

Studies in Space Policy

Marco Aliberti

When China Goes to the Moon...

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Foreword

The world is in flux. Twenty-five years of relative hegemonic stability seem to be coming to an end. And with this comes challenges to the dominating ideology of liberal democracy and to its proponents. ISIS offers a return to the Middle Ages as an approach, Singapore trumpets a unique authoritarian and benevolent model, and Latin America is revisiting various left-wing governance concepts.

China, never much impressed with liberal democracy, has completed the transition to the fifth leadership generation. The new leadership has to deal with the consequences of the relentless growth model introduced by Deng Xiaoping while balancing carefully party rule and the cry for more freedoms. As opposed to Mao era's fervent proselyting, it is doubtful that China will embark on a new journey of ideological warfare now. In fact, this has never been China's path, apart from Mao's time. Chinese exceptionalism is culturally non-expansionist—Chinese exceptionalism lies in the alleged possession of the heavenly mandate, and that cannot be shared. American exceptionalism is founded on its Constitution and the values embodied therein, and there is an inherent ideological expansionism involved. Books like Francis Fukuyama's *The End of History* illustrate the mind-set. This asymmetry in exceptionalism is not well recognised, particularly in the United States, but might provide hope for a future without superpower confrontation. A rising power without interest in evangelising might be able to establish a constructive relationship with the established hegemon so deeply attached to its "universal" values. However, this requires that the hegemon understands the opportunity for non-confrontation, and in this respect there is some way to go in the United States.

This brings us to the specific topic of Marco Aliberti's book, namely, the possible role of space as a bridge builder between actors that see a divide but find few tools to bridge it. Space has frequently been a harbinger of things to come. Space has often been used as a geopolitical tool, not only in times of confrontation but also as a symbol and instrument of cooperation. Marco Aliberti's book explores the possibilities of using China's likely quest to go to the Moon as a tool to create trust and cooperation with a reluctant American partner and Europe's possibilities

to be a facilitator and participant. But the book also seeks to assess the situation if cooperation in the reconquest of the Moon cannot be achieved. The book draws attention to the cultural fallout for the existing major space powers if China goes to the Moon on its own and highlights how a possible new space race is likely to lead to embarrassment for the United States and its space allies.

When China Goes to the Moon seeks to reach far beyond the traditional space community—to the geostrategists, overall policymakers, and interested general public. In doing so, it makes a rather introvert field generally accessible by providing comprehensive and easy-to-digest overviews of China's space programmes and space organisations. In a similar fashion, it zooms in on the current state of play of China's efforts in human spaceflight and the rationale for China possibly going to the Moon and the technical challenges in this respect. However, the special merit of Marco Aliberti's work is that it puts China's space endeavours into the broader political and societal setting, something few other books, if any, have done.

When analysing history it is easy to see how it contains a number of watershed points. Identifying such points without the benefit of hindsight is not so straightforward, yet it is relatively safe to say that the global community is currently in front of one. Many forces need to be aligned to make a positive outcome possible. It is my hope that *When China Goes to the Moon* will demonstrate to a wide audience that space can be a potent tool for such an alignment. The global community is not involved in a zero-sum game. Humankind has a unique possibility to continue the path of prosperity and relative peace on Earth. Is it not a beautiful thought that by going back to the Moon together a contribution could be made to a splendid common future on Earth?

Peter Hulsroj
Director, European Space Policy Institute
Vienna, Austria

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It remains, of course, that the responsibility for errors, inaccuracies, and infelicities rests with me, despite all the help and inspiration given by so many.

In conclusion, I want to thank and dedicate this book to my family and in particular to my son Ascanio, my most treasured source of strength and inspiration.

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Chapter 1

Introduction

La nation la plus sage et la plus policée de tout l'univers.
Voltaire
Le gouvernement chinois, comme celui de tous les peuples
esclaves, est trop vicieux pour se rendre respectable par ses
propres forces. . .
Montesquieu

When European travellers and missionaries retraced the steps of Marco Polo back to China at the beginning of the sixteenth century, they had heard the stories about its wealth and exquisite culture. Yet, they marvelled. In scale and sophistication, China was in a league of its own. There were similarities to Europe, and yet the many differences were striking.

It was a world unto itself, the cradle of an ancient civilisation which, incomprehensibly to the Europeans, blossomed *outside* and *before* the Biblical order. Its culture, language and sociopolitical institutions were all symbols of a refined and millennia-long tradition, which did not simply assert the status of a great civilisation but claimed to be civilisation itself. To emphasise this superiority over the non-Chinese world, China called itself the “Central Kingdom”¹; a potentially universal empire from which values radiated and whose borders were only set by cultural isobars. This elevated perception of its status was matched and supported by a level of scientific and technological sophistication that often outshone that of Europe. At least initially, Europeans were also surprised by the presence of a prosperous and ordered society that was ably administered by a highly educated class of literati selected on a meritocratic basis. As for the presiding Ming dynasty, it resonated with grandiosity.

To Europeans, affluence and virtue no longer appeared to be the natural monopoly of Europe. The *Great Encounter* with the Chinese civilisation understandably

¹This book utilises the term “Central Kingdom”, rather than “Middle Kingdom”, to designate China. Although the term “Middle Kingdom” finds a broader application within the scholarly production and the Chinese ideograms 中国 “zhong-guo” denominating China comprise both meanings, the word “central” better grasps the concept of Sino-centrism in China’s *Weltanschauung*. Indeed, while the word “middle” appears to have only a geographical and political connotation, the term “central” also expresses the “civilisational” aspect of China’s centrality (thus their cultural superiority) within the *Tianxia* (what is under the heaven, the world).

had a profound impact on the Occident. It simultaneously fascinated and frightened Europeans, generating powerful and contradictory feelings that in some sense have resurfaced dramatically today. Indeed, China's astonishing rise—or more properly, resurgence—as a great power on the international stage, combined with an awareness of its sociocultural “singularity” and multidimensional immensity (in territorial, demographic, and historical terms), has increasingly captured the world's attention in recent years. It should, therefore, come as no surprise that, according to the tracking by the Global Language Monitor of more than 50,000 media sources worldwide, China's rise figured as the most read-about news in the first decade of the twenty-first century.²

Interestingly, the current and ever-growing attention paid by the general public and global leaders to China seems to perpetuate the debate that arose in the aftermath of Europe's rediscovery of the Central Kingdom. Just like the contradictory views expressed by Voltaire and Montesquieu, our time is simultaneously generating divergent, and even conflicting interpretations. Portmanteau words such as “coopetitive relations” and “congement” have, for instance, made their entry into current academic and political debates, demonstrating the inherent difficulty of finding a fixed consensus on what China's resurgence means for the world.

These conceptual and analytical ambiguities are also dramatically mirrored in the space arena, where Beijing's ambitious space programme has increasingly seized the imagination of the global space community, generating as much positive expectation as apprehension and angst.

Of course, all the leading space powers are fully aware that China's ascendancy as a space power represents a significant and potentially disruptive occurrence that can no longer be ignored. If a large part of the debate has so far focused on the geopolitical implications of its ascendancy and on the perils this might hold for the sustainability of space activities, the impressive achievements of this relatively new space actor have also dramatically raised the question of the ensuing cooperation possibilities. Particularly at a time when the undisputed leadership of the USA seems to be faltering or at least face a serious “crisis of identity”, and all the traditional space powers are undergoing a period of prolonged austerity, much thought is going into whether China could also be an auspicious partner in the costly and demanding area of space exploration. A comprehensive reflection on how to best deal with (and benefit from) Beijing's arrival on the international space scene has thus become a necessity.

This book is about China's ambitions in its most complex and internationally visible space endeavour, namely, its human space exploration programme. It will provide a comprehensive reflection on China's strategic direction and objectives in space, including in particular those set forth in its human spaceflight programme, and will analyse the key endogenous and exogenous factors that are bound to affect the country's presumed manned lunar ambitions.

²“Top News Story of the Decade”. Global Language Monitor. 9 December 2009. Web. <http://www.languagemonitor.com/top-words-2/top-news-stories-of-the-decade/>

However, the focus will not be on China's space exploration programme as such. While it is essential to provide a better understanding of China in order to avoid reductive and potentially misleading interpretations and hence have tools to better engage with the country, the objective is to disentangle the opportunities and challenges China's space ambitions are creating for other spacefaring nations and for Europe in particular. The book will therefore include an in-depth analysis of possible European postures towards China in space exploration and will attempt to stimulate a debate on future space strategies in a broader geopolitical context.

The book is comprised of eight chapters. The next chapter will provide an introductory overview of the fast-developing and increasingly complex Chinese space programme. Attention is paid in particular to its organisational set-up, budgetary allocation, and technological capabilities, as well as to its policies and long-term strategies. China's space programme appears to be one of the most complex and opaque in the world and the difficulties encountered when navigating the ocean of its organisational and bureaucratic structures have often raised fears and fuelled speculation. Providing new tools and perspectives to reach behind the public facade of China's space programme represents the underlying objective of the chapter.

Chapter 3, "Why the Moon?", provides a detailed investigation of the rationales and objectives guiding China's leaders towards a possible manned lunar exploration programme. The analysis seeks to provide a better understanding of the underlying philosophy of China's space programme and, more broadly, China's sociopolitical behaviour, besides the pervasive but too reductive interpretation of a strategic confrontation between a *fast-rising power* and a *declining hegemon*. In fact, overemphasis on an inevitable confrontation between the two juggernauts, China and the USA, can only encourage a simplistic interpretation that would hinder understanding of the multifaceted purposes of China's space programme, many of which are historically and culturally derived behaviours. The intent of the analysis is to provide a window in understanding China's plans and intentions from *their* perspective and thus to permit better engagement with the country. Indeed, in considering China's motivations to send its taikonauts to the Moon, the possibilities for international cooperation in this pursuit may become more visible.

The objective of Chap. 4 is to assess China's long-term ambitions for a manned lunar landing. The analysis is comprised of two main sections. In the first, an extensive review of the precursor functional programmes for embarking upon a lunar endeavour—in particular of the manned spaceflight programme and of the lunar exploration programme—is provided. This will in turn be used as a basis for discussing the current state of play of Chinese lunar plans. More specifically, the second part of the chapter will set out considerations of the skills and hardware development required for the implementation of the programme and an assessment of how the overall organisation of this programme might be managed and structured. Some reflections on the potential mission configuration will also be provided.

Chapter 5 shifts the focus to an examination of what can be regarded as the "conditioning factors" for securing Chinese success in the reconquest of the Moon. It is in fact quite evident that concrete plans and strong motivations for reaching the Moon are not, on their own, sufficient for the country to send its taikonauts there. The high complexity of a manned lunar exploration programme involves a number

of conditioning factors and prerequisites that must be fulfilled in order to succeed. By considering “China going to the Moon” as a dependent variable, we can identify the series of independent variables that could ultimately affect China’s capacity to carry out its manned lunar exploration programme. The chapter identifies four macro-variables influencing the country’s space ambitions—socio-economic, political, technological, and international. Chapter 5 focuses on what can be regarded as endogenous conditioning factors, while Chap. 6 will assess the international ones. Rather than predicting the future of China in each of these domains, the different sections of the chapter aim to assess why, how, and to what extent the variables considered could affect a manned lunar exploration programme. These conditioning factors will eventually be summarised in the last section, which will also try to answer the question of whether China can or cannot go to the Moon on its own and discuss why it might not be willing to embark upon a solo mission.

International variables are then assessed in Chap. 6, “China, the Moon and the World”. The main aim of this chapter is to investigate how a Chinese determination to go to the Moon would affect the rest of the international institutional landscape in the period leading up to the country getting there. At the start the chapter will reflect on the *nature* and the *extent* of China’s impact on the global space community and hence provide an account of the posture the leading space powers could adopt vis-à-vis its ambitions in space. In doing so, the chapter will in particular elaborate on the much-discussed scenario of an intra-Asian space race (between China, Japan, and India) and of a Sino-American space race. The various sections will, however, also seek to accompany the analysis with suggestions of a limited amount of scenario alternatives at the various junctures, where more cooperative pathways for space exploration might eventually become possible.

The final chapter, “Europe and China in Space: Constraints, Opportunities and Options”, will specifically elaborate on the opportunities and challenges China’s possible lunar ambitions are raising for Europe and will provide an assessment of the different strategies available to European stakeholders in this regard.³

Given the inherent geopolitical dimension of space activities, the chapter will first provide an assessment of the most recent evolution in the broader political relationship between Europe and China. An account of the long-standing framework of cooperation in space activities between China and different European institutions will subsequently be provided. The two analyses will in turn be used as a basis for a strengths, weaknesses, opportunities, and threats (SWOT) analysis of potential Sino-European cooperation with regard to human space exploration and to identify a set of policy options for Europe. Finally, a qualitative assessment of the various options and a series of recommended actions for European stakeholders will be provided.

³ Within this study Europe is regarded and examined as a unified, though *sui generis*, internationally acting body, whose *space actorness* results from the complex interplay of three main constituencies (ESA, EU, and their member states).

The book closes with an epilogue reflecting on the potential contribution that a major European initiative in space exploration could bring to the contemporary quest for a new global order.

It is the author's hope that this study will contribute to promoting a better understanding of China's posture in the international space arena and stimulate further reflections on this complex and exceedingly relevant topic.

Chapter 2

China's Space Programme: An Overview

This chapter provides an introductory overview of China's fast developing and increasingly complex space programme. The analysis is performed according to a categorisation created by Jim Dator,¹ who developed a framework to understand the process of technology advancement. In his view, all technological areas of development—including space programmes—can be understood as a product of three components: *hardware*, *software*, and *orgware*.

The term *hardware* in this categorisation refers to the material resources and technological capabilities of a space programme. It basically makes up the national capacities in terms of space systems (e.g. launchers, satellites, and ground facilities) and budgetary expenditures. *Orgware*, on the other hand, comprises the organisational structures set up to develop and run the hardware. The *software* of the space programme denotes the norms and rules applied to use the technological capabilities for specific purposes. These are captured in the national space policies and strategies.

In line with this taxonomy, particular attention will be paid to the organisational set-up of China's space programme, to the budgetary allocation, and to the space policies and long-term strategies adopted by Beijing. Specific consideration of China's technological capabilities will be provided in Chap. 4.

¹ Dator, Jim (1983). "Loose Connections: A Vision of Transformational Society". In: Masini, Eleonora (ed). *Visions of Desirable Societies*. Pergamon Press, Oxford. Dator's categorization has been successfully adopted and applied to the analysis of space programmes also by space policy analyst Stacey Solomone. See Solomone, Stacey (2013). *China's Strategy in Space*. Springer, New York: pp. 17–22.

2.1 Organisation of Space Activities in China

China's space programme is one of the most complicated and non-transparent in the world, and understanding its organisational and bureaucratic structures can involve significant difficulties.

These difficulties are not just a result of the high level of secrecy surrounding the programme; rather, they are determined by the combination of secrecy with other four main features, which are (a) the existence of a "Byzantine maze" of bureaucratic structures that involve a myriad of organisations, as well as countless organisations within organisations²; (b) the general complexity of the inner workings of China's power structures and hierarchies; (c) the multiple restructurings, renaming, and relocation of bureaucratic offices and institutes that have occurred through the past 50 years in the Chinese space organisation; and (d) the continuous expansion of space governance in terms of the creation of new administrative entities designed to respond to the needs of new programmes and missions.

The combination of these multiple factors not only confuses any attempt to correctly pair the various institutions, and eventually to peer into the inner workings of the Chinese system, but also raises many fears and fuels speculation. It has even been noted that often "the renaming, relocation, and lack of transparency within organisations has left employees themselves unaware" of their office's position within the overall organisational structure.³

The following section can thus only be an attempt to assess the functions and responsibilities of the most important, large, and central organisations currently involved in the governance of China's space programme.

2.1.1 A Leading Small Group on Space?

In order to reach behind the public facade of the governance of China's space programme, an insight into the structures of power and working relationships of the leadership system is provided first of all.

The first point to note is that the governance regime of the People's Republic of China (PRC) consists of three major vertical systems (*xitong*): the Chinese Communist Party (CCP), the government, and the military.⁴ The three systems operate

² Johnson-Freese, Joan (1998). *The Chinese Space Program. A Mystery Within a Maze*. Krieger Publishing Company, Malabar, FL.

³ Cheng, Dean, and Kerry Murray (2001). "Orbital Dragons: Implications of Chinese Access to Dual-Purpose Space Technologies". In: Williamson, Ray A. *Dual-Purposes Technologies: Opportunities and Challenges for US Policymaking*. Space Policy Institute. Washington DC: p.72.

⁴ Ning, Lu (2001). "The Central Leadership, Supraministry Coordinating Bodies, State Council Ministries, and Party Departments". In: Lampton, David M. (ed). *The Making of Chinese Foreign and Security Policy in the Era of Reform*. Stanford University Press, Stanford: pp. 45–49.

in a symbiotic relationship, but the role and power of the CCP—and of its Central Committee in particular—are ultimately the most prominent, and its overwhelming presence continues to overshadow the entire system. For this reason, China's leadership system has been correctly described as centred on a party-based, oligarchic, consensus-driven structure that reflects a balance among the institutional interests of its three organisational pillars.⁵

In order to build consensus on issues that cut across the government, party, and military systems and to develop rational, coherent, and balanced decision-making, high-level coordinating and consulting bodies have regularly been set up. These bodies, usually labelled Leading Small Group (LSG, *lingdao xiaozu* in Chinese), provide a mechanism for top decision-makers to exchange views on sensitive issues, build consensus, and create a framework for the general direction in which the subordinate bureaucracies should move. As noted by the US scholar Alice Miller, because these groups deal with sensitive leadership processes, they are never incorporated into publicly available charts or explanations of party/government/military institutions, but their existence has to be nonetheless acknowledged and their role ultimately considered crucial in any coherent policymaking elaboration on sensitive issues.⁶

LSGs do not generally formulate concrete policies, but create—through the provision of recommendations and guiding principles—the framework for their development. As noted by several scholars, these recommendations are likely to exert considerable influence on the policymaking process because they are an expression of the consensus reached by the leading members of the relevant government, party, and military agencies. In some cases, the Chinese leadership will adopt an LSG's recommendations with little or no modification.

An important feature of these high-level coordinating bodies is that they can be formed not only to build consensus on issues that cut across the government, party, and military systems but also on sensitive issues involving different interests within one of these three systems. In short, the State Council, the Central Committee of the CCP, and the People's Liberation Army (PLA)—respectively, the highest ranking organs of the government, the party, and the military—often create their own leading groups to coordinate policies.

LSGs are formed in regard to a broad range of issues; examples include foreign affairs, finance and economic affairs, national energy resources, environmental protection, and agricultural affairs. Sometimes, these groups are also formed with regard to specific issues, such as the LSG for the 2008 Olympics set up by the State

⁵ Swaine, Michael D. (2012). "China's Assertive Behavior Part Three: The Role of the Military in Foreign Policy". China Leadership Monitor No. 36. Hoover Institution.

⁶ The practice of creating Leading Small Groups has become so relevant for China's policymaking processes, that these groups are now considered the most important national coordinating bodies and the centres of cross-ministry negotiation and consultation. Miller, Alice (2008). "The CCP Central Committee's Leading Small Groups". China Leadership Monitor No. 26. Hoover Institution.

Council, or the LSG for the Lunar Probe Project, jointly established by the State Council and the Central Military Commission of the CCP in February 2004.⁷

Considering the widespread utilisation of LSGs for the management of sensitive issues and the political, economic, and strategic significance that space activities have for China, it is highly plausible to also envisage the existence of a high-level LSG for the overall coordination of space activities.

Notwithstanding the absence of official documents and the dearth of extensive analysis in this regard,⁸ the necessity and plausibility of a “Space Leading Group” (SLG) is reinforced in particular by the simultaneous involvement of different key stakeholders in the management of the space programme.⁹

Such an SLG would not only be intended to serve as an oversight body and arena for consensus building among the leading members of the relevant government, party, and military agencies; it would also form the core programmatic leadership of China's space programme. The members of the SLG would be senior officials of the CCP, the PLA, and the government, including the prime minister and high-level representatives of the different ministries involved in the programme (e.g. the Ministry of Foreign Affairs, the Ministry of Industry and Information Technology, and the Ministry of Finance).

Like the other LSGs, the SLG is unlikely to formulate concrete policies, but more likely provides the various stakeholders with a series of recommendations and guidelines about the general direction, which the various stakeholders have to respect.

2.1.2 The State Council and SASTIND

Among the major stakeholders under the shadow of an SLG, a primary role would be played by the State Council, which is the highest ranking government organ. The State Council mainly exercises its authority over national space affairs through its ministries and by having the final word on funding decisions for programmes. In addition, the State Council issues the five-year space plan—in the form of a government White Paper—defining the medium-term national strategy in space.

⁷ *Ibid.*

⁸ Only little analysis in the literature has so far acknowledged the possible existence and role of a Space Leading Group. One of the first is provided by the Chinese scholar Yanping Chen in an article published by *Space Policy* in 1993 (“China's space commercialisation effort. Organisation, policy and strategy”. *Space Policy* Vol. 9 (1). 1993: 45–53). The SLG is also mentioned, although not extensively explained in the books of Joan Johnson-Freese (*The Chinese Space Program. A Mystery Within a Maze*. Krieger Publishing Company, Malabar, 1998) and Brian Harvey (*China in Space. The Great Leap Forward*. Springer, New York, 2013).

⁹ The likelihood of an SLG is also reinforced by the acknowledged creation of an ad hoc LSG for the management of specific highly sensitive space projects like Shenzhou and Chang'e.

The State Administration on Science, Technology and Industry for National Defence (SASTIND) is the main administrative body under the State Council tasked with coordinating and managing the country's space activities. It was created through the March 2008 reforms of the State Council that “consolidated and rearranged a number of existing government bodies into larger ‘super-ministries’”.¹⁰ These reforms dismantled the Commission on Science, Technology and Industry for National Defence (COSTIND) and shifted most of its responsibilities and personnel to the newly established SASTIND.

Unlike COSTIND, SASTIND is no longer an organisation under the direct authority of the State Council, but has become part of the super-Ministry of Industry and Information Technology (MIIT). Its main role is to act as the administrative and regulatory hub for the general aspects of China's defence and aerospace industry (in particular development, procurement, and supply). Concretely, SASTIND issues space and defence industry regulations and monitors their implementation, allocates R&D funds through research programmes—which are supervised in collaboration with the Ministry of Science and Technology (MOST) and presumably also with the Ministry of Finance (MOF)—and determines which enterprises may or may not engage in the research and production of aerospace technologies and systems.¹¹ Specifically, with regard to space activity administration, SASTIND also plays an important role in terms of coordinating space policy and plans for the State Council; it is in charge of executing the main space-related regulations, including the “Measures for the Administration of Registration of Objects Launched into Outer Space”.¹²

2.1.3 *The China National Space Administration*

Under SASTIND in the hierarchy, the China National Space Administration (CNSA) formally holds responsibility for “defin[ing] the national space policies, administer[ing] the civilian space programme and manag[ing] the development of

¹⁰ Francis, Ed, and Susan M. Puska (2010). “Contemporary Chinese Defense Industry Reforms and Civil-Military Integration in Three Key Organizations”. Study of Innovation and Technology in China. Policy Brief No. 5. Web. <http://igcc.ucsd.edu/assets/001/500870.pdf>. Accessed 18 January 2014.

¹¹ *Ibid.*

¹² In the measures, it is for instance specified that COSTIND (SASTIND) is in charge—together with Ministry of Foreign Affairs—of the national registration of space objects (art. 4). SASTIND is also responsible for maintaining the National Register. See “Measures for the Administration of Registration of Objects Launched into Outer Space”. Unofficial translation by the Faculty of International Law of China University of Science and Law. 8 February 2001. Available at: http://www.spacelaw.olemiss.edu/library/space/China/Laws/JSL_33.2_China%20Law.pdf. For a commentary, see Ling, Yan (2008). “Comments on the Chinese Space Regulations”. Chinese Journal of International Law. Vol. 7 (3). Web. <http://chinesejil.oxfordjournals.org/content/7/3/681.full.pdf>.

national space science, technology and industry”.¹³ Although CNSA appears on paper to be a fully fledged national space agency, it would be erroneous to consider it as such. In spite of having a name similar to that of its better-known US counterpart, the CNSA in fact is not an all-encompassing space agency, tasked with similar responsibilities and functions to those exercised by the space agencies of the major spacefaring nations.

Rather, the CNSA appears to be, in essence, a clearing house carrying out only a few tasks, namely, serving as the public international face of China's space programme and, second, acting as the liaison office between SASTIND and the aerospace industries. It should be recalled that CNSA was established in 1993 along with the China Aerospace Corporation (CAC) to replace the dismantled Ministry of Aerospace Industry. The underlying intention was to provide the country's space programme with a visible governmental face and apparently to separate space-related governmental functions (theoretically to be assigned to the CNSA) from industrial ones (assigned to CAC). In fact, many of the administrative and managerial responsibilities and functions of this defunct ministry have remained inside CAC. As a result, CNSA's role has remained rather narrow: it has ended up operating as a liaison office between SASTIND and CAC, besides serving as the public face of China's space programme internationally, working with foreign national space agencies.

In sum, while CNSA can be seen as China's external space policy organisation, carrying out China's international obligations and representing the country in international organisations and events (e.g. the ISECG), CAC can be seen as a more powerful internal complement, wielding real power over national space programme matters.¹⁴ Perhaps, these two organisations should really be viewed as one large agency which, not by chance, shares both personnel and management, as well as a very similar logo. A more detailed description of CAC (now restructured as CASC and CASIC) and the aerospace industry's role is provided later in this section.

Confirmation of CNSA's limited role comes from the fact that CNSA is not responsible for the elaboration of the Five-Year Guidelines on space activities, these Guidelines falling within the same framework as China's overall national economic development plans and being decided at the highest political level. Even the derived document, the “White Paper on China's space activities”, is not issued by the CNSA but by the State Council on the basis of the targets envisaged in the Five-Year Plan and subsequently released by its Information Office.

¹³ See “Organisation and Functions”. China National Space Administration. 20 February 2013. Web. <http://www.cnsa.gov.cn/n615709/n620681/n771918/index.html>.

¹⁴ Cheng, Dean, and Kerry Murray (2001). “Orbital Dragons: Implications of Chinese Access to Dual-Purpose Space Technologies”. In: Williamson, Ray A. *Dual-Purposes Technologies: Opportunities and Challenges for US Policymaking*. Space Policy Institute. Washington DC.: p.74.

2.1.4 The China Satellite Launch and Tracking Control General

Compared to CNSA, a more substance-orientated organisation under the authority of SASTIND is the China Satellite Launch and Tracking Control General (CLTC). This organisation, headquartered in Beijing, directly controls and oversees the country's space missions and projects, including its launch infrastructure (thus the three launch sites of Xichang, Jiuquan, and Taiyuan and the forthcoming launch centre of Wenchang), as well as the hub of China's telemetry, tracking, and control (TT&C) network, the Xi'an Satellite Control Centre (XSCC).¹⁵ Although the CLTC falls under the civilian authority of SASTIND, it is run by the General Armament Department (GAD) of the PLA for both the military and civil space programmes. This civil–military mixture in the governance of the CLTC can ultimately be regarded as evidence of the aforementioned intricate web of functions and responsibilities surrounding the Chinese space programme. It clearly shows how the different dimensions (civil, military, commercial, and academic) of the programme—although not fully integrated—are hardly distinguishable.¹⁶ Additional information on China's TT&C network, control centres, and launch sites will be provided in Sect. 4.2.

2.1.5 The General Armaments Department of the PLA

The General Armaments Department (GAD) is one of the four departments of the PLA operating under the control of the Central Military Commission (CMC).¹⁷ It is primarily in charge of managing the procurement and acquisition of weapon systems for the PLA and ensuring defence industry core capabilities. These essential tasks, however, give GAD a broad portfolio of administrative functions and responsibilities. Besides acting as the defence industry's main customer, GAD has also widely engaged with the defence and aerospace industry as regulator, in particular in terms of R&D and production programme management. This role is exercised together with SASTIND on a complementary and peer-to-peer basis. It should be noted, however, that, although GAD and COSTIND were once of equal bureaucratic rank, since the March 2008 reforms and the subsequent subordination

¹⁵ “China Satellite Launch and Tracking Control General”. Nuclear Threat Initiative. 20 January 2014. Web. <http://www.nti.org/facilities/124/>.

¹⁶ Solomone, Stacey (2013). *China's Strategy in Space*. Springer, New York: p. 21.

¹⁷ The other three departments are the General Staff Department, the General Political Department, and the General Logistics Department.

of SASTIND to the MIIT, the new protocol parity is no longer between GAD and SASTIND, but between GAD and MIIT.¹⁸

In collaboration with SASTIND, GAD issues defence industry regulations and monitors their implementation; allocates R&D funds through research programmes, such as the 863 programme, supervised in collaboration with the Ministry of Science and Technology (MOST); and determines which enterprise may or may not engage in the research and production of space technologies and systems.¹⁹

Besides sharing responsibility for the R&D and production programmes of China's aerospace sector and for the administration of space-related infrastructure with SASTIND, GAD is directly responsible for the development of military space capabilities. It also takes part in the management of sensitive space programmes, like human spaceflight. The China Manned Space Engineering (CMSE) Office, which is the bureau of an ad hoc LSG established to manage the Shenzhou manned spaceflight programme, is not by accident headed by a representative of GAD.

This active involvement of the PLA in the management and execution of China's space programme has obviously raised serious concerns and led many Western analysts to assert that the role of the PLA is ultimately the overwhelming one. Reports produced by the *US–China Economic and Security Review Commission* issued for the US Congress have repeatedly emphasised this aspect.²⁰

This claim can be considered accurate insofar as the key infrastructural elements (like launch and tracking facilities) are run and staffed by the military, and a highly visible endeavour such as human spaceflight sees its direct involvement. Affirming that projects are run by the PLA, however, does not automatically imply that they are ultimately decided on and controlled by the military. In fact, not only are core responsibilities shared with other leading stakeholders (e.g. SASTIND, the MOST, and CAS), but key decisions on the implementation of space policies and the overall direction of the programme ultimately reside in the hands of the high-level decision makers of the Party.²¹

In this regard, it must be emphasised that the PLA is far from being an autonomous and independent player within the power structures of the PRC. As mentioned, the GAD is one of the four departments of the PLA operating under the control of the Central Military Commission (CMC) of the CCP, which is the leading organ of the armed forces within the Communist Party. The fact that Xi Jinping,

¹⁸ Francis, Ed, and Susan M. Puska. (2010) "Contemporary Chinese Defense Industry Reforms and Civil-Military Integration in Three Key Organisation". Study of Innovation and Technology in China. Policy Brief No. 5. Web. <http://igcc.ucsd.edu/assets/001/500870.pdf>. Accessed 18 January 2014.

¹⁹ *Ibid.*: pp. 2–3.

²⁰ US–China Economic and Security Review Commission. 2011 Annual Report to Congress. US Government Printing Office, Washington DC, United States. November 2011.

²¹ For this interpretation, see also Kulacki, Gregory, and Jeffrey Lewis. (2009). *A Place for One's Mat: China's Space Program, 1956–2003*. American Academy of Arts and Sciences, Cambridge, MA. See also Harvey, Brian (2013). *China in Space. The Great Leap Forward*. Springer, New York.