

US-CHINA SPACE RACE: FROM GEOPOLITICS TO *ASTROPOLITICS*

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“Let China sleep; when she wakes, she will shake the world.”
(Napoleon, 1817)

Abstract. Following its third manned spaceflight in 2008, China now stands at the pinnacle of the international space hierarchy, next to the United States and Russian Federation. However, while the flights of Yang Liwei and his fellow *taikonauts* have received much media attention, what is less known is the military dimension of its space program. Military space isn't the only domain where China is catching up. While Washington is once again caught in European security issues, following Russia's invasion of Ukraine, China launched, deployed and presently inhabits the Tiangong space station in near Earth orbit. Beijing also has designs on the moon, planning to launch three missions over the course of the next several years as part of the country's lunar exploration program, which aims for crewed landings by the 2030s. This program includes new launch vehicles, a next-generation spacecraft, and a lunar lander. Moreover, the planned lunar missions include a joint base on the surface of the moon with Russia – truly strategic competition in space. Although this is not exactly a Sputnik moment, for some it seems the America is back in October 4, 1957. Hence, it seems that the world must brace for the next great confrontation not only globally but also spatially. This essay briefly examines the space competition between the two superpowers of the 21st century, the United States and China, with a focus on military space programs and on the new concept that will define the geopolitics of the future – *astropolitics*.

Keywords: *US; China; Space Race; Astropolitics; Superpowers Competition*

Inception: A Gathering Storm at the Upper Frontier's Geopolitics

Since 1945 the United States has been the world's dominant power. Even during the Cold War its economy was far more advanced than, and more than

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twice as large as, that of the Soviet Union, while its military capability and technological sophistication were much superior. Following the Second World War, the US was the prime mover in the creation of a range of multinational and global institutions, such as the United Nations, the International Monetary Fund and NATO, which were testament to its new-found global power and authority. The collapse of the Soviet Union in 1991 greatly enhanced America's pre-eminent position, eliminating its main adversary and resulting in the territories and countries of the former Soviet bloc opening their markets and turning in many cases to the US for aid and support. Never before, not even in the heyday of the British Empire, had a nation's power enjoyed such a wide reach. The dollar became the world's preferred currency, with most trade being conducted in it and most reserves held in it. The US dominated almost the entire key global institutions and enjoyed a military presence in every part of the world. Its global position seemed unassailable, and at the turn of the millennium terms like 'hyperpower'¹ and 'unipolarity'² were coined to describe what appeared to be a new and unique form of power.

However, the beginning of the 21st century is witnessing an historic change that, though still relatively in its infancy, is destined to transform the world. For the first time in decades, the United States has a real competitor, both economically and in terms of global ambitions. John Ikenberry argues that the present American-created international order has the potential to integrate and absorb China rather than instead being replaced in the long run by a Chinese-led order.³ This is a crucial barometer of what the rise of China might mean. Hitherto, the arrival of a new global hegemon has ushered in a major change in the international order, as was the case with both Britain and then the United States. Given that China promises to be so inordinately powerful and different, it is difficult to resist the idea that in time its rise will herald the birth of a new international order.

One of the areas in which the US-China competition will take place is space. Although Beijing has made the most space launches in 2021⁴, 55 compared to the 51 American ones, for now, the US are the most advanced space power in the world. Of the more than 4,500 satellites in orbit today⁵, more than half of them are American, some 2,700 satellites and nearly seven times as many as its main competitor, China. Yet, the number of launches only tells part of the story, because the US has more powerful rockets, able to deliver more payloads – satellites,

¹ Martin Jacques, *When China rules the world: the rise of the middle kingdom and the end of the western world*, New York: Penguin Press, 2009, p. 31.

² *Ibidem*.

³ John G. Ikenberry, "The Rise of China and the Future of the West: Can the Liberal System Survive?", *Foreign Affairs*, January/February, 2008. Available at <https://www.foreignaffairs.com/articles/asia/2008-01-01/rise-china-and-future-west> [Accessed at January 8, 2022].

⁴ Leo Bruce, "China completes 2021 with military TJSW-9 satellite launch", *NASA Spaceflight*, December 29, 2021. Available at <https://www.nasaspaceflight.com/2021/12/china-tjsw-9/> [Accessed at March 10, 2022].

⁵ *** "UCS Satellite Database", *Union of Concerned Scientist*, January 1, 2022. Available at <https://www.ucsusa.org/resources/satellite-database>. [Accessed at March 10, 2022].

space probes, and spacecraft – into orbit⁶. China's space funding has increased noticeably in recent years, to \$8.9 billion in 2020⁷, but it still spent a mere fraction of the United States' \$48 billion⁸. It should also be noted that while the private aerospace industry is growing in the US, with firms like Blue Origin and SpaceX and visionaries that are investing tremendous amount of money into the US space economy, in China the sector is stagnating. China's space program has made significant advances in recent years, from completing its "own global satellite navigation system and collecting lunar samples to landing a spacecraft on Mars and sending astronauts to its own space station."⁹ But these milestones should serve as a reality check: the US is not falling behind in the space race, so much as China is steadily catching up after having started so far behind.

Likewise, China's space ambitions are impressive, with plans to develop satellite mega-constellations and further explore the moon and deep space, but each of these Chinese space endeavours will need to first clear significant technical and other obstacles. For example, in June 2021, Beijing released a roadmap¹⁰ for an International Lunar Research Station to be developed jointly with Russia.¹¹ This plan requires China to field the Long March 9¹², a super heavy-lift rocket that has been in the research-and-development phase since 2011. The Chinese expect it to make its first test flight around 2030, but their troubles with other heavy rockets suggest that ambitious goal could well be pushed back. Even then, China landing its astronauts on the moon hardly constitutes a great victory. After all, the US won that race decades ago, in 1969.

Still, the China space-race narrative has helped to arouse anxieties in Washington. The alarm associated with "falling behind"¹³ in the space race is invariably paired with calls for the US to spend more on new space military capabilities, space exploration, and the commercial space industry. Steve Kwast, a retired Air Force lieutenant general, warned, "there won't be many prizes for second place"¹⁴ and urged Washington to act with greater "urgency and

⁶ Todd Harrison *et al.*, "Escalation and Deterrence in the Second Space Age", *CSIS Aerospace Security Project*, October 3, 2017. Available at <https://aerospace.csis.org/escalation-deterrence-second-space-age/> [Accessed at March 11, 2022].

⁷ *** "Euroconsult's flagship research shows government space program budgets have maintained growth trajectories", *Geospatial World*, December 15, 2020. Available at <https://www.geospatialworld.net/news/euroconsultsflagship-research-shows-government-space-program-budgets-have-maintained-growth-trajectories/> [Accessed at March 15, 2022].

⁸ *Ibidem*.

⁹ Kelly A. Grieco, "The China-US Space Race Is a Myth", *The Diplomat*, January 19, 2022. Available at <https://thediplomat.com/2022/01/the-china-us-space-race-is-a-myth/> [Accessed at March 15, 2022].

¹⁰ Andrew Jones, "China, Russia reveal roadmap for international moon base", *Space News*, June 16, 2021. Available at <https://spacenews.com/china-russia-reveal-roadmap-for-international-moon-base/> [Accessed at March 15, 2022].

¹¹ *Ibidem*.

¹² Andrew Jones, "China Aims for a Permanent Moon Base in the 2030s", *IEEE Spectrum*, September 22, 2021. Available at <https://spectrum.ieee.org/china-aims-for-a-permanent-moon-base-in-the-2030s> [Accessed at March 17, 2022].

¹³ Bryan Bender, "'We're falling behind': 2022 seen as a pivotal lap in the space race with China", *Politico*, December 31, 2021. Available at <https://www.politico.com/news/2021/12/31/2022-space-race-china-us-526271> [Accessed at March 20, 2022].

¹⁴ Steve Kwast, "There won't be many prizes for second place", *Politico*, August 10, 2018. Available at <https://www.politico.com/story/2018/08/10/space-race-kwast-768751> [Accessed at March 16, 2022].

excitement.”¹⁵ But much like the missile gap of the late 1950s, such an exhortation encourages a massive militarization of space and risk misallocating limited defence resources.¹⁶

The US faces real and significant security threats in space, but efforts to develop an effective space strategy must begin with a more clear-eyed net assessment. The promotion of space cooperation with China would also help to dampen hype around a space race. While the Wolf Amendment¹⁷ limits US government agencies, such as NASA, from cooperating with Chinese space agencies, the United States and China stand to mutually gain from collaboration for civil space exploration and science. Excluded from participation in the International Space Station or NASA’s Artemis Accords¹⁸, the Chinese have had little choice but to develop their own space station and lunar base. These parallel space missions create a sense of an inflexible competition and fuel the space race narrative. A handy solution would be scientific cooperation between the US and China, which would alleviate the risk of turning this competition into a zero-sum game. However, the history of international world order – from Westphalia in the 17th century to the liberal order of the 2000s – the cooperation lasted only as long as a common threat remained both present and manageable. Nowadays, the cooperation is fraying for many reasons, but the underlying cause is that the threat it was originally designed to defeat – Soviet communism – disappeared more than three decades ago. Until now, none of the proposed replacements of the current order have struck “because there hasn’t been a threat scary or vivid enough to compel sustained cooperation among the key players”¹⁹. And as long as the new threat is posed by China itself, it is unlikely that the United States will be inclined to share the grand prize precisely with the big emerging competitor. So the international system should brace for the next competition that will exceed the terrestrial landmarks and it is set to be launch to the upper frontier.

Foundation: From Geopolitics to Astropolitics

Given China’s vast territorial ambitions that span global waters from the South China Sea to the Indian Ocean to the Arctic, President Xi Jinping’s 2013

¹⁵ *Ibidem*.

¹⁶ Kelly A. Grieco, 2022, *op. cit.*

¹⁷ In 2011, Representative Frank Wolf (R-VA) introduced what is now commonly referred to as the Wolf Amendment into the annual commerce, justice, and science (CJS) appropriations bill. This amendment limits US government agencies, such as the National Aeronautics and Space Administration (NASA), from working with Chinese commercial or government agencies. While the amendment does not prohibit all collaboration between the US and China, the result has proven to be a significant hindrance to bilateral civil space projects. See: H:\FY20\BILL AND REPORT\FY20CJSCHAIRMANMARK.XML. Available at <https://appropriations.house.gov/sites/democrats.appropriations.house.gov/files/FY2020%20CJS%20Sub%20Markup%20Draft.pdf> [Accessed at March 17, 2022].

¹⁸ “The Artemis Accords” are an international agreement between governments participating in the Artemis Program, an American-led effort to return humans to the Moon by 2025, with the ultimate goal of expanding space exploration. See: “The Artemis Accords”, NASA.GOV. Available at <https://www.nasa.gov/specials/artemis-accords/img/Artemis-Accords-signed-13Oct2020.pdf> [Accessed at March 17, 2022].

¹⁹ Michael Beckley, “Enemies of My Enemy. How Fear of China Is Forging a New World Order”, *Foreign Affairs*, March/April, 2022, p. 68.

announcement did not come as a surprise. Almost ten years ago he promised that the nation would send a *taikonaut*²⁰ to the moon by the 2030s. As with the other policies that Xi has shaped as his forthcoming legacy, there has been a strict follow-through, with the nation's aerospace experts improving their craft at dizzying speed. As of 2022, 14 Chinese nationals have flown into space. Few years later, in 2017, the head of the Chinese lunar exploration program, Ye Peijian, has remarked that: "the universe is an ocean, the moon is the Diaoyu Islands, Mars is Huangyan Island. If we don't go there now even though we're capable of doing so, then we will be blamed by our descendants. If others go there, then they will take over, and you won't be able to go even if you want to. This is reason enough."²¹

His reference to the Senkaku Islands (Diaoyu Islands) and Huangyan Island (Scarborough Shoal) suggests that China sees space in terms of astrostrategic terrain: the moon and Mars are places of astropolitical importance, rather than simply the focus of scientific exploration. Just as China sees control of the "first island chain"²² in East Asia as vital to its maritime security, Ye's comment suggests that these high grounds in space will bear directly on Chinese strategic interests in the coming decades. The Chinese are also building high-end satellites for developing countries and shares satellite data to help with relief work after natural disasters. As of 2008, China has signed space-related cooperation agreements with Argentina, Brazil, Canada, France, Malaysia, Pakistan, Russia, Ukraine and the European Commission and in September 2021 Russia and China tentatively agreed to open a joint lunar research base, making both sides more influential.²³

On the other hand, Washington is taking steps to ensure that the West isn't pushed out of space entirely. The establishment of the Space Force and the re-establishment of Space Command are two signs that the US is taking China challenge seriously and prepare for space as a war-fighting domain. However, for the US feels like a time travel. China's ambitions are not exactly a Sputnik moment – a truly overused cliché – but it is the spirit of Sputnik that gives shivers to those promoting the American exceptionalism. China is racing ahead in space while the US is resting on its previous accomplishments, impressive though they are. The reality is that it is quite difficult for the US, in the context of 2022 – post-pandemic, domestic issues, or external, such the invasion of Ukraine by Russia – to divide its resources on so many fronts. Thus, the US is once again forced to postpone its 2012 Pivot to Asia strategy and turn its attention to the

²⁰ The name used in the west for a Chinese astronaut. It comes from the Chinese word 'taikong' meaning space or cosmos. The official Chinese name is "yuhangyuan", meaning 'travelers of the Universe'. See: *A Dictionary of Space Exploration*, online edition, 2018, Oxford University Press. Available at <https://www.oxfordreference.com/view/10.1093/acref/9780191842764.001.0001/acref-9780191842764> [Accessed at February 27, 2022].

²¹ Brendon Hong, "China's Looming Land Grab in Outer Space", *Daily Beast*, June 22, 2018. Available at <https://www.thedailybeast.com/chinas-loomng-land-grab-in-outer-space?ref=scroll> [Accessed at March 15, 2022].

²² Malcom Davis, "China, the US and the race for space", *The Strategist*, July 12, 2018. Available at <https://www.aspistrategist.org.au/china-the-us-and-the-race-for-space/> [Accessed at March 19, 2022].

²³ Ralph Jennings, "In China-US Space Race, Beijing Uses Space Diplomacy", *VOA News*, October 25, 2021. Available at <https://www.voanews.com/a/in-china-us-space-race-beijing-uses-space-diplomacy/6284826.html> [Accessed at March 14, 2022].

security challenges facing its European partners. While this moment could revive the concept of the Pax Americana, it could create some frustrations at the decision-making level, as the increasingly discreet US presence in the Asia-Pacific region represents a unique opportunity for China to impose, almost unhindered, both regional and international strategies, as well as President Xi's promise to conquer space.

But even if the geopolitical context is not the most favourable, the US has actually made a number of attempts to offer a "national strategy"²⁴ for space. Arguably, these have taken the form of various national space policies from 1958 to the present. That year, the US under the Eisenhower Administration crafted and passed the National Aeronautics and Space Act. This remarkably comprehensive legislation, best known for dissolving the National Advisory Committee for Aeronautics (NACA) and replacing it with the National Aeronautics and Space Administration (NASA)²⁵, set out a variety of goals for the country in spaceflight and in political, economic, and legal mechanisms for such activity.

President Kennedy's speech on 25 May 1961, on "Urgent National Needs"²⁶ came closer to the concept of strategy by placing space within a more general context of national security priorities and specifying clear, overarching goals for US space efforts. These included: "landing a man on the Moon and returning him safely to Earth"²⁷ within the decade; accelerating "development of the Rover nuclear rocket" for exploration of the solar system; and speeding the "use of space satellites for world-wide communications."²⁸ President Kennedy even provided specific cost estimates for some of these activities and called on all Americans to "pay the price for these programs – to understand and accept a long struggle"²⁹ in order to accomplish these goals. More recently, the Obama Administration's space policy, released on 28 June 2010, changed the parameters for the US government's approach to space by shifting the focus from primarily unilateral means to fundamentally cooperative ones.³⁰ While reaffirming the inherent national right to self-defence, the new policy underlined that the "irresponsible acts in space can have damaging consequences for all of us."³¹ The document outlined further a need for the US to show "leadership in space-related fora"³² and in the "enhancement of security, stability, and responsible behaviour in space."³³

²⁴ James Clay Moltz, "Space and strategy: from theory to policy", in Eligar Sadeh, *Space Strategy in the 21st Century. Theory and policy*, 2013, New York: Routledge, p. 22.

²⁵ James Clay Moltz, 2013, *op. cit.*, p. 23.

²⁶ *Ibidem*.

²⁷ President John F. Kennedy, "Special Message to the Congress on Urgent National Needs," speech before a joint session of Congress, May 1st, 1961. Available at <https://www.jfklibrary.org/Historical+Resources/Archives/Reference+Desk/Speeches/JFK/Urgent+National+Needs+Page+4.htm> [Accessed at March 17, 2022].

²⁸ *Ibidem*.

²⁹ *Ibidem*.

³⁰ The White House, "National Space Policy of the United States of America," 28 June 2010. Available at https://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf [Accessed at March 16, 2022].

³¹ James Clay Moltz, 2013, *op. cit.*, p. 26.

³² Joseph Cirincione, *Bomb Scare: The History and Future of Nuclear Weapons*, 2007, New York: Columbia University Press, pp. 26–27.

³³ *Ibidem*.

Delivering the US and Chinese space strategies in their fullness, is falling beyond the purpose of this essay. Instead, this chapter aimed to introduce the transition from the geopolitics described by Halford Mackinder, toward the new spatial confrontation, described as *astropolitics*, a concept coined by theorists of international relations and used by policy makers or any analyst impassioned about the new global adversity that emerged between Washington and Beijing.

Astropolitics is defined by Everett Dolman as “the study of the relationship between outer space terrain and technology and the development of political and military policy and strategy”³⁴. It contrasts with traditional geocentric approaches to space power, which focus on how space directly influences terrestrial affairs and downplays the vast astrostrategic terrain in *cislunar*³⁵ space (the region between the Earth and the moon). Astropolitics and astrostrategy are big ideas whose time is coming and the Chinese official, Ye Peijian, is clearly thinking long term: Mars is distant and probably won’t be ‘astropolitically’ significant for many decades, but the moon is more important, given its gravitational proximity to ‘near-Earth space’ and its status as the highest natural ground above Earth’s gravity well.³⁶ Dolman relates astropolitics to Halford Mackinder’s early 20th-century ideas about geopolitics, which extend not only to geostrategies focused upon the Eurasian Heartland and the need to contain Russia and China, but modern geopolitics comprehends also more fundamental elements of the geopolitical imaginary, including a view of the world as containing incompatible civilizations, hostile states, intense spatial integration.³⁷ Hence, from *astropolitics* to *astropolitik* is a step just as small as from neorealism to realpolitik.

The Here and Now: Astropolitik – Neorealism Embedded in Space Race

The basic tenets of neorealism enable the systematic approach to studying shifts in state behaviour and Kenneth Waltz designed its most famous approach. In his 1959 book *Man, the State, and War* he explains the causes of war by distinguishing three levels (or “images”): the individual, the state, and the international system.³⁸ On each level can be found causes that lead to international conflict. Neorealism is often associated with realpolitik, as both deal with the pursuit, possession, and application of power. Realpolitik, however, is an older prescriptive guideline limited to policy-making, while realism is a wider

³⁴ Everett Dolman, *Astropolitik. Classical Geopolitics in the Space Age*, 2005, Portland, Oregon: Taylor and Francis, p. 23.

³⁵ Michael Byers, Aaron Boley, “Cis-lunar space and the security dilemma”, *Bulletin of the Atomic Scientists*, January 17, 2022. Available at https://thebulletin.org/premium/2022-01/cis-lunar-space-and-the-security-dilemma/?fbclid=IwAR2-l8C33HnqLssJzL_P5DQNf8rOxDttsU5fsjb689AE3fhvrc89hgYNwVY [Accessed at March 16, 2022].

³⁶ Malcom Davis, 2018, *op. cit.*

³⁷ Gerry Kearns, *Geopolitics and Empire. The Legacy of Halford Mackinder*, 2009, Oxford: Oxford University Press, p. 230.

³⁸ Kenneth Waltz, *Man, the State, and War*, 2018 (originally published in 1959), New York: Columbia University Press, p. 57.

theoretical and methodological paradigm to describe, explain, and predict events in international relations.

The main variables of neorealism – distribution of power in the international system (independent variable), domestic perception of the system and domestic incentives (intervening variable), foreign policy decision (dependent variable) – can be found in nowadays space competition between the US and China and their synergy leads to the future alternative of *realpolitik* – *astropolitik*. *At international system level* this completion is set to override any other global issue in the near future, and depending on its course new fault lines will define the next world order. *The domestic perception of the system and domestic incentives* are different in the US and China. While the Americans are openly criticizing their government and they are applying pressure at the political level to adopt one stance or another, in China the decision is unilateral, top-down, and it is not subject to public opinion. One might argue that the latter system is more beneficial when quick decisions need to be made or when a certain type of policy will not produce an express result. However, on long term, the top-down system is vulnerable to societal movements and a single major unrest can put on hold, or even cancel, all the previous strategies. It takes just one man in front of a tank to shatter a system, even if temporarily. And lastly, to set *foreign policy decision* as dependent variable, it is hypothesized that the allies with convergent interests would find negotiations between themselves more difficult when domestic constraints such as political ideology and pressure group activity intrude. Hence, the foreign policy depends on domestic perception of the international system and on domestic incentives because the basic principle of state survival in the international system is reliant on force and domestic support. A solid internal policy will deliver a firm international stance.

In its narrowest construct, *astropolitik* is the extension of primarily 19th – and 20th – century theories of global geopolitics³⁹ into the vast context of the human conquest of outer space. In a more general and encompassing interpretation, it is the application of the prominent and refined neorealist vision of state competition into outer space policy, particularly the development and evolution of a legal and political regime for humanity's entry into the cosmos. The theory describes the geopolitical bases for power in outer space, and offers suggestions for dominance of space through military means.⁴⁰ And as the new global competition between the US and China takes shape, there are serious premises that the race between the two actors will employ the principles of *astropolitik* and may come to cross the final frontier, and take their rivalry to a new level and engage in a space race that might define the international system for the rest of the 21st century.

Before the beginning of the Operation *Iraqi Freedom*, the US deployed 5,500 Global Position System (GPS) guided munitions⁴¹, positioned more than 100,000 precision lightweight GPS receivers in Iraq, and used 10 times the satellite

³⁹ Everett Dolman, 2005, *op. cit.*, p. 59.

⁴⁰ *Ibidem*.

⁴¹ United States Space Force, "Factsheet Global Positioning System", October 2021. Available at <https://media.defense.gov/2022/Apr/08/2002973442/-1/-1/1/GPS%20FACTSHEET.PDF>. [Accessed at April 1, 2022].

capacity utilized during Operation *Desert Storm*.⁴² The remarkable reliance upon space-based assets was further underlined by the fact that more than 100 military satellites supported the US army during *Iraqi Freedom*.⁴³ The utilization of space-based capabilities “even extended to utilizing the services of the Space Shuttle Endeavour, which produced a three-dimensional radar map of targets in Iraq in February, 2000”⁴⁴. This massive increase in the use of space technology during *Iraqi Freedom* enabled military responses to occur in minutes rather than hours, resulting in a considerable reduction in the “kill-chain”⁴⁵. It was further proof that the Upper Frontier had become the ultimate military high ground.

In turn, the Beijing government has made considerable investments in developing counter-space capabilities, a program that has been accelerated since the 1991 Gulf War. China’s diverse and comprehensive counter-space program includes upgrading its surveillance and identification systems, developing direct attack weapons such as “direct ascent and co-orbital satellites, improving kinetic and non-kinetic means of attack, in addition to exploring directed energy weapons.”⁴⁶

Space-based resources are becoming ever more integral to the national security operational doctrines of the US and China. Capabilities such as reliable, real-time bandwidth communication can provide an invaluable combat advantage in terms of clarity of command intentions. Furthermore, “satellite-generated knowledge of enemy locations can be exploited by commanders to achieve decisive victories, and precision navigation and weather data from space enable optimal force disposition, decision making, and responsiveness.”⁴⁷ In short, to implement doctrines aimed at controlling space and denying the use of space environment to an adversary requires an extensive array of space hardware.

The Day After Tomorrow: Anticipation and Accommodation

When President Richard Nixon and his National Security Adviser Henry Kissinger began exploring an opening to Beijing, no one imagined that in their lifetime China could create an economy as large and powerful as the US one. Their focus was America’s Soviet adversary, and their purpose, to widen the emerging Sino-Soviet split in the Communist bloc. And it worked. Nevertheless, years later, when Nixon reflected on the course of events, he confided to his friend and former speechwriter William Safire, “We may have created a Frankenstein.”⁴⁸ In the three and a half decades since Ronald Reagan became president, by the

⁴² Kaleb Dissinger, “GPS Goes to War – The Global Positioning System in Operation Desert Storm”, *US Army*, February 14, 2008. Available at https://www.army.mil/article/7457/gps_goes_to_war_the_global_positioning_system_in_operation_desert_storm [Accessed at April 2, 2022].

⁴³ *Ibidem*.

⁴⁴ Erik Seedhouse, *The New Space Race. China vs. the United States*, 2010, Chichester: Praxis Publishing Ltd., p. 80.

⁴⁵ *Ibidem*.

⁴⁶ *Ibidem*, pp. 86-87.

⁴⁷ *Ibidem*, p. 80.

⁴⁸ William Safire, “The Biggest Vote”, *New York Times*, May 18, 2000. Available at <https://www.nytimes.com/2000/05/18/opinion/essay-the-biggest-vote.html> [Accessed at April 1, 2022].

best measurement of economic performance, China has “soared from 10 percent the size of the US to 60 percent in 2007, 100 percent in 2014, and 115 percent today. If the current trend continues, China’s economy will be a full 50 percent larger than that of the US by 2023. By 2040 it could be nearly three times as large.”⁴⁹ That would mean a China with triple America’s resources⁵⁰ to use in influencing outcomes in international relations.

Declarations of a new “unipolar era,”⁵¹ and proclamations of the “end of history,”⁵² in which all nations would embrace the American script and take their places as market-based democracies in the US-designed international order, captured imaginations. On this canvas, Communist China was but an afterthought.

Assessing America’s anticipation and “engage but hedge”⁵³ strategy, Lee Kuan Yew identified two fatal flaws. First, China is not about to become a democracy. As he put it straightforwardly, “If it were to do so, it would collapse.”⁵⁴ Second, comparing China to Germany and Japan misses the fact that the latter two were first defeated in a hot war, occupied by Americans troops, and governed for a period thereafter by American high commanders who even wrote their constitutions.⁵⁵ In contrast, in Lee’s words, China will insist on “being accepted as China, *not* as an honorary member of the West (...) The Chinese will want to share this century as co-equals with the U.S.”⁵⁶ And as it turned out in recent decades, the Chinese leaders are political realists;⁵⁷ hence they would not waste their time or resources on a mission impossible. That means it’s important to understand what’s driving Chinese aspirations. If the Beijing government is seeing the space domain in line with Dolman’s astropolitics thesis, Ye’s parallel of the Moon and Mars with strategically contested terrain on Earth should make space thinkers in the West sit up and take notice. Control of the Upper Frontier doesn’t need to end at geostationary orbit, particularly if the Moon and other celestial bodies hold strategic wealth and value, and will be within easier reach by the end of the next decade.

Beijing is competing in every arena and every domain, and this includes space, therefore, if Washington wants to slow down China’s progress, it can try a strategy of accommodation. Critics seek to conflate accommodation it with appeasement. But the two are not synonyms in the realm of strategy. Accommodation is a serious effort to adapt to a new balance of power by adjusting relations with a

⁴⁹ Graham Allison, *Destined for War*, 2017, Boston: Houghton Mifflin Harcourt, p. 471. See also: “Belfer Center estimates, based on data (1980–2016) from International Monetary Fund, *World Economic Outlook Database*, October 2016. Available at <https://data.imf.org/?sk=388DFA60-1D26-4ADE-B505-A05A558D9A42&sId=1479329132316> [Accessed at April 1, 2022].

⁵⁰ Graham Allison, 2018, *op. cit.*, p. 479.

⁵¹ Francis Fukuyama, *The End of History and the Last Man*, 2006, New York: Free Press, p. 254.

⁵² *Ibidem*.

⁵³ Graham Allison, 2017, *op. cit.*, p. 481.

⁵⁴ Graham Allison, Robert D. Blackwill, *Lee Kuan Yew. The Grand Master’s Insights on China, the United States, and the World*, 2013, Cambridge: MIT Press, p. 35.

⁵⁵ *Ibidem*.

⁵⁶ *Ibidem*.

⁵⁷ Kishore Mahbubani, *Has China Won? The Chinese Challenge to American Primacy*, 2020, New York: Public Affairs, p. 35.

serious competitor – in effect, making the best of unfavourable trends without resorting to military means. Accommodation comes in two varieties: ad hoc and negotiated.⁵⁸ There are a number of challenges to the formulation and implementation of space strategy accommodation. Key issues include: the scope and content of the strategy – whether overarching in nature focusing broadly across the security, civil, and commercial sectors, or limited in scope to specific areas of significant overlap that require national-level coordination; and interagency organizational decision-making processes that must address the alignment of resources with policy and agency roles and responsibilities. The scope of accommodation needs to be balanced between an overarching construct versus one that addresses a number of limited crosscutting areas across the national space strategies, but with well-articulated goals.

In 1968, Stanley Kubrick adapted Arthur Clarke's short story "The Sentinel" into one of the signature films of the space age. The script for 2001: A Space Odyssey was co-written by Clarke and Kubrick. Clarke prided himself on technical accuracy, and Kubrick was rigorous, almost fanatical, in his devotion to realism and detail. The film was beyond the Hollywood audacity; the audience was not expected to suspend its disbelief to accept the premise of the story. The entire script was meant to make the viewers believe that everything is at their grasp. According to Great Powers' space strategies, in less than 30 years, the earthlings would have a permanent presence on the Moon, a fully functional giant wheel space station in low-Earth orbit, and regular passenger services to both. This was not the lunatic prophecy of an amateur yarn spinner, making up technical marvels to fill gaps in the story. This was real; it was what NASA and the Soviet space programs would accomplish – easily – before the end of the century.

The new millennium is here. The question is how the world will accommodate the day after tomorrow and to the next competition between the two superpowers.

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⁵⁸ Graham Allison, 2017, *op. cit.*, p. 484.

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