology.<sup>152</sup> It is in this capacity that he jointly wrote a letter with Frank Wolf, pressing the FBI director to investigate NASA for possible deliberate technology transfer to China.<sup>153</sup> During Babin’s hearing ‘Are we losing the space race to China?’, Smith referred to China’s ASAT tests and China’s *“blatant disregard for international rule of law”* in the South China Sea, rhetorically asking if this conduct would extend into outer space.<sup>154</sup> His strong suspicion and condemnation of perceived Chinese actions also became apparent in the April 11, 2018 hearing of his committee entitled: ‘Scholars or Spies: Foreign Plots Targeting America’s Research and Development’.<sup>155</sup> His statement leaves little to the imagination regarding his opinion on possibilities for even purely scientific cooperation:

*“The Chinese government has been very clear about its long range plans for achieving global domination in critical areas of science and technology. China, however, has been less forthright about its methods, which include theft of confidential information and technological secrets from*

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<sup>150</sup> ‘Committees and Caucuses, House Committee on Foreign Affairs’, Congressman Dana Rohrabacher, accessed 30 June 2018, <https://rohrbacher.house.gov/legislation/committees-and-caucuses>.

<sup>151</sup> Smith et al., *Efforts to Transfer America’s Leading Edge to China*.

<sup>152</sup> ‘Smith Named Vice Chair of Space Subcommittee’, Congressman Lamar Smith, 4 May 2011, <https://lamarsmith.house.gov/media-center/in-the-news/smith-named-vice-chair-of-space-subcommittee>; ‘Committees’, Congressman Lamar Smith, accessed 30 June 2018, <https://lamarsmith.house.gov/about/committees-and-caucuses>.

<sup>153</sup> Wolf and Smith, 8 February 2013.

<sup>154</sup> Lamar Smith et al., ‘Are We Losing the Space Race to China?’, Pub. L. No. 114–95, § Subcommittee on Space (2016), 12.

<sup>155</sup> Lamar Smith, ‘Statement by Chairman Lamar Smith (R-Texas) (Committee on Science, Space and Technology, 11 April 2018), <https://docs.house.gov/meetings/SY/SY21/20180411/108175/HHRG-115-SY21-MState-S000583-20180411.pdf>.

*U.S. companies, cyber-attacks and other forms of spying to undermine our national security and putting sleeper agents at our research universities to steal our scientific breakthroughs.”*<sup>156</sup>

Calling China’s strategic goal ‘domination’ and asserting the existence of university ‘sleeper agents’ fits in with the China threat theory, although it is less rooted in notions of human rights and opposition to communism prevalent in the traditional China threat language.

Representative Brian Babin is a successor of Dana Rohrabacher as chairman of the Science Subcommittee on Space since 2015, returning the anti-China focus to the subcommittee’s agenda. Exemplary is the September 2016 hearing he presided over, entitled “*Are We Losing the Space Race to China?*”<sup>157</sup> Curiously, in his opening remarks, Babin already called into question the existence of a space race with China or even space competition with China.<sup>158</sup> This hearing was less concerned with technology transfer and far more with the strategic initiative and leadership the US was possibly or supposedly losing to China. It considered the role of other space-faring states, who have a choice in cooperating with the US, China, or both. By letting China get the upper hand in international space cooperation the US would also conceivably lose influence and, according to Babin, also soft power. In his opening statement, representative Babin put it as follows:

*“If we do not lead, we will not set the terms and condition for those who follow. When the U.S. explores and embarks on adventures of discovery, we take with us our ideologies and principles. I, for one, want to ensure that space becomes a domain of freedom and liberty, not autocracy and oppression. If we do not lead, we will weaken our partnerships. I want countries to embark with us into the cosmos, rather than team with China as a last resort.”*<sup>159</sup>

While Babin does criticise China for being oppressive, he does not use human rights as a reason to oppose all engagement and cooperation, instead giving Chinese provocation regarding ASAT tests and the South China Sea as reason for being hesitant about cooperation. By tying cooperation in space to a larger strategic narrative instead of human rights conditions, cooperation becomes an option, although not a likely one. This is reflected towards the end of this opening statement:

*“Furthermore, we should ensure that any U.S. cooperation with China in space is mutually beneficial, appreciates the risk of technology exploitation, and fits into a larger strategic perspective that recognizes Chinese provocation.”*<sup>160</sup>

This one sentence, combined with omitting ‘red’ or ‘communist’ as standard prefix when referring to China, strongly indicate that Babin represents a new direction of attitude towards China in the

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<sup>156</sup> Smith.

<sup>157</sup> Smith et al., *Are We Losing the Space Race to China?*

<sup>158</sup> Brian Babin, ‘Statement of Space Subcommittee Chairman Brian Babin (R-Texas)’ (Committee on Science, Space and Technology, 27 September 2016), <https://docs.house.gov/meetings/SY/SY16/20160927/105387/HHRG-114-SY16-MState-B001291-20160927.pdf>.

<sup>159</sup> Babin,.

<sup>160</sup> Babin,.

subcommittee relevant for space cooperation. In the hearing and in other statements of representative Babin, it appears that while he is quite cautious when it comes to China, he is not a proponent of the China threat theory.

Many witnesses participate in Congressional hearings related to China's space program, amongst which Richard Fisher stands out in his use of China threat language. He is a senior fellow at the International Assessment and Strategy Center, which is noted for its pro-Taiwan views. Fisher himself also advocated the transfer of offensive US military material to Taiwan, in direct contradiction to longstanding Sino-US management of the US-Taiwan and cross-strait relations.<sup>161</sup> On the Shanghai Cooperation Organisation, a strategic dialogue platform of China, Russia, India and central Asian states, Fisher commented during a House hearing: "*The SCO Charter opposes 'extremism,' a code word for democracy*"; indicating his deep suspicion of Chinese motives.<sup>162</sup> Particularly regarding possible cooperation on areas related to the military and space, Fishers aversion to cooperation and fear of Chinese intentions is clear. The legacy of this conviction can be traced back to his position as senior analyst for the Cox Report committee.<sup>163</sup> During the "*Efforts to transfer America's leading edge science to China*" hearing presided over by Dana Rohrabacher, he submitted a lengthy written testimony containing the following regarding Sino-US space cooperation:

*"It is highly questionable whether the United States and the PRC can find a basis for cooperation in space that would then cause a fundamentally positive change to their relations here on Earth. As with the former Soviet Union, any real change in PRC relations with the U.S. will depend far more on a transformation away from the current Communist Party dictatorship and its military guarantors toward an open, accountable democratic system. The PRC Party-Military amalgam depends on domestic repression and recurrent reference to so-called external threats to remain in power. In fact, we see each of these escalating dangerously recently, leading to notable expressions of concern from its neighbors, this Congress, and indeed this Administration. In such a context there is little NASA can do to effect positive change -- whilst conversely, it could do a great deal of harm to U.S. interests if it were to continue to enable the PRC to extract one-sided advantage from U.S. science and space technologies."*<sup>164</sup>

His clear use of China threat language and opposition to engagement while favouring regime change are matched by his vague assertions of Chinese military developments and plans. In the same testimony, he provided the House Foreign Affairs Subcommittee on Oversight and Investigations with a table on the scientific and military aspects of the Shenzhou and Tiangong projects. The "*Military Mission Highlights*" column filled out for all missions featured little more than camera's, cargo spaces that could be used for delivering military equipment, and the quite daring and vague statement that the Tiangong space station "*could also be configured for space*

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<sup>161</sup> Matthew Strong, 'U.S. Ban on Offensive Weapons for Taiwan No Longer Realistic: U.S. Expert', *Taiwan News*, 6 April 2018, <https://www.taiwannews.com.tw/en/news/3399407>.

<sup>162</sup> Richard Fisher D. Jr., 'China's Global Military Power Projection Challenge to the United States' (Office of the Clerk, 17 May 2018), 4, <https://docs.house.gov/meetings/IG/IG00/20180517/108298/HHRG-115-IG00-Wstate-FisherR-20180517.pdf>.

<sup>163</sup> 'Richard Fisher', Global Taiwan Institute, accessed 30 June 2018, <http://globaltaiwan.org/richard-fisher/>.

<sup>164</sup> Smith et al., *Efforts to Transfer America's Leading Edge to China*, 74.

*combat missions*".<sup>165</sup> Fisher also claimed in Congressional testimony that the PLA has held a conference about the militarisation of the moon.<sup>166</sup> This kind of third hand, completely unconfirmed information in an unclassified setting can have little other purpose than to create aversion to China. By inviting Richard Fisher, the subcommittee chaired by Rohrabacher has moved towards increased Congressional acceptance of the China threat theory; severely damaging prospects for engagement, cooperation and trust-building.

Crucial to note in regard to China threat theory is that it is not a comprehensive strategic reaction to the emergence of China as the main competitor for the US on the world stage. In response to the increasing power of China and the challenge it poses to the US-led world order, several reactions are possible. One is to try to pull China into the US-led order, allowing it a place equivalent with its power and influence in the US institutions like the WTO and World Bank and engage it through trust building exercises and treaties. Another is to try to slow down Chinese re-emergence both economically and militarily, oppose its increasing influence in Asia as well as other regions and build a coalition against -instead of incorporating- China. While the second strategic approach is a valid one, this is not what China threat theory is building towards. Proponents of China threat theory use specific moral and ideological vault lines to attack and isolate China on very specific, isolated and unrelated matters. Oppression of religious minorities? No more scientific cooperation in space. Using inflammatory rhetoric (comparisons to Stalin or Nazi Germany) and moral outrage, the measures are passed even though they are not connected to other pieces of legislation on China and do not address the reasons for the outrage. This entails that the actions of China threat theory proponents do not fit into *any* comprehensive strategic reaction to the enormously complicated challenge China's re-emergence presents for the US.

### 3. PRESIDENTIAL LEADERSHIP

While several US Representatives have advocated China threat theory and vigorously opposed engagement and cooperation there have also been US efforts to increase Sino-US cooperation, mostly originating from the offices of the president. This has led Sagar Reddy to assert that Sino-US space cooperation is a "*balancing act between the U.S. Congress and the president*".<sup>167</sup> Although this does seem to hold true, the partisan dynamics of US politics also heavily influence this area of policy. For president Clinton, tensions related to the Tiananmen square incident and satellite technology transfers prevented a cooperative approach, even if there was intent in this direction. During the first years of the Bush administration, this seemed to continue. However, from 2004 to the end of the Obama presidency in 2016, cooperation initiatives have originated from the two administrations, albeit to a different extent and in a changing context influenced by Congressional and Chinese action.

After the silence of the Bush administration on the subject of space and China from 2001 onwards, mixed signals began to emerge starting in 2004. In December of 2004, the head of CNSA, Laiyan Sun, was invited to meet with NASA administrator O'Keefe. Although no discussion on cooperation was on the agenda and the meeting was considered a 'courtesy call', it represented the first open high-level intergovernmental contact on space between the US and

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<sup>165</sup> Smith et al., 72.

<sup>166</sup> Fisher, 'China's Global Military Power Projection Challenge to the United States', 4-5.

<sup>167</sup> Reddy, 'U.S.-China Space Cooperation'.

China since the discussion of the Carter-era S&T agreement.<sup>168</sup> This step was especially meaningful after Bush's new 'Vision for Space Exploration' for NASA, which had been revealed in January of that same year. Commenting on the 'international exploration workshop' of November 2004, which was part of the new Vision and saw Chinese attendance, O'Keefe stated: "*The Bush Administration now believes that 'measured and appropriate levels of space cooperation with China' are viable,*".<sup>169</sup> Speculation was rife that China might be included in the Bush Vision for Space Exploration. This expectation however, did not materialize.<sup>170</sup> A NASA spokeswoman indicated before Sun's visit that the Bush administration linked a change in Chinese proliferation activities to the possibility of civil space cooperation with China.<sup>171</sup> In contrast with the promising visit, the Bush administration published a new US Space Policy in 2006 that had a far more assertive tone. Even though its first stated 'principle' is the use of space for 'peaceful purposes' and the third international cooperation for these 'peaceful purposes', principle five of the Bush Space Policy is unprecedentedly unilateral and aggressive:

*"The United States considers space capabilities [...] vital to its national interests. Consistent with this policy, the United States will: preserve its rights, capabilities, and freedom of action in space; dissuade or deter others from either impeding those rights or developing capabilities intended to do so; take those actions necessary to protect its space capabilities; respond to interference; and deny, if necessary, adversaries the use of space capabilities hostile to U.S. national interests;"*<sup>172</sup>

In addition, principle six even declares the US opposition to development of "*new legal regimes or other restrictions that seek to prohibit or limit U.S. access to or use of space*".<sup>173</sup> The effects of this principle had been seen earlier, when in October 2005 the US voted against the Resolution 'Prevention of an arms race in outer space' in the UN General Assembly.<sup>174</sup> Most remarkable, as the US was the only state to vote against and Israel the only to abstain, while 160 states voted in favour.<sup>175</sup> This unilateral and assertive stance by Bush combined with US army doctrine incorporating space forces as a central force multiplier since the late 1990's resulted in an increasingly threatening strategic space environment for China.

Despite the openly unilateral and aggressive stance of the Bush administration on space, some steps were taken to keep the dialogue on space open both by the US government and Congress. In the same year as the publishing of the Bush Space Policy, the Air Force Academy's 'Eisenhower

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<sup>168</sup> Craig Covault, 'The China Card: U.S. Now Agreeable to Space Cooperation with China', *Aviation Week and Space Technology*, 31 January 2005.

<sup>169</sup> Covault.

<sup>170</sup> Marcia Smith S., 'China's Space Program: An Overview', CRS Report for Congress (Congressional Research Service, 18 October 2005), <https://fas.org/sgp/crs/space/RS21641.pdf>.

<sup>171</sup> 'US, China Space Agency Chiefs Hold Talks amid Proliferation Concerns', *Space Daily*, 3 December 2004, <http://www.spacedaily.com/2004/041203021513.2eh2o62l.html>.

<sup>172</sup> 'U.S. National Space Policy' (NASA, 31 August 2006), [https://history.nasa.gov/ostp\\_space\\_policy06.pdf](https://history.nasa.gov/ostp_space_policy06.pdf).

<sup>173</sup> 'U.S. National Space Policy'.

<sup>174</sup> 'Prevention of an Arms Race in Outer Space' (First Committee, 12 October 2005), [https://gafc-vote.un.org/UNODA/vote.nsf/d523afe92781d4d605256705006e0a5d/9fa2433925d007bd852570a10049fce6/\\$FILE/A-C.1-60-L27.pdf](https://gafc-vote.un.org/UNODA/vote.nsf/d523afe92781d4d605256705006e0a5d/9fa2433925d007bd852570a10049fce6/$FILE/A-C.1-60-L27.pdf).

<sup>175</sup> 'Prevention of Outer Space Arms Race, Mediterranean Security Among Issues, as Disarmament Committee Approves Seven More Texts' (First Committee, 25 October 2005), <https://www.un.org/press/en/2005/gadis3310.doc.htm>.

Center for Space and Defense Studies' started a series of 'China, Space, and Strategy workshops' that saw attendance from US and Chinese governmental, academic and think tank experts. In a review of the workshops, Edigar Sadeh (assistant director of the Eisenhower Center) expressed that misunderstanding was central to the relationship between the US and China on space, as it still likely is. Such misunderstanding is fed, according to the author, by the assertive US stance, a general lack of comprehensive "*strategic concepts of space*", inaccurate translations of strategic concepts, US abandonment of the Anti-Ballistic Missile treaty, China's intertwined civil-military space efforts, Chinese sensitivity over Taiwan and the opaque nature of China's bureaucracy.<sup>176</sup> The workshops may have contributed to an exchange of knowledge on perceptions and developments, yet it was recognised that real progress on strategic matter could only be made in an official high-level inter-governmental dialogue.

Signs of a possible governmental dialogue emerged in the same year as the Bush Space Policy, likely in an attempt to reduce the impact of the new Space Policy's adversarial tone. In January 2006 three Congressmen from the U.S. Congress' China Working Group visited the Jiuquan Satellite Launch Centre. During this unprecedented visit, representative Tom Feeney expressed support for increased Sino-US space cooperation in spaceflight, while also recognising the "*very legitimate concerns*" of the US military.<sup>177</sup> In April, CNSA Vice Administrator Luo Ge, visited the US and held presentations at the Center for Strategic & International Studies (CSIS) thinktank and the National Space Symposium. A reciprocal and ground-breaking visit of NASA administrator Griffin was also agreed to during the visit.<sup>178</sup> In September, Griffin went to China on what was repeatedly emphasised to be an 'exploratory visit'. Still, the first NASA administrator to visit China saw options for the deepening of the Sino-US relationship in and by the field of spaceflight: "*cooperation in space is one of those things that I think we can look forward to being a unifying force*".<sup>179</sup> Even though the first visit of a NASA administrator was a step towards cooperation, this only reflected a consideration by the administration of limited civil space engagement with China. Griffin's 2006 visit was one small step forwards, but far from able to address the core strategic mistrust that would be expanded dramatically by China's destructive ASAT only four months later, which prevented continuation on the path of engagement for some time.

The giant leap for cooperation came in 2009, when the new Obama administration made science and technology cooperation in general and space cooperation in particular a prominent part of its vision on the Sino-US relationship. In the U.S.-China Joint Statement released during Obama's visit to China in November 2009, both countries praised the establishment of the general high-level 'U.S.-China Strategic and Economic Dialogue' and supported the expansion of science and technology cooperation under the 1979 'U.S.-China Agreement on Cooperation in Science and Technology'. To this end, the new 'U.S.-China Joint Commission on Science and Technology Cooperation' was established. A specific commitment to cooperation in space science and dialogues on human space flight and space exploration was announced as well, on the condition of

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<sup>176</sup> Sadeh, 'Report: United States-China Space Dialogue Project'.

<sup>177</sup> Leonard David, 'U.S.-China Cooperation: The Great Space Debate', *Space.Com*, 12 April 2006, <https://www.space.com/2284-china-cooperation-great-space-debate.html>.

<sup>178</sup> Lon Rains, 'NASA Chief Michael Griffin Invited to China', *Space.Com*, 5 April 2006, <https://www.space.com/2255-nasa-chief-michael-griffin-invited-china.html>.

<sup>179</sup> Michael Griffin et al., 'Administrator Griffin Visits China' (Press Conference, Beijing, China, 25 September 2006), 15, [https://www.nasa.gov/pdf/159204main\\_Griffin\\_China\\_roundtable\\_9-25.pdf](https://www.nasa.gov/pdf/159204main_Griffin_China_roundtable_9-25.pdf).

*“transparency, reciprocity and mutual benefit”*.<sup>180</sup> Along those lines, U.S. Geological Service (USGS) cooperation with China was expanded to include data from US Earth observation satellite Landsat 8.<sup>181</sup> With the prospect of future space cooperation and increased high-level dialogue including the space agencies, Sino-US space relations seemed to be moving towards engagement during the Obama era.

Efforts by the Obama administration to increase strategic engagement and cooperation with China on space were stymied by Republicans gaining control over the House of Representatives in the 112<sup>th</sup> Congress. The effect of Republican control over the House on Obama’s China space policy can already be seen in the January 2011 U.S.-China Joint Statement, released only sixteen days after the start of the 112<sup>th</sup> Congress. Language concerning space cooperation evolved from the 2009 Joint Statement description of *“discussions on space science cooperation and starting a dialogue on human space flight and space exploration”* to *“discussions on opportunities for practical future cooperation in the space arena,”*<sup>182</sup> Presumably resulting from Chinese disappointment over a lack of cooperative space projects after 2009, the qualifier ‘practical’ was inserted. Yet, to not antagonise the generally more hawkish Republican majority in the House, ‘human space flight and space exploration’ was reduced to the more non-descript ‘space arena’. This allowed the ‘practical [...] cooperation’ to possibly be limited to mere joint space debris tracking. The Republican-led house did indeed clamp down on Sino-US space engagement, with the Wolf Amendment passing in April 2011, and OSTP Director John Holdren and NASA Administrator Charles Bolden being called to witness alongside China threat theorists Frank Wolf and Rick Fisher. During this November 2011 hearing with the ominous title ‘Efforts to transfer America’s Leading Edge to China’, Holdren explained the reasoning of the Obama Administration on general scientific and technological engagement with China:

*“we believe U.S.-China science and technology cooperation in forms that benefit both countries strengthens our hand in the effort to get China to change the aspects of its conduct that we oppose”*<sup>183</sup>

Due to this Congressional pressure and limitation, Landsat 8 turned out to be the only tangible space cooperation with China until 2016. With the Republicans gaining control of the House in 2011 and the China threat theorists in their midst occupying crucial committee positions, the Obama administration had to significantly downgrade aspirations for Sino-US space cooperation.

Despite the Republican controlled Congress limiting the options for the Obama administration to engage China in space cooperation, it remained high on the bilateral agenda. In June 2015, the Seventh Round of the U.S.-China Strategic and Economic Dialogue also encompassed discussion of space security alongside related topics military to military relations,

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<sup>180</sup> ‘China-US Joint Statement 2009’.

<sup>181</sup> Richard Stuttmeyer P., ‘Trends in U.S.-China Science and Technology Cooperation: Collaborative Knowledge Production for the Twenty-First Century?’ (Research Report Prepared on Behalf of the U.S.-China Economic and Security Review Commission, 11 September 2014), 24–25, <https://www.uscc.gov/sites/default/files/Research/Trends%20in%20US-China%20Science%20and%20Technology%20Cooperation.pdf>.

<sup>182</sup> ‘China-US Joint Statement 2009’; ‘U.S. - China Joint Statement 2011’.

<sup>183</sup> Smith et al., Efforts to Transfer America’s Leading Edge to China, 35.

missile defence and nuclear policy. During these talks, space was still only considered as a military issue (as far as reported).<sup>184</sup> One of the outcomes however, was the establishment of a separate official US-China Civil Space Cooperation Dialogue, co-chaired by the US Department of State and the CNSA in September 2015.<sup>185</sup> Chinese officials from the Ministry of Foreign Affairs also participated, but by placing NASA and OSTP in an supporting role to the State Department on the US side, the meeting would fly less in the face of the Wolf Amendment. Still, proper Congressional certification was needed and requested, although chairman Culberson later stated that the information supplied by NASA was too vague.<sup>186</sup> It seems that OSTP had not requested certification, in line with the Department of Justice opinion declaring the restrictions on OSTP by the Wolf Amendment unconstitutional. During the first US-China Civil Space Cooperation Dialogue, only cooperation on “*Earth observation activities, space sciences, space weather, and civil Global Navigation Satellite Systems (GNSS)*” was discussed.<sup>187</sup> Striking for a ‘civil’ dialogue platform is that next to several US scientific agencies, officials from the US Department of Defense also attended. This was not the case on the Chinese side.<sup>188</sup> The newly established dialogue platform represented a clear action by the Obama administration towards institutionalisation of broad US engagement of China on space.

The US-China Civil Space Cooperation Dialogue was further broadened in scope in the two following dialogue meetings by the Obama administration. Topics added in the second meeting in October, 2016 included “*space debris and spaceflight safety; and the long-term sustainability of outer space activities.*”<sup>189</sup> More importantly, both sides also exchanged information on space policies and programs. Communication in this manner on current policy and programs is essential in increasing strategic bilateral trust. The sensitivity of this kind of engagement was not lost on the US administration, as the second meeting was announced only shortly before it was held, with little details given, and no press inquiries answered.<sup>190</sup> A US State Department official stated that during the Third Civil Space Dialogue held in November, 2017;

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<sup>184</sup> ‘Background Briefing on the U.S.-China Strategic and Economic Dialogue’, 22 June 2015, <https://2009-2017.state.gov/r/pa/prs/ps/2015/06/244085.htm>.

<sup>185</sup> ‘The First Meeting of the U.S.-China Space Dialogue’ (Office of the Spokesperson, 28 September 2015), <https://uk.usembassy.gov/china112/>.

<sup>186</sup> Charles Bolden F. Jr., 31 July 2015,

<https://spacepolicyonline.com/pages/images/stories/NASA%20ltrs%20to%20Culberson%20re%20China.pdf>; Marcia Smith, ‘Culberson Insists NASA Did Not Comply With Law Prior to China Meeting’, *Spacepolicyonline.Com*, 11 December 2015, <https://spacepolicyonline.com/news/culberson-insists-nasa-did-not-comply-with-law-prior-to-china-meeting/>.

<sup>187</sup> ‘The First Meeting of the U.S.-China Space Dialogue’.

<sup>188</sup> Bolden, 31 July 2015.

<sup>189</sup> ‘The Second Meeting of the U.S.-China Space Dialogue’ (Office of the Spokesperson, 24 October 2016), <https://2009-2017.state.gov/r/pa/prs/ps/2016/10/263499.htm>.

<sup>190</sup> Li Boa, ‘US, China Silent on Space Talks, Except to Say There Will Be More’, *VOA News*, 25 October 2016, <https://www.voanews.com/a/us-china-to-continue-civil-space-exploration-talks/3566037.html>; Andrew Jones, ‘United States, China Hold Space Dialogue, Working around Congressional Barriers’, *GBtimes*, 25 October 2016, <https://gbtimes.com/united-states-china-hold-space-dialogue-working-around-congressional-barriers>.

*“the delegations discussed ways to improve bilateral cooperation on spaceflight safety issues and shared their respective plans for human and robotic space exploration, and support for commercial space activities.”*<sup>191</sup>

Together with new discussions on *“constructively engaging in space-related multilateral mechanisms,”* (engagement that would not be subject to Wolf Amendment restrictions), this again signalled a broadening scope of discussions.<sup>192</sup> In addition to these developments, a ‘Space Security Exchange’ was held in May 2016 by the US and China. It was announced as an outcome of the seventh round of the U.S.-China Strategic & Economic Dialogue’s Strategic Track in June 2015 with no details on the subjects of discussion.<sup>193</sup> In a fact sheet of the September 2016 bilateral meeting between president Obama and president Xi it was revealed to revolve around the issue of orbital debris.<sup>194</sup> Yet in the outcomes of the eighth round of the U.S.-China Strategic and Economic Dialogue held in June 2016, the Space Security Exchange was said to have been *“an in-depth exchange of views on a wide range of bilateral and multilateral space security issues, including orbital debris”*.<sup>195</sup> The scope seems to have been far broader than concern about orbital debris, as the document also states:

*“The two sides are committed to working toward the same objective through intensified bilateral and multilateral cooperation to promote international space security; expanding consensus and exploring appropriate confidence building measures in this regard; and enhancing mutual trust.”*

<sup>196</sup>

Additionally, orbital debris and satellite collision avoidance were also mentioned under the heading of the Civil Space Dialogue, indicating that the focus of the Space Security Exchange was more about consensus, confidence building measures and mutual trust. Through the Dialogue and Exchange platforms, the Obama administration has managed to greatly increase engagement with China on space related issues.

#### 4. CONFLICTING MOTIVATIONS

The US exclusionist policy is not a monolithic component of a strategic reaction to China’s increased aptitude in space, but a result of multiple constituencies and actors trying to shape Sino-

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<sup>191</sup> Andrew Jones, ‘China and US Quietly Hold Third Civil Space Dialogue, Discuss Exploration Plans and Cooperation’, *GBtimes*, 11 December 2017, <https://gbtimes.com/china-and-us-quietly-hold-third-civil-space-dialogue-discuss-exploration-plans-and-cooperation>.

<sup>192</sup> Jones.

<sup>193</sup> ‘U.S.-China Strategic & Economic Dialogue Outcomes of the Strategic Track’ (Office of the Spokesperson, 24 June 2015), <https://2009-2017.state.gov/r/pa/prs/ps/2015/06/244205.htm>.

<sup>194</sup> ‘U.S. Fact Sheet for President Obama’s Bilateral Meeting with President Xi Jinping’ (Office of the Press Secretary, 3 September 2016),

<https://www.amchamchina.org/uploads/media/default/0001/05/1fb6070d4b3be3656b86589ba2d123d48466787c.pdf>.

<sup>195</sup> ‘U.S.-China Strategic & Economic Dialogue Outcomes of the Strategic Track’ (Office of the Spokesperson, 7 June 2016), <https://2009-2017.state.gov/r/pa/prs/ps/2016/06/258146.htm>.

<sup>196</sup> ‘U.S.-China Strategic & Economic Dialogue Outcomes of the Strategic Track’.

US space relations. Relative influence of these groups and actors can be traced through the changes in US policy on cooperation with China in space. Businesses in the US were proponents for a more open relationship, allowing them to export products and utilize Chinese launch services. Even though regulations to prevent technology transfer were in place, U.S. companies had an obvious incentive to encourage the Chinese to pinpoint and remedy design and manufacturing flaws in the launch vehicles, since further catastrophic failures would have jeopardized their own success.<sup>197</sup> With the watershed of the 1999 Cox Report on this topic, the balance shifted towards the influence of China threat theorists in Congress. The US space launch industry had already been hurt by the Tiananmen square sanctions, with China doubling their amount of orbital launches for international customers from 1985-1990 to 1991-1995, while the US share in commercial launches declined significantly.<sup>198</sup> After the publishing of the Cox Report, even tougher restrictions were placed on all commercial space interactions with China. In the 1998 Strom Thurmond NDAA (PL105-261), the prevailing opinion of the US Congress was clearly stated: *“It is the sense of Congress that— (1) United States business interests must not be placed above United States national security interests”*.<sup>199</sup>

After 1999 it became clear that the opinion on the direction of Sino-US space relations is split along partisan lines, with strong influence from China threat theorists in the Republican party. Cooperation during the Bush Jr. administrations was at a low point, and Congress did not significantly challenge the direction set by the president. Only when space engagement of China made a comeback under Obama, did the Republicans in the House start to push back under the leadership of Frank Wolf. Democrats such as Eddie Bernice Johnson and Donna Edwards (ranking members on the Committee on Science, Space and Technology and the Subcommittee on Space, respectively) were far more open to possible Sino-US cooperation.<sup>200</sup> NASA’s own policy on international cooperation since 1999 has been as follows:

*“NASA encourages mutually beneficial foreign participation in its programs, projects, and activities when such participation is appropriate and significantly enhances technical, scientific, economic, or foreign policy benefits.”*<sup>201</sup>

The specific mentioning of foreign policy benefits indicates the acknowledgement by the US that their space program is also used as a strategic tool, in addition to its domestic benefits. Still, NASA had no reported S&T cooperation with China during 2010-2015.<sup>202</sup> Only in 2016, exchange of

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<sup>197</sup> Pollack, ‘The Cox Report’s “Dirty Little Secret”’.

<sup>198</sup> ‘Launch Record’, China Great Wall Industry Corporation, 20 May 2018, <http://www.cgwic.com/Launchservice/LaunchRecord.html>.

<sup>199</sup> Spence, Strom Thurmond National Defense Authorization Act for Fiscal Year 1999, sec. 1511.

<sup>200</sup> Smith et al., Are We Losing the Space Race to China?

<sup>201</sup> ‘Initiation and Development of International Cooperation in Space and Aeronautics Programs (Revalidated 8/28/2014)’ (NASA Office of International and Interagency Relations, 16 April 1999), <https://nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPD&c=1360&s=2B>.

<sup>202</sup> ‘United States - China Science and Technology Cooperation’, Biennial Report to the U.S. – China Economic & Security Review Commission (Bureau of Oceans & International Environmental & Scientific Affairs, July 2012), <https://2009-2017.state.gov/documents/organization/197119.pdf>; Samuel Smith, ‘Implementation of Agreement between the United States and China on Science and Technology Public

“respective lunar science mission information” and involvement in space geodesy, Earth observation and air traffic management research were reported.<sup>203</sup> These are not so much cooperative programs, as basic data sharing agreements. As multilateral cooperation is not prohibited, NASA does take part alongside Chinese agencies in the International Space Exploration Coordination Group (ISECG), Committee on Earth Observing Satellites, and the United Nations Committee of the Peaceful Uses of Outer Space (UN COPOUS).<sup>204</sup> A clear majority of academics also advocates for increasing Sino-US dialogue and cooperation in the broad area of space. One of the most prominent specialists on the subject, Dr. Joan Johnson-Freese even provided a detailed rebuttal of why Frank Wolf is wrong about the direction to take.<sup>205</sup> One of the chief opponents of increased is Dean Cheng, B.A., a Senior Research Fellow of the Heritage Foundation. In line with the partisan divide on the issue, he felt compelled to defend the sources informing his position:

*“And just to clarify. I come from the Heritage Foundation, a noted right wing conservative organization. Brian Weeden works with the Secure World Foundation, a much more liberal entity. So this is not the right citing the right. [Laughter.]”<sup>206</sup>*

The scientists who would actually put potential cooperation programs into practice, are mostly neutral on the subject and do not make themselves heard on a political level. One possible exception is the US based Space Foundation, with the mission *“to inspire, educate, connect, and advocate on behalf of the global space community”*.<sup>207</sup> The Space Foundation has contact with the China Society of Astronautics and the China Space Foundation, and is openly advocating for increased cooperation.<sup>208</sup> For most space scientists in the US the NASA Administrator is their political representative, who while neutral, is bound by the directives of the administration.

With the inauguration of Donald Trump in 2017, a strong suspicion of Chinese space intentions returned to US policy.<sup>209</sup> In addition to the Trump administration’s suspicion and the still active Wolf Amendment, the neutrality of NASA itself has come under significant pressure with the appointment of Jim Bridenstine as NASA administrator.<sup>210</sup> Ever since its foundation by

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Law 107-314’ (U.S. Department of State, 11 May 2017), <https://fas.org/irp/world/china/docs/scitech-2016.pdf>.

<sup>203</sup> ‘NASA’s International Partnerships, Capabilities, Benefits and Challenges’ (NASA Office of Inspector General, 5 May 2016), <https://www.oversight.gov/sites/default/files/oig-reports/IG-16-020.pdf>.

<sup>204</sup> ‘NASA’s International Partnerships, Capabilities, Benefits and Challenges’.

<sup>205</sup> Joan Johnson-Freese, ‘China’s Space & Counterspace Programs’, § U.S.-China Economic & Security Review Commission (2015), [https://www.uscc.gov/sites/default/files/Johnson%20Freese\\_Testimony.pdf](https://www.uscc.gov/sites/default/files/Johnson%20Freese_Testimony.pdf).

<sup>206</sup> William Reinsch A. et al., ‘China’s Space and Counterspace Programs’, § U.S.-China Economic & Security Review Commission (2015), 56, [https://www.uscc.gov/sites/default/files/transcripts/February%2018%2C%202015\\_Transcript.pdf](https://www.uscc.gov/sites/default/files/transcripts/February%2018%2C%202015_Transcript.pdf).

<sup>207</sup> ‘Who We Are’, Space Foundation, accessed 30 June 2018, <https://www.spacefoundation.org/who-we-are>.

<sup>208</sup> Elliot Pulham, ‘Time for More Confidence in U.S.-China Space Cooperation’, *Space Watch*, September 2016, <https://www.spacefoundation.org/news/time-more-confidence-us-china-space-cooperation>.

<sup>209</sup> Sandra Erwin, ‘In the Trump Administration, Deep Mistrust of Chinese, Russian Motives in Space’, *Spacenews*, 12 April 2018, <http://spacenews.com/in-the-trump-administration-deep-mistrust-of-chinese-russian-motives-in-space/>.

<sup>210</sup> Brian Dunbar, ‘NASA Administrator Jim Bridenstine’, NASA.gov, 4 May 2018, <https://www.nasa.gov/about/highlights/bridenstine-biography.html>.

president Eisenhower in 1958, the agency's highest function has almost exclusively been fulfilled by academics, engineers and astronauts (only James Webb and Sean O'Keefe had administrative backgrounds instead). The appointment of a purely political figure with a background in the House of Representatives instead of professional expertise is a break with the non-partisan status of NASA, which even evoked opposition from fellow republicans.<sup>211</sup> As a result of this, Bridenstine was narrowly confirmed after the longest period for the agency without a permanent administrator. Vice-president Mike Pence had to break the Senate's tie, resulting in a 50-49 party-line vote, comparing unfavourably with the unanimous confirmations of the last two administrators, Charles Bolden and Michael Griffin.<sup>212</sup> This change of tradition will in all likelihood only make the Sino-US space relationship even more subject to partisan influencing at the cost of a comprehensive strategic approach.

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<sup>211</sup> Chris D'Angelo, 'Senate Confirms Climate Change Denier To Lead NASA', *Huffington Post*, 19 April 2018, [https://www.huffingtonpost.com/entry/jim-bridenstine-nasa-confirmation\\_us\\_5ad8aab7e4b03c426dac081c?guccounter=1](https://www.huffingtonpost.com/entry/jim-bridenstine-nasa-confirmation_us_5ad8aab7e4b03c426dac081c?guccounter=1).

<sup>212</sup> 'Senate Confirms New NASA Head', *Wired*, 14 April 2005, <https://www.wired.com/2005/04/senate-confirms-new-nasa-head/>; 'Bolden Confirmed As New NASA Administrator', *Space.Com*, 16 July 2009, <https://www.space.com/6988-bolden-confirmed-nasa-administrator.html>; Kenneth Chang, 'Trump's NASA Nominee, Jim Bridenstine, Confirmed by Senate on Party-Line Vote', *The New York Times*, 19 April 2018, <https://www.nytimes.com/2018/04/19/science/jim-bridenstine-nasa.html>.

## CHAPTER 3

### China's International Space Orientation and Strategic Impact

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“We'll return amid triumphant song and laughter.”

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Development of space capabilities is an expensive effort with dubious economic and intangible prestige benefits in the long term, making space cooperation an attractive option. Cooperation means shared cost, risks and data, yet also shared prestige. However, the latter is compensated by the positive peaceful and cooperative image of the state that emerges from joint projects. NASA alone has signed more than 3000 international agreements, and Europe's space accomplishments are owed entirely to its common European Space Agency bundling small national space budgets.<sup>213</sup> The clear benefits of cooperation are not lost on the Chinese. International cooperation in space is especially rewarding in terms of both domestic and international prestige, which are the primary rationales for the Chinese space program. Therefore, although its space program had to start out almost entirely independently due to Cold War political constraints and the 1960 Sino-Soviet split, China has increasingly been looking for international space partners as its program advances.

Central to global collaborative and peaceful space efforts is the International Space Station (ISS), where another instance of the US exclusionist policy can be seen. Five major space agencies, NASA, Russia's Roscosmos, ESA, Canada's CSA and Japan's JAXA, signed the Space Station Intergovernmental Agreement governing the ISS program in January 1998. Over the years, China has repeatedly expressed interest in joining the ISS. CNSA director Luan Enjie was quoted in 2001 as saying: “*Without China's participation, the ISS is not a true international program,*”<sup>214</sup> This was followed by the 2004 meeting between the new head of CNSA, Laiyan Sun and NASA administrator O'Keefe. Statements by O'Keefe around the new Bush Jr. ‘Vision for Space Exploration’ were encouraging, signalling a possibility for more cooperation with China. However, nothing would come of this and in 2007 Li Xueyong, vice-minister of science and technology, would again express Chinese interest in joining the ISS program at the 17<sup>th</sup> National CCP Congress. He commented “*China and the US need smooth cooperation in space exploration, instead of a space race.*”, and in the same statement emphasised the peaceful intentions of China's space program, indicating that joining the ISS is viewed by the Chinese as a way of clearly displaying the truth of these intentions.<sup>215</sup> When ROSCOSMOS indicated in 2010 that China had been invited to join the ISS, the Obama administration's OSTP official denied the rumours and replied dismissively: “*There're no imminent plans to include China at this point and obviously*

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<sup>213</sup> Joan Johnson-Freese and Andrew S. Erickson, ‘The Emerging China–EU Space Partnership: A Geotechnological Balancer’, *Space Policy* 22, no. 1 (February 2006): 151, <https://doi.org/10.1016/j.spacepol.2005.11.001>.

<sup>214</sup> Covault, ‘The China Card: U.S. Now Agreeable to Space Cooperation with China’.

<sup>215</sup> Jing Fu, ‘Nation Hopes to Cooperate in Space’, *China Daily*, 17 October 2007, [https://www.chinadaily.com.cn/china/2007-10/17/content\\_6181948.htm](https://www.chinadaily.com.cn/china/2007-10/17/content_6181948.htm).

*we'd have to discuss it with our international partners.*"<sup>216</sup> Later that year, an OSTP official tied Chinese participation to space program transparency and non-proliferation issues.<sup>217</sup> When the option was again floated by ROSCOSMOS in 2012, Representative Wolf immediately send a letter to NASA Administrator Bolden, stating that "*NASA should make clear that the U.S. will not accept Chinese participation in any station-related activities.*"<sup>218</sup> Still, Bolden remarked in 2015 that he considered the ban on human spaceflight cooperation with China as something temporary, in response to which the CNSA Administrator expressed hope that the temporary timeframe could be shortened.<sup>219</sup> While China continuously expressed interest in joining the completely science-oriented ISS program, the US has continuously refused to invite CNSA. Because the ISS program is multilateral and therefore not subject to the Wolf Amendment, this stance is another face of the US exclusionist policy towards the Chinese space program.

## 1. WITH CHINESE CHARACTERISTICS

Facing exclusion by the world's leading space power, China has turned to extensive bilateral cooperation on space, also involving non-traditional space states. Cooperation with Russia reached a post-USSR peak in 1995, when the two countries signed a treaty in which China received Russian engine, docking and space suit technology in addition to taikonaut training and an empty Soyuz capsule. This willing transfer of technology by Russia caused the Shenzhou capsule to be highly similar to the Soyuz, indicating the technological value of this transaction for China.<sup>220</sup> However, starting in 2004, the cooperation dynamic of China's space program began to change. In a \$311 million deal, China would manufacture and launch a satellite for Nigeria.<sup>221</sup> It was an important milestone for the China Great Wall Industry Corporation, although it failed after just six months. In 2017, Nigeria and China signed a new deal for \$550 million, in which China would not only manufacture and launch the satellite, but also provide the financing.<sup>222</sup> This type of deal has become more common, with Chinese's satellites and their launch being sold to

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<sup>216</sup> Tariq Malik, 'Obama Seeks Global Cooperation in Space', *NBC News*, 28 June 2010, [http://www.nbcnews.com/id/37979813/ns/technology\\_and\\_science-space/t/obama-seeks-global-cooperation-space/#.WzjqzdIzbDf](http://www.nbcnews.com/id/37979813/ns/technology_and_science-space/t/obama-seeks-global-cooperation-space/#.WzjqzdIzbDf); Tariq Malik, 'China Has Not Been Invited to Join International Space Station, NASA Says', *Space.Com*, 28 June 2010, <https://www.space.com/8675-china-invited-join-international-space-station-nasa.html>.

<sup>217</sup> Amy Klamper, 'Human Spaceflight On the Agenda for NASA Chief's China Trip', *Space.Com*, 12 October 2010, <https://www.space.com/9317-human-spaceflight-agenda-nasa-chief-china-trip.html>.

<sup>218</sup> Frank Wolf R., 5 March 2012, [http://americaspace.com/wp-content/uploads/space\\_docs/Wolf\\_Bolden\\_Letter\\_3\\_5\\_2012.pdf](http://americaspace.com/wp-content/uploads/space_docs/Wolf_Bolden_Letter_3_5_2012.pdf).

<sup>219</sup> Irene Klotz, 'NASA Chief Says Ban on Chinese Partnerships Is Temporary', *Reuters*, 12 October 2015, <https://www.reuters.com/article/us-space-usa-china/nasa-chief-says-ban-on-chinese-partnerships-is-temporary-idUSKCN0S61SU20151012>.

<sup>220</sup> Handberg and Li, *Chinese Space Policy: A Study in Domestic and International Politics*, 139.

<sup>221</sup> Edward Cody, 'China Builds And Launches A Satellite For Nigeria', *Washington Post*, 14 May 2007, sec. Foreign Service, <http://www.washingtonpost.com/wp-dyn/content/article/2007/05/13/AR2007051301264.html>.

<sup>222</sup> Felix Onuah and Chijioke Ohuocha, 'Nigeria Agrees \$550 Million Satellite Deal with China', *Reuters*, 3 January 2018, <https://www.reuters.com/article/us-nigeria-satellite-china/nigeria-agrees-550-million-satellite-deal-with-china-idUSKBN1ES1G0>.

Cambodia, Laos, Pakistan, Algeria, Belarus and Bolivia.<sup>223</sup> Chinese cooperation with traditional space powers has also increased over the years, as agreements were signed with Russia and the EU. Russia has even been invited in 2017 to participate in the construction of the new Chinese space station Tiangong-2, potentially making it a first-tier partner in the only operational space station after 2024.<sup>224</sup> Meanwhile, the German news magazine 'Der Spiegel' in 2013 already speculated on a change in space leadership from the US to China following increased cooperation between the EU and China. In the piece, even former NASA Administrator Michael Griffin is quoted saying: "China is on track to become the world's leading space-faring nation".<sup>225</sup> Or as CNSA Administrator Xu Dazhe put it in 2015: "China has no difficulties in our cooperation policies with other agencies."<sup>226</sup>

Due to increasing Chinese cooperation agreements around the world with traditional and non-traditional spacefaring states, rumours have started of a Sino-US space race. With far more states able to contribute significantly to spacefaring efforts, the current supposed space race centres far more around attracting cooperation partners than the old US-Soviet space race. Cooperation in space has frequently been described by the Chinese as a win-win scenario, a qualification that is also central in the Chinese advocacy for the OBOR initiative.<sup>227</sup> In order to both address US demands for increased transparency of its space program, and to showcase its supposedly purely peaceful intentions in space, the Chinese government has released 'white papers on China's space activities' since 2000. These white papers never mention any military use of space, through reconnaissance and communications satellites, ASAT technology or otherwise.<sup>228</sup> However, references to security of launch capability and space utilisation have increased from the 2011 to the 2016 white paper.<sup>229</sup> Some dual-use technology is also mentioned in the 2016 white paper. Laser communications for example, can be used for benign high-speed communication between satellites and ground stations, yet can also be used to 'fry' satellites if overcharged. Additionally, the research into quantum encryption techniques could potentially ensure the PLA of 'unhackable' communications. At the same time that references to security in the white papers increased, other changes signal a greater emphasis of the Chinese government on

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<sup>223</sup> Caleb Henry, 'Cambodia to Buy Chinese Satellite as Relations Tighten on Belt and Road Initiative', *Spacenews*, 12 January 2018, <http://spacenews.com/cambodia-to-buy-chinese-satellite-as-relations-tighten-on-belt-and-road-initiative/>; 'Bolivia's Chinese-Made Satellite Brings in 19 Mln USD', *China Space News*, 28 December 2015, <http://english.spacechina.com/n16421/n17219/c1139801/content.html>.

<sup>224</sup> 'With a Strong Partner Like Russia, Nothing Would Stop China's New Space Station', *Sputnik*, 23 June 2017, [http://www.spacedaily.com/reports/With\\_a\\_Strong\\_Partner\\_Like\\_Russia\\_Nothing\\_Would\\_Stop\\_Chinas\\_New\\_Space\\_Station\\_999.html](http://www.spacedaily.com/reports/With_a_Strong_Partner_Like_Russia_Nothing_Would_Stop_Chinas_New_Space_Station_999.html).

<sup>225</sup> Kevin Holden Platt, 'Shifting Constellations, Europe Eyes China in Space Race', *Spiegel Online*, 8 February 2013, <http://www.spiegel.de/international/europe/esa-mulls-new-alliance-as-china-becomes-space-leader-a-882212.html>.

<sup>226</sup> Klotz, 'NASA Chief Says Ban on Chinese Partnerships Is Temporary'.

<sup>227</sup> Xuxin, 'Xinhua Insight: Moon or Mars? Heated Discussion on Human's next Stop', *Xinhua*, 9 June 2017, [http://www.xinhuanet.com/english/2017-06/09/c\\_136353684.htm](http://www.xinhuanet.com/english/2017-06/09/c_136353684.htm); Jingxi Mo, 'Purpose of Belt and Road Is a Win-Win for All', *China Daily*, 17 October 2017, [http://www.chinadaily.com.cn/china/19thcpcnationalcongress/2017-10/17/content\\_33378296.htm](http://www.chinadaily.com.cn/china/19thcpcnationalcongress/2017-10/17/content_33378296.htm).

<sup>228</sup> 'China's Space Activities in 2011' (Information Office of the State Council, December 2011), [http://www.gov.cn/english/official/2011-12/29/content\\_2033200.htm](http://www.gov.cn/english/official/2011-12/29/content_2033200.htm); 'China's Space Activities in 2016'.

<sup>229</sup> Sheehan, "Did You See That, Grandpa Mao?"

cooperation, increased transparency and the ‘hiding of capabilities’. In the stated ‘principles of development’ guiding Chinese space policy, the words “scientific’ and ‘independent’ were replaced by ‘open’ and ‘coordinated’.<sup>230</sup> Additionally, only a few lines in the 2016 white paper were spent on the progress made in manned space program. This was likely done in order not to seem too eager to dethrone the US as the most prominent manned spaceflight country. On the other hand, the manned space program is a symbol for the peaceful use of outer space, and as such it has also been promoted by Chinese state media even within the Washington Post.<sup>231</sup> In order to dispel the rumours of a Sino-US space race, China has to tread a thin line between increased transparency and the challenging of US prestige.

While the old space race was a race for international prestige through the display of economic, scientific and technical prowess, a space race towards weaponization is currently looming as well. As the US has comprehensively integrated space based C4IRS into all its military operations, its space assets have become an enticing target. PLA writers have been known for some time to designate the US military space assets as its Achilles heel; powerful force multipliers, yet critically vulnerable. Striking these assets could fatally disrupt the US army and the satellites themselves are not easily defended by the US, making them perfect targets in asymmetric warfare. With the 2007 and following ASAT tests, China has demonstrated the ability to strike US military satellites. However, China together with Russia, have also spearheaded a UN approach to counteract the evolution of outer space into just another warfighting domain. Their proposed ‘Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Objects’ (PPWT) in the UN Conference on Disarmament is an effort to prevent such an arms race in space.<sup>232</sup> Prompted by increasingly aggressive US Air Force doctrine, with statements such as “*Space superiority provides freedom to attack.*”, China has sought to use international law to level the playing field.<sup>233</sup> In response, the Under Secretary of State John Bolton said in 2004: “*We are not prepared to negotiate on the so-called arms race in outer space. We just don't see that as a worthwhile enterprise.*”<sup>234</sup> In 2005 the US doubled down by arguing that because there was no arms race in outer space, there also was no arms control problem to address.<sup>235</sup> This statement either displays a fundamental misunderstanding of the meaning of the word ‘prevention’ in the PPWT, or is a reaction necessary to fulfil the Bush National Space Policy’s goal to retain complete freedom of action in space. In 2014, the US objection had shifted primarily towards the claim that the PPWT would not ban terrestrial ASAT weapons like the one

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<sup>230</sup> ‘China’s Space Activities in 2011’; ‘China’s Space Activities in 2016’.

<sup>231</sup> Keith Cowing, ‘China Reminds Washington About Their Space Program’, *NASA Watch* (blog), 28 February 2018, <http://nasawatch.com/archives/2018/02/china-reminds-w.html>.

<sup>232</sup> ‘Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects(Draft)’ (Ministry of Foreign Affairs, the People’s Republic of China, 16 June 2014),

[http://www.fmprc.gov.cn/mfa\\_eng/wjb\\_663304/zzjg\\_663340/jks\\_665232/kjfywj\\_665252/t1165762.shtml](http://www.fmprc.gov.cn/mfa_eng/wjb_663304/zzjg_663340/jks_665232/kjfywj_665252/t1165762.shtml).

<sup>233</sup> John Tierney F. et al., ‘Weaponizing Space: Is Current U.S. Policy Protecting Our National Security?’, Pub. L. No. 110–18, § Subcommittee on National Security and Foreign Affairs (2007).

<sup>234</sup> Tierney et al.

<sup>235</sup> ‘Prevention of Outer Space Arms Race, Mediterranean Security Among Issues, as Disarmament Committee Approves Seven More Texts’.

demonstrated by China in 2007.<sup>236</sup> However, the proposed text states: “*States Parties to this Treaty shall: [...] – not resort to the threat or use of force against outer space objects of States Parties;*”, which would clearly cover *any* ASAT weapon.<sup>237</sup> Instead, the US advocates the looser EU ‘International Code of Conduct for Outer Space Activities’.<sup>238</sup> By opposing the PPWT with dubious justification, the US is not just trying to preserve its superiority in military space, but also in setting international rules of conduct. As the U.S. Permanent Representative to the Conference on Disarmament said on October 20, 2017 in an explanation for voting against a PPWT related resolution:

*“It is also worth noting that this resolution offers an example of China’s attempts to impose its national view of multilateralism and world geopolitics on the international system. Our countries cannot agree to this language, but look forward to working with China and others in the months and years ahead to sustain and strengthen the international norms on which the global system is based.”*<sup>239</sup>

The issue of utilising space for military enhancement is not just driven by the retention of a military advantage, but also by the US fear that it might lose its power to shape the international system to China.

## 2. STRATEGIC IMPACT

Already in 1992, China has started efforts to expand space cooperation beyond bilateral deals into multilateral institutionalised cooperation with the Asia-Pacific Workshop on Multilateral Cooperation in Space Technology and Applications (AP-MCSTA). In 2005, its member states agreed to form the Asia-Pacific Space Cooperation Organization (APSCO) as the next step to institutionalise Asian space cooperation.<sup>240</sup> Its current members are Bangladesh, China, Iran, Mongolia, Pakistan, Peru, Thailand and Turkey. Notable is the absence of the space powers Russia, Japan and India (as well as South-Korea to a lesser degree).<sup>241</sup> Japan founded its own regional space entity in 1993: the Asia-Pacific Regional Space Agency Forum (APRSAF). Amongst its 727 member-organisations are also the German and Canadian space agencies, making it far less

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<sup>236</sup> Jeff Foust, ‘U.S. Dismisses Space Weapons Treaty Proposal As “Fundamentally Flawed”’, *Spacenews*, 11 September 2014, <http://spacenews.com/41842us-dismisses-space-weapons-treaty-proposal-as-fundamentally-flawed/>.

<sup>237</sup> ‘Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects(Draft)’.

<sup>238</sup> Micah Zenko, ‘A Code of Conduct for Outer Space’ (Council on Foreign Relations, 30 November 2011), <https://www.cfr.org/report/code-conduct-outer-space>.

<sup>239</sup> Robert Wood, ‘Explanation of Vote in the First Committee on Resolution L.54: Further Practical Measures for the Prevention of an Arms Race in Outer Space’ (United States Mission to the United Nations, 20 October 2016), <https://usun.state.gov/remarks/8085>.

<sup>240</sup> ‘Initialization Stage of APSCO’, Asia-Pacific Space Cooperation Organization, accessed 30 June 2018, [http://www.apsco.int/AboutApscosS.asp?LinkNameW1=History\\_of\\_APSCO&LinkNameW2=Initialization\\_Stage\\_of\\_APSCO&LinkCodeN3=11171&LinkCodeN=17](http://www.apsco.int/AboutApscosS.asp?LinkNameW1=History_of_APSCO&LinkNameW2=Initialization_Stage_of_APSCO&LinkCodeN3=11171&LinkCodeN=17).

<sup>241</sup> ‘APSCO Member States’, Asia-Pacific Space Cooperation Organization, accessed 30 June 2018, [http://www.apsco.int/AboutApsco.asp?LinkNameW1=APSCO\\_Member\\_States&LinkCodeN=11](http://www.apsco.int/AboutApsco.asp?LinkNameW1=APSCO_Member_States&LinkCodeN=11).

of a purely regional organisation than APSCO.<sup>242</sup> Even though, or perhaps partially due to the involvement of so many organisations (including large space agencies), the informal setting of APRSAF has produced little more than data sharing initiatives.<sup>243</sup> In contrast, APSCO, while lacking members other than China with a significant space program, has been working towards a unified space observation network, navigation cooperation and a joint satellite program.<sup>244</sup> That it should be seen more as a (supra)regional diplomacy tool for China, can be seen in the joint organisation by APSCO and CNSA of the ‘APSCO Development Strategy Forum’ with the theme of *“The Belt and Road Initiative for facilitating space capabilities building of the Asia Pacific countries”*.<sup>245</sup> The use of the ‘Belt and Road Initiative’ or ‘One Belt One Road’ (OBOR) project as a central point of Chinese space diplomacy can also be seen in the government white paper on space activities in 2016. Under ‘Key areas for future cooperation’, the first point mentioned is the *“Construction of the Belt and Road Initiative Space Information Corridor,”*<sup>246</sup> This focus on OBOR, combined with the lack of space technology contributions possible from other APSCO members, and the previously mentioned satellite agreements with countries such as Nigeria, Belarus and Bolivia, all show that China is less focused on using space cooperation to complement its own space efforts, and more on using it as a diplomatic favour to developing nations.

At the same time, the 2016 white paper notes *“attaching importance to space cooperation under the BRICS cooperation mechanism and within the framework of the Shanghai Cooperation Organization”* as a fundamental policy, showing that the Chinese government is pursuing multiple platforms for use in space cooperation with peers.<sup>247</sup> It is therefore important to note the difference in members and scope of these organisations. The Shanghai Cooperation Organisation (SCO) has included Russia since its founding in 1996, and India has also become a member in June of 2017.<sup>248</sup> BRICS also includes Brazil, with which China has extensive bilateral space cooperation, in addition to Russia and India. While the potential scale of space cooperation is greater for the SCO and BRICS, China has less influence on their direction in contrast to APSCO.

In 2013, China has started with the formation of its own institutions as alternatives for US-dominated global institutions, and space could be next. China announced both OBOR and Asian Infrastructure Investment Bank (AIIB), two enormous and complementary strategic initiatives towards the end of 2013.<sup>249</sup> Both OBOR and the AIIB form challenges the US influence in the region. However, the AIIB goes further than that, by creating an alternative to the US-dominated

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<sup>242</sup> ‘Countries and Regions’, Asia-Pacific Regional Space Agency Forum, accessed 30 June 2018, <https://www.aprsaf.org/participants/>.

<sup>243</sup> ‘About Initiatives’, Asia-Pacific Regional Space Agency Forum, accessed 30 June 2018, <https://www.aprsaf.org/participants/>.

<sup>244</sup> ‘ACSAT’, Asia-Pacific Space Cooperation Organization, accessed 30 June 2018, <http://www.apsco.int/program.asp?LinkNameW1=ACSAT&LinkCodeN=87>.

<sup>245</sup> ‘2015 Beijing Declaration of the Asia-Pacific Space Cooperation Organization Development Strategy Forum’ (APSCO, 27 October 2015), [http://www.apsco.int/AboutApsco.asp?LinkNameW1=APSCO\\_Development\\_Strategy\\_Forum&LinkCodeN=26676](http://www.apsco.int/AboutApsco.asp?LinkNameW1=APSCO_Development_Strategy_Forum&LinkCodeN=26676).

<sup>246</sup> ‘China’s Space Activities in 2016’.

<sup>247</sup> ‘China’s Space Activities in 2016’.

<sup>248</sup> ‘About SCO’, The Shanghai Cooperation Organisation, 9 January 2017, [http://eng.sectesco.org/about\\_sco/](http://eng.sectesco.org/about_sco/).

<sup>249</sup> Lai-Ha Chan, ‘The AIIB and China’s Soft Balancing Against the US Pivot to Asia’ (Australian Institute of International Affairs, 19 September 2017), <http://www.internationalaffairs.org.au/australianoutlook/aiia-balancing-us-pivot-asia-rationale/>.

Bretton Woods institutions.<sup>250</sup> This strategy of creating parallel structures whilst staying involved in the current institutions has been called “*China’s shadow foreign-policy*”.<sup>251</sup> At the June 2017 Global Space Exploration Conference (GLEX) held in Beijing, the Chinese delegation introduced the idea of a “*global space agency*”.<sup>252</sup> While clearly an idea in its infancy (although not new), and possibly just a gesture to emphasise Chinese willingness to cooperate in space, it indicates a confidence from the Chinese side.<sup>253</sup> In the meantime, China has already invited all UN member states to utilize its future space station.<sup>254</sup>

While China easily finds new international partners to cooperate in space, the US is increasingly estranging former partners in the context of an ending ISS program. The US fear of proliferating dual-use items caused a complicated set of export restrictions to emerge. This made cooperation with international partners such as Russia, Japan and the EU increasingly difficult. After the end of the Cold War in 1991, the US was the only viable and high-level partner available for space cooperation. Even Russia was tied to the ISS program and refrained from developing their own ambitious space projects. With the success of China’s first manned spaceflight in 2003 and the promise of a 2022 Chinese Space Station, this situation has changed dramatically.<sup>255</sup> This dynamic is felt not only in China, but around the world. Already in 2013, half of Americans reportedly thought that the US is losing its leadership in space.<sup>256</sup> The EU and other international partners have been frustrated by the repeated changes in the directions of the US space program. From a return to the Moon under Bush Jr., to a mission to Mars under Obama and back to the Moon under Trump, the major direction has changed and then completely reverted back in only eight years’ time.<sup>257</sup> Due to the intrinsic need of space projects for long term commitment, this unpredictable behaviour by the US discourages traditional international partners like the EU.<sup>258</sup>

Since the Tiananmen Square sanctions, China has been excluded by the US from cooperation in space in multiple ways. China was not allowed to participate in the ISS, economic space engagement was targeted with major sanctions in 1990 and 1999, and 2011 saw an official and

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<sup>250</sup> Chan.

<sup>251</sup> Sebastian Heilmann et al., ‘China’s Shadow Foreign Policy: Parallel Structures Challenge the Established International Order’, 2014.

<sup>252</sup> Emma Huis, ‘Will Space Exploration Lead Us to a Global Space Agency?’ (IAF Secretariat), accessed 30 June 2018, <http://www.iafastro.org/wp-content/uploads/2014/04/GLEX-2017-Will-Space-Exploration-lead-us-to-a-Global-Space-Agency.pdf>.

<sup>253</sup> A. S. Paridov, ‘Creating a World Space Organization, a Global Approach to Mastering Space’, *Space Policy*, May 1988, 113–14.

<sup>254</sup> Huaxia, ‘1st LD: China Welcomes All UN Member States to Jointly Utilize Its Space Station’, *Xinhua*, 29 May 2018, [http://www.xinhuanet.com/english/2018-05/29/c\\_137213186.htm](http://www.xinhuanet.com/english/2018-05/29/c_137213186.htm).

<sup>255</sup> Namrata Goswami, ‘What China’s Upcoming Space Station Means for the World’, *The Diplomat*, 2 June 2018, <https://thediplomat.com/2018/06/what-chinas-upcoming-space-station-means-for-the-world/>.

<sup>256</sup> Katie Jagel, ‘Poll Results: Space Exploration’, YouGov, 7 November 2013, <https://today.yougov.com/topics/science/articles-reports/2013/11/07/poll-results-space-exploration>.

<sup>257</sup> Yen Rae Wang, ‘NASA Statement on National Space Council Policy for Future American Leadership in Space’, ed. Katherine Brown (NASA Headquarters, 5 October 2017), <https://www.nasa.gov/press-release/nasa-statement-on-national-space-council-policy-for-future-american-leadership-in>.

<sup>258</sup> James D. Rendleman and J. Walter Faulconer, ‘Improving International Space Cooperation: Considerations for the USA’, *Space Policy* 26, no. 3 (August 2010): 143–51, <https://doi.org/10.1016/j.spacepol.2010.06.008>.

complete ban on any bilateral cooperation by NASA. Together, these comprise the US exclusionist policy towards the Chinese space program. With the possible exception of the ISS-exclusion, the components have been motivated by human rights concerns and China threat theory. While the line of exclusion was at times broken by presidential effort –the waiving of sanctions and engagement in strategic dialogue–, it represents a near continuous attempt to isolate the Chinese space program from international cooperation. This has elicited claims of a US ‘Cold War mindset’ from China as well as from prominent US academics.<sup>259</sup> As Joan Johnson-Freese stated in 2006: “*At present, space is one of the last remaining venues of Cold War politics.*”<sup>260</sup> Wu Zurong, who appears to have functioned as ambassador of China to Vanuatu and Consul General to Houston, even narrowed it down to “*a few US politicians with Cold War mentality*” and specifically mentions Congressman Wolf.<sup>261</sup>

Meanwhile, as China’s bilateral and multilateral partnerships in space continue to increase, the US is becoming the odd one out.<sup>262</sup> Due to the severe isolation the Chinese space program experienced from its inception, the Chinese are self-reliant to a high degree, decreasing the effectiveness of US exclusion.<sup>263</sup> Still, the turn towards engagement and possible cooperation advocated by the majority of academics is not likely to occur any time soon.<sup>264</sup> The Trump administration has announced a new National Space Strategy that emphasises domestic gains and warfare in space stating:

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<sup>259</sup> Zhao Yanrong, ‘China Hits at NASA’s Conference Ban’, *China Daily USA*, 10 October 2013, [http://usa.chinadaily.com.cn/china/2013-10/10/content\\_17018959.htm](http://usa.chinadaily.com.cn/china/2013-10/10/content_17018959.htm); Lu Hui, ‘China Urges U.S. to View Bilateral Ties in Correct Way’, *Xinhua*, 31 January 2018, [http://www.xinhuanet.com/english/2018-01/31/c\\_136939426.htm](http://www.xinhuanet.com/english/2018-01/31/c_136939426.htm).

<sup>260</sup> Joan Johnson-Freese, ‘A New US-Sino Space Relationship: Moving Toward Cooperation’, *Astropolitics* 4, no. 2 (1 August 2006): 143, <https://doi.org/10.1080/14777620600910571>.

<sup>261</sup> Wu Zurong, ‘A Typical Case of US Politicians Going Back to Cold War Years’, *China-US Focus*, 7 October 2013, <https://www.chinausfocus.com/peace-security/a-typical-case-of-us-politicians-going-back-to-cold-war-years>; ‘China Appoints New Ambassadors’, *People’s Daily*, 31 March 2001, [http://en.people.cn/english/200103/31/eng20010331\\_66453.html](http://en.people.cn/english/200103/31/eng20010331_66453.html); ‘Chinese Consul Generals to Houston(America)’, Ministry of Foreign Affairs of the People’s Republic of China, accessed 30 June 2018, [http://www.fmprc.gov.cn/mfa\\_eng/ziliao\\_665539/wjrw\\_665549/lrls\\_665575/bmdyz\\_665587/t164390.shtml](http://www.fmprc.gov.cn/mfa_eng/ziliao_665539/wjrw_665549/lrls_665575/bmdyz_665587/t164390.shtml).

<sup>262</sup> ZX, ‘China Strengthens International Space Cooperation’, *Xinhua*, 19 April 2018, [http://www.xinhuanet.com/english/2018-04/19/c\\_137123117.htm](http://www.xinhuanet.com/english/2018-04/19/c_137123117.htm).

<sup>263</sup> David, ‘U.S.-China Cooperation: The Great Space Debate’.

<sup>264</sup> Rendleman and Faulconer, ‘Improving International Space Cooperation’; James Clay Moltz, ‘China, the United States, and Prospects for Asian Space Cooperation’, *Journal of Contemporary China* 20, no. 68 (January 2011): 69–87, <https://doi.org/10.1080/10670564.2011.520847>; Hester, ‘China and NASA: The Challenges to Collaboration with a Rising Space Power’; Jeffrey Logan, ‘China’s Space Program: Options for US-China Cooperation’ (LIBRARY OF CONGRESS WASHINGTON DC CONGRESSIONAL RESEARCH SERVICE, 2007); William Martel C. and Toshi Yoshihara, ‘Averting a Sino-U.S. Space Race’, *Washington Quarterly* 26, no. 4 (2003): 19–35, <https://doi.org/10.1162/016366003322387082>; Johnson-Freese, ‘A New US-Sino Space Relationship’.

*“our competitors and adversaries have turned space into a warfighting domain. [...] the United States will seek to deter, counter, and defeat threats in the space domain that are hostile to the national interests of the United States and our allies”*<sup>265</sup>

In addition to this aggressive stance on space as a warfighting domain, Scott Pace, the executive director of the US National Space Council has said that *“outer space is not a ‘global commons,’ not the ‘common heritage of mankind,’ not ‘res communis,’ nor is it a public good.”*<sup>266</sup> The Strategic & Economic Dialogue established under the Obama has also been reduced to a ‘Comprehensive Economic Dialogue’, removing a platform for strategic communication on space affairs.<sup>267</sup> This indicates a determined continuation by the Trump administration of the exclusion of China from space cooperation with the US, the heightening of tensions surrounding space weaponization and a general reduction in Sino-US engagement. Traditional partners of the US in space are worried by the current direction. A report from the European Space Policy Institute has already identified the new context as a *“the perhaps historic opportunity for Europe to achieve a higher degree of autonomy (in space affairs, and beyond)”*<sup>268</sup> With the EU looking for less reliance on a US that is straining the trans-Atlantic relationship and smaller as well as non-spacefaring countries eager for win-win cooperation with China, leadership in space is in transition.

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<sup>265</sup> ‘President Donald J. Trump Is Unveiling an America First National Space Strategy’ (The White House, 23 March 2018), <https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-unveiling-america-first-national-space-strategy/>.

<sup>266</sup> Scott Pace, ‘Space Development, Law, and Values’ (IISL Galloway Space Law Symposium, Washington, D.C., 13 December 2017), [https://spacepolicyonline.com/wp-content/uploads/2017/12/Scott-Pace-to-Galloway-FINAL.pdf?utm\\_content=buffer66778&utm\\_medium=social&utm\\_source=twitter.com&utm\\_campaign=buffer](https://spacepolicyonline.com/wp-content/uploads/2017/12/Scott-Pace-to-Galloway-FINAL.pdf?utm_content=buffer66778&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer).

<sup>267</sup> ‘U.S.-China Comprehensive Economic Dialogue’, U.S. Department of the Treasury, accessed 30 June 2018, <https://www.treasury.gov/initiatives/Pages/china.aspx>.

<sup>268</sup> ‘Trump’s Administration Plans for Space: Implications for Europe’ (European Space Policy Institute, 8 January 2017), <https://espi.or.at/publications/espi-executive-briefs/category/5-espi-executive-briefs>.

## CONCLUSION

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Like all early space programs, the Chinese space program started from military motivations. Necessitated by the geopolitical isolation, especially after the 1960 Sino-Soviet split, the program was nearly fully self-reliant. Considerations of prestige combined with the military rationale in propelling the continuation of the program, even during times of economic hardship and the internal conflict the Cultural Revolutions. Together, the rationales were powerful enough to prioritize the space program over economic stimulation and poverty relief. Only under Deng Xiaoping in the 1980s, the focus shifted to the economic benefits of the space program. These came both directly as launch services to international customers and through the science and technology benefits associated with the technical investment and advancement. With the start of the human spaceflight 'project 921' in 1992, prestige returned as a powerful driver for continued political and capital commitment to space. Both domestically as a sign of CCP competence, and internationally as sign of the return of China as a great power, the space program provided unique prestige benefits. After rapprochement in 1972 and even after the normalisation of relations in 1979, the Sino-US relationship regarding space was contentious. While the promise of science and technology cooperation helped the normalisation of relations, the incidents of Tiananmen square in 1989 and the Hughes and Loral incidents of 1999 prevented actual cooperation in space. Due to these events, China was still seen as a treat to US values and one that sought to extract one-sided benefits from any space program contact with the US through dual-use technology. Sanctions from Congress in 1990 and 1999 even prevented most commercial contact with the Chinese space program.

While president Reagan had approved export licences and Bush Sr. issued waivers for the sanctions, an executive effort to broadly engage China on space only came under Obama. Especially the Strategic track of the S&E Dialogue provided a platform for the US and China, with both the OSTP and NASA representatives taking part. When the US-China joint statements issued in 2009 and 2011 became more concrete in progressing towards space cooperation, House representative Frank Wolf introduced an amendment to the funding of NASA to prohibit such cooperation. Together with a handful of representatives on important committee positions in the House, he succeeded in stifling space cooperation even before it started. These House representatives argue cooperation on space cannot be justified in the light of China's undemocratic system and violations of human rights. Seeing China only in the light of China threat theory, they come to a blanket rejection of cooperation and engagement based on unrelated issues. By merely restricting diplomatic manoeuvrability and even trying to prevent a dialogue with NASA or the OSTP present, these actions do not constitute a strategic approach. Together, the commercial sanctions of the 1990s, the continued refusal of the US to let China join the ISS and the Wolf Amendment, form the US exclusionist policy vis-à-vis the Chinese space program. Despite US sanctions, regulation and its 2007 ASAT test, China has little difficulty finding new partners for space projects. The EU, less bothered by potential technology transfer or dual-use gains for the Chinese, has already been involved in the Chang'e moon exploration program. This openness to cooperation with China in space comes in part from frustration with US regulation and regular programmatic upheaval. Bilaterally, China has several space projects with developing

nations and nations without a significant space program of their own. In addition, China is trying out the multilateral route to regional space cooperation through APSCO and SCO and OBOR. Other countries seem eager to benefit from China's technological assistance in acquiring communication and navigation services they otherwise would not be able to obtain. With the redirection of NASA's main objective in 2017, the end of the ISS in 2025 and the prospect of a Chinese space station in 2022, it seems that building strategic partnerships for space is only becoming easier for China. The US exclusionist policy towards the Chinese space program is therefore neither monolithic, strategic nor effective.

