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IS SPACE BIG ENOUGH FOR A US-SINO PARTNERSHIP?

By

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With the recent slowdown in US space activities and the current economic downturn, US advances in space have slowed and are unlikely to turn around in the short term. At the same time, China has made significant advances in both funding and capabilities regarding space, with a large budget and big plans for the future. This paper explores the pros and cons of a possible US-China joint venture and answers the question, 'Is space big enough for a US-SINO partnership?'

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PREFACE

This paper has been an adventure a long time in the making. Ever since my first trip to Asia in 1994, I have known that China would play a significant role in our future. This became increasingly evident during my studies at the United States Air Force Academy, and even more so during my two-year stint as an Olmsted Scholar in Shanghai, China. These experiences combined with my background as an Air Force space professional to create a collision with destiny. Having seen US space programs do amazing things on one side, and worked with the Chinese on many levels on the other, I believe that space is big enough, that there is a future for the US and China in space.

I would like to thank Lt Col Rick Rogers, my research advisor at Air Command and Staff College, for his mentorship and feedback throughout this project and the advanced space research elective. I am also grateful to my classmates for their insight and thought-provoking questions which aided my thesis development. I am indebted to the myriad space professionals who have aided and directed my own development to this point in my career. The list is long, but a few stand out: Cols John Riordan, Jeff Yuen and Cathy Perro; Lt Cols James Quinn, Stan Kekauoha and Linda Cole; and Major Dave Ashley, who continues to push harder and run faster than I can, which is a good thing.

ABSTRACT

China and the United States have a history of disagreeing in many areas. One area that may have been overlooked is the US policy regarding China and the future of US space activities. The current decline in US civil space activity, combined with the recent surge in Chinese space development, demand a response to the questions, What is the US policy on space for the short and long term? How and where does China fit in that policy?

The answers to both questions lie in the same direction: the US should partner with China in future space ventures. This benefits both countries in several areas. First, it makes economic sense from the US perspective to aid our stuggling economy. It also makes sense from China's perspective to purchase technology rather than to reinvent the wheel. From a political perspective, it is a great opportunity to open doors and begin a dialogue between the two countries that may not start otherwise. Once this dialogue has begun, it will be much easier to expand the scope of cooperation, building on that foundation, than it would be to start from scratch. Militarily it may not be the optimum choice to cooperate with a potential adversary, but the goodwill that may be gained and the insight into Chinese space and other military operations may overcome the potential losses. The potential benefits of the three areas combined outweigh the negatives, and make partnership an attractive option worth pursuing.

Is Space Big Enough?

INTRODUCTION

United States policy toward China has varied significantly over the past several decades. We are rapidly coming to a crossroads in our foreign relations stance with regards to China and must therefore make some important policy decisions which will impact our relationship with China indefinitely. One of the most controversial and strategically important areas of consideration is space. Both nations understand the importance of access to and utilization of space now and in the future. Control and utilization of this medium is a critical element of both nations' national security strategies, and each country understands that "who controls Low-Earth Orbit controls Near-Earth Space…who controls Near-Earth Space dominates Terra [earth]."[1] It is essential, therefore that the United States develop an effective strategy for engaging China in this realm.

The purpose of this paper is to review China's rapidly advancing space capabilities and to recommend a method with which to engage China. Regardless of which path we choose, the wrong choice will have serious long term ramifications and will be very difficult to reverse. Worse yet, inaction would simply allow the Chinese the opportunity to surpass the US in terms of space capability. Simply stated, the current lack of a strategic policy with regards to China's space program leaves the US vulnerable to Chinese hegemony in this area. Thus, there are really only two options to consider when engaging China: competition or cooperation.

The first option is competition. We could treat them as a peer competitor, or adversary, and aggressively compete with their space programs and development. Some authors have even suggested that the US militarily control access to space for all but peaceful missions.[2] Still others have argued that we should isolate China and its space program by restricting trade in that

area, forcing them to develop their own technology from scratch. However, the US can ill afford to initiate a space arms race with the Chinese at this point. This option, is therefore not very feasible, so I will focus on the second option, partnership with China.

As partners with China, we could work together to provide benefits for both countries. This path has several significant benefits, to include increased capability to conduct projects due to economic support; an increased dialog with China that may expand into other realms; and increased insight into Chinese internal operations and capabilities. However, it also carries some negative implications, including issues of space situational awareness, space control and military intelligence concerns. If we were to engage China regarding a potential space partnership, these areas would need to be addressed in detail.

THE ISSUE

The problem is that China is rapidly increasing its space capabilities and the US does not have a strategy in place to engage or counter this rise in power. Therefore, engagement via cooperation with China appears to be a better strategy that is more consistent with our national security goals. This strategy will carry with it serious repercussions, which could include being surpassed by China in space, or committing ourselves to an expensive and unwinnable space race.

To establish the geopolitical context for discussing partnership strategy, this paper will first review the background of the Chinese and US space policies. Next it will analyze and compare the potential positive and negative aspects of engaging with China through the lens of economic costs, political impacts, and military concerns. It will then recommend several methods to implement that course of action which are in the best interest of the United States.

BACKGROUND

The current state of political affairs draws US international focus to many areas of the world. As such, our primary focus is on the Middle East with Iraq and Afghanistan as well as Israel and Palestine. Since it is a hot spot where people are dying every day, this area of the world currently occupies the forefront of US foreign affairs as well as the preponderance of discretionary budget outlays. Russia's resurgence also draws significant attention away from other important priorities. In short, there are myriad 'important' concerns throughout the world all requiring 'immediate attention.' As a result, the US policy toward China has been neglected somewhat, specifically regarding national strategy and space. With China's accelerating prominence in space, combined with the significant increase in their military spending, it is essential that the US further define its space policy towards China and decide how it wants to engage them regarding this increasingly important issue. However since the impacts of this policy are not likely to be felt for years, or perhaps decades, the issue is continually pushed aside to make room for the immediate, yet possibly less important, priorities.

CURRENT SITUATION – UNITED STATES OF AMERICA

The United States has long been the preeminent space power for at least the past 50 years. The launch of *Sputnik* was a catalyst that prompted the US to dedicate massive resources and efforts to achieving and maintaining leadership in space. This strategy worked well during the Cold War. Recently, however, without a peer competitor, priority of maintaining US space dominance has begun to wane. The combination of higher priorities in other areas of foreign affairs and a lack of competition has allowed the US to prioritize space behind other geo-political issues. Interests in the Middle East (Iraq and Afghanistan as well as Israel and Palestine) have taken the majority of available resources in both analysts and capital away from space as a

strategic priority. Lacking formal direction, emphasis on space development and progress has been allowed to drift. In nearly all major strategy and policy documents, there is no clear direction as to where space is heading in the immediate or long term future. Neither the National Security Strategy nor National Defense Strategy gives clear guidance to US space programs, and in fact reduces its scope. Space research and development are all but left out of national budgeting plans, with mere maintenance budgets just keeping them alive.

Even the US manned space program, the Space Transport System (STS or Space Shuttle) formerly a source of national pride and prestige, is set to retire in 2010 with a follow-on program that has been plagued with delays and setbacks so much that the US will have no manned space-flight capability for at least seven years.[3] Many of the space manufacturing pipelines kept alive solely by the Space Shuttle program have already been shut down and can only be restarted at great cost in dollars as well as human capital. Budgeting constraints have put NASA, America's civil space laboratory, in a holding pattern. Without significant budget increases in the near future, our human spaceflight capability will dimish, seriously hampering our civilian space development. Add to that the critical reduction of our space industrial base with regards to rocket building and production, and the future of US space capability looks dim.

As space is the last great unknown with respect to exploration, exploitation and utilization, we still have much to learn regarding untapped resources that have the potential to greatly benefit those who can exploit them. Space, therefore, is tied to national power via not only the economic and military benefits it provides, but also the prestige it gives those who are able to reach and act in its medium.[4] Consequently, "China's rise as a space power will present military, economic, and political challenges to the United States."[5]

CURRENT SITUATION – CHINA

China's space capabilities have progressed rapidly in the last 10 years. From putting men in orbit to shooting down an aging weather satellite, it has demonstrated abilities over and above the average space-faring nation. Accomplishing these two feats effectively elevates China to an elite club with only two other members: the United States and Russia. China's robust economy (including its huge cash reserves) and its nuclear capability give it a unique position as an emerging world power that it would not otherwise have been able to attain.[6] In its quest to further strengthen its place in the international forum, China has launched an aggressive space program that has been very successful and made many significant advances. Their sizeable economic resources are a great aid to their space goals. However, their lack of openness causes much speculation and curiosity as to what their true capabilities are and how they were developed. Since military applications of scientific discoveries are generally not separated by very much time, and the US has little insight into Chinese internal operations, the US has significant reason to exercise caution when considering which direction our China Space strategy should take.

While China and the United States have a long history of disagreeing on political and military issues, their economies are inextricably tied together. Space is an area where perhaps the two countries can find common ground to build a meaningful and lasting partnership. There are, however, significant obstacles which must be overcome before such a partnership can be forged.

First, China's direct-ascent anti-satellite (ASAT) demonstration in 2007 proves China's willingness to engage in provocative and dangerous activities without consulting or informing other nations. This act caused immeasurable damage on several fronts, including the obvious

flooding of the orbit with debris that will take decades to clear naturally. This debris cloud is harmful to anyone who wishes to operate in space due to the physical danger of the debris, much of which is too small to identify and track from the Earth, and will be a cause of concern for all space faring nations, China included. More importantly, however, is the good will lost by China's blatant demonstration of an offensive space control capability (or space weapon) with no warning or explanation. Lack of information beforehand combined with a weeks-long silence after the test also indicate a lack of coordination between China's military and political branches, which is a dangerous harbinger for future military as well as space operations.[7]

Conversely, its evolving manned space flight program has demonstrated its ability to advance its capabilities to a higher level of space competency.[8] Recent rapid progress in this very technologically challenging area shows technical advancement and a willingness to take risks that is not seen frequently in the space community. By joining the elite club of countries with manned space flight community, China has taken its space program to a new level and demands a higher level of respect and admiration for doing so. That it came decades after the US and Russia accomplished the feat does not diminish it significantly: it is still a remarkable achievement that demonstrates considerable resolve and commitment to space development.

While China's space program appears healthy, there may be an opportunity to impact its development at this stage. They are at a critical point in their development as they are improving their manned spaceflight capability. China's tradition of 'face' and its strong desire not to make any mistakes that would reflect poorly on its space program ensure that the pace they take is a very slow and deliberate one. This may provide the US an opportunity to engage China.

China has made great strides in its space programs, and has appeared to do so independently. Aspersions cast by questionable practices and dangerous stunts have not halted

their progress. Rather, China seems encouraged by the prospect of reaching milestones that are beyond the grasp of most space-faring nations. It is at this juncture that the US needs to decide how to engage China in space.

THE OPTIONS

According to John Klein, there are four main areas where space plays a significant role: civil, commercial, intelligence and military.[9] Civil applications include those areas involving exploration and scientific research, such as the International Space Station. Commercial roles include those funded by public and private entities for a profit. Telecommunications, data relay services and satellite imagery are just a few of many areas of space applications that are being exploited commercially today. Intelligence missions are generally funded and operated by governments and include missions such as surveillance and reconnaissance or communications relays. Military applications may include all of the above, as well as those utilizing space for offensive or defensive operations, such as space surveillance, ballistic missile warning or ballistic missiles themselves, which transit space.[10]

Each of these areas offers opportunities for cooperation or challenges for potential competition with China as both countries develop and refine our space capabilities. For the purposes of this paper, I will combine the civil and commercial aspects into one heading under economic impacts and will address the intelligence and military areas as one topic as well under a heading of military operations. I will also discuss political impacts to the different strategies of Chinese engagement.

As China develops its space capabilities, questions arise regarding how the US should treat China: Are there areas where we can or should partner with China for mutual benefit?

What are the military, political and economic implications of such a partnership? Should we engage them as an international competitor? Or should we treat China as a space adversary? [11]

The answers to these questions will have far-reaching strategic implications and will impact such documents as our National Security Strategy and National Military Strategy. They will also significantly affect the development of our National Space Policy, from both a domestic standpoint (maintaining the industrial base) and developing foreign policy (how we respond to China). This paper strives to inform the debate so that national policy makers can make correct decisions on both our space program, as well as on our engagement strategy with China. My discussion will focus primarily on the military aspects of a potential Chinese partnership, touching briefly on the economic and political impacts such a course might have on the US and our allies.

DISCUSSION

China is, or would be, a welcome participant in many ventures, but for several drawbacks. These include rampant piracy, perceived unfair trade practices, one-sided foreign affairs stances, and alleged widespread government and business corruption, to name a few. The Loral incident regarding the 'unauthorized transfer' of space technology is a prime example of why the US and others are hesitant to partner with China.[12]

In this instance, a private company, Loral, contracted with Chinese launch services to put a commercial satellite in orbit. When the launch failed, Loral conducted an internal accident investigation to determine the causes of the failure. The results of their investigation, which allegedly identified several problems inherent with the Chinese launch vehicles, were then passed to China without authorization. This information enabled China to make major advances in both commercial and military launch capabilities. This issue and the implications it carries

with it makes many would-be partners think twice before inviting China to join potential partnership ventures. No company or country wants to put its intellectual property in a position where it might be compromised without promise of just or adequate compensation, or proliferated to third party countries.

The United States, on the other hand, is a world leader in the research and development of new technologies and is regularly at the forefront of fielding new capabilities, particularly space-related technologies. The US is always looking for partners who can help shoulder the financial and technological burdens of advanced research and technology development. Unfortunately, it has a poor track record of success with many so-called partners. At the outset, each partner is eager to begin a new adventure and happy to share in costs as well as benefits of various programs. However, as time progresses and projects fall behind and costs rise, many partners are easily discouraged and either drop out or significantly reduce the scope of their support of the project. The result is that the US is generally left holding the bag with a tough decision to continue alone or drop the project altogether.

The International Space Station (ISS) is a prime, high-visibility example of this type of behavior. When the ISS was first conceived, it was to be a joint program with many countries participating financially as well as technologically by developing hardware and software for the program. Over the long period of time from inception to construction and the longer period of time to completion, many partners have reduced their support of the program in both areas, or terminated it all together. The result is that the remaining partners have had to pick up the excess costs or limit their participation in the project. Unfortunately, the US has picked up the lion's share of the dropped support in order to complete the program, which has only further damaged

our credibility with partner nations as well as the American public. Furthermore, continued funding for the ISS has come at the expense of other space programs.

While Congress is often loathe to quit a worthwhile project, especially if it generates jobs, continuing alone impacts the entire space portfolio. The 'saved' jobs in one program may in fact be lost anyway to maintain costs, while new jobs that could have been created in new fields with new programs are not initiated due to lack of funds. The opportunity cost of these programs in terms of jobs not created is often the biggest loser in these cases.

In addition to providing funding, the US is also generally responsible for the lion's share of technology required to complete a project and it is rarely fully or fairly compensated for those contributions. Again, the ISS is a prime example of the US continuing to support a "worthwhile" project, despite other partners dropping out or significantly reducing the scope of their participation. Research and development dollars that coul have been used to further other projects had to be redirected back to the ISS to complete the development of the remaining stages, putting other missions like the Space Shuttle replacement program in jeopardy.

Given the track record of both countries (i.e. the US picking up the tab for failed partnerships, and China's poor behavior as a strategic partner) it would not seem realistic that engagement is the right strategy. However, putting the past behind us, both stand to gain substantially from a strategic partnership. The stakes are high enough that we can't afford to make the wrong decision, and no decision is the worst option.

The three areas most impacted by a China engagement strategy are economic, political and military. Each of these areas has the potential for great gains for the US as well as significant losses. The optimal scenario provides gains for each country with minimal losses on either side. With understanding and cooperation from both sides, this is an achievable goal.

ECONOMIC IMPACTS

The economic arena provides a very compelling argument in favor of cooperation. The high cost of research and development as well as constructing and launching satellites makes it extremely prohibitive to initiate a space venture alone. As costs are shared across multiple partners, the same, or nearly the same, benefit is achieved by all partners, making it much more cost effective when compared to developing technology and completing the project solo. It is thus much easier to justify and approve new projects as joint ventures.[13] China is a seemingly ideal economic partner, if only because it has very large coffers and has demonstrated a willingness to use those resources in pursuit of space-related objectives. Partnering with China on a peaceful space venture would relieve significant economic pressure on US Government budgetary constraints. There are many valuable, yet low threat, research and development projects and ideas in various stages of development that would be great candidates for a partnership with China. For example, there are many civil projects in need of funding regarding medical experiements in space, effects of space weather on near space satellites, space weather effects on cell phones, to name a few. This type of joint project could open the door to expanded partnerships with China in other areas.

Disadvantages of China as an economic partner include its inflexibility to release its currency to market forces as well as its failure to police significant intellectual property rights issues. [14] The Chinese are shrewd businesspeople, and have been very successful in recent business and other monetary ventures, as evidenced by their ever-expanding economy. This is partly because they are meticulous about accomplishing the required due diligence when engaging a project, and partly due to their ability to fund a project to completion and reap the long-term rewards it has to offer. In addition to providing greatly needed economic assistance to

US space projects, a joint venture may also provide an avenue to apply subtle political pressures to China through our foreign policy channels as well.

POLITICAL IMPACTS

A key driver in any joint venture is the political implications of the proposed collaboration. Our political relationship with China is tenuous at best, with neither side trusting the other completely, and in general discord respecting sensitive matters, such as the Taiwan issue and human rights discussions. Any joint venture between the US and China, particularly in an area as sensitive as space, may be perceived as waffling on our part which may then be construed as a moral compromise. Jeffrey Logan, a specialist in Energy Policy in the Resources, Science and Industry Division, points out in a special report to Congress that "China is widely criticized for its record on human rights and non-democratic governance. Any collaboration that improves the standing of authoritarian Chinese leaders might thus be viewed as unacceptable."[15] However, a joint venture in the name of science may help to reduce barriers and open further dialog into many areas that are currently strained. President Nixon's so-called "Ping-pong politics," or using non-contentious means to begin dialog in other areas, may be an effective way to open doors currently closed to US involvement.

Conversely, if we are unable to come to a suitable agreement over terms, or if additional accusations of piracy or claims of 'unintentional technology transfers' occur, pursuing a partnership may further exacerbate tensions between us. Logan posits that any joint venture with the Chinese may be ineffective, arguing "that increased collaboration will not produce tangible benefits for the United States, especially without a new bilateral political climate."[16] An event like this, however, could prove to be the catalyst to political advances that could result in improved and expanded political interaction. Just as the sports exchanges in the 1970's provided

opportunities for the friendly exchange of ideas, so might a joint space venture provide opportunities for extended dialog in other areas.

Another potential benefit from a partnering relationship with China is that it would allow us to 'control' the rate of their development by keeping them dependent on US technology, offsetting the need for China's unilateral development. "Collaborating with China – instead of isolating it – may keep the country dependent on U.S. technology rather than forcing it to develop technologies alone. This can give the United States leverage in other areas of the relationship."[17]

The political arena is one of the most sensitive regarding any potential partner. According to Steven Lambakis, any political decision can be significant because it can take years to reverse if it turns out not to be in our favor.[18] This may be particularly true in the case of China, since it is on a steady rise and set to overtake the US economy by 2050.[19] If and when China overtakes the US, it will be nearly impossible to reclaim the lead in any area without a significant shift in foreign and domestic policies currently affecting the US economic and political climates. Once our preeminence in space is lost, it will likely be gone for good. For this and other reasons, it may be beneficial to abandon the isolationist strategy in favor of a leading partner role with China space. In this way we can slow the development of Chinese space technology, keeping them dependent on the US and forestall their rise in space power.

MILITARY IMPACTS

A key area of competition lies with the military powers on opposite sides of the Pacific Ocean.[20] With regards to intelligence, a strong argument against partnering with the Chinese space industry is that their strategic offensive and defensive programs would likely be significantly advanced through the relationship. Since many civil and commercial space

applications can be modified to fit military missions, or so-called "dual-use" technology, it is certainly reasonable to conclude that any benefit they derived from the collaboration would be used militarily. "Uncertainty over China's pathway to potential major power status, the possibility of a conflict over Taiwan, and the inherent dual-use nature of space technologies means that China's improving space capabilities could be used against the U.S. military."[21]

Since China is potentially one of our key peer competitors in the future, it does not seem wise to give them any additional advantage by first showing our hand to them, and then aiding them in the development of their own capabilities which would then likely be used against us. [22] Any collaboration with China would have to be strictly monitored to prevent either side from sharing or gathering more information than intended. Such actions would undermine relations, rather than improve them.

At the height of the Cold War with the Soviet Union, similar joint space ventures did much to ease tensions between the two countries. A space docking procedure in 1975 provided an opportunity for US and Soviet teams to work together and demonstrate to the governments as well as the public from both countries that it was possible for 'enemies' to work together for the common good.[23] Our relationship with China is much better than ours was at that time with the Soviets, so this should certainly be a possibility.

Proliferation issues provide perhaps the strongest rationale against collaboration with China. Their historical lack of respect for intellectual property, as well as demonstrated willingness to engage in 'unintentional technology transfers' and outright piracy are strong detractors to a partnership in which cutting-edge technology would be used and/or shared. However, regarding intelligence gathering, partnering with China may give us some insight into the levels to which Chinese space has advanced and allow us to more accurately determine the

stages of their development and help us refine our strategy towards them. China has traditionally maintained a close hold an all things military, particularly with their space programs. Pursuing a partner-type relationship might help open a dialogue that would otherwise be stifled.

There are, however, areas of concern. To start, space control is a controversial issue that has been raised recently regarding the US' military stance toward any foreign space power. One prominent proponent of active military space control advocates that the US become the watchdog for space, only allowing (by threat or use of force) peaceful applications in space.[24] Ideally under this plan, as the world superpower, we would act as the 'watchdog' for space and only allow peaceful applications to reach orbit. We would enforce that edict with the real threat of shooting down launches not cleared through us, strengthening our role as global hegemon by violating the very edict we are imposing on everyone else: no weapons in space.[25]

The fallacy of this idea is that it assumes the US would actively control foreign military space activities through military means. While we currently have the capability to monitor what goes into space and speculate on its purpose, we don't possess any active space control capabilities. Any interference in our own space activities would be met with clenched fists; we can rightly assume other countries would react similarly to our forceful intrusion into their sovereign activities.

While this is a very interesting perspective and deserves a careful analysis on its own merits, for this discussion, I believe that the window of opportunity to take this route has passed. Our dominance of space is waning with the end of our manned space flight era and soon we will no longer be the dominant space leader we once were. A potential method to maintaining our space dominance is to partner with China in nonthreatening ways which will allow both our programs to continue to develop peacefully.

WAYS TO PARTNER

There are several low-threat options we could initially pursue with China that could lead to better relations and increased trust. Information sharing from previous experiences is a low-threat approach to open the door to a dialogue. "Confidence building measures (CBMs) such as information exchange on debris management, environmental and meteorological conditions, and navigation, are widely considered an effective first step in building trust in a sensitive relationship."[26]

Inviting China to participate in ongoing multi-lateral activities is another low threat opportunity to engage in partnering activities. Particularly when starting out, multi-lateral partnerships may be the most comfortable and tolerable for each country. As we grow more comfortable with each other, we can logically progress to bilateral arrangements and further cooperation. The International Space Station is an example of an ongoing project in which China could potentially participate. It has very broad exposure and support across many nations, and may be a good introduction point for China to the international space stage.

Exchanging military officers in an academic environment is another low-threat opportunity to build bridges with China. These officers, serving with foreign counterparts in academic settings, will be able to build a strong foundation for future exchanges. Dialogues including possible space 'rules of the road,' or international space policy or other potential military topics would help to bring both sides closer together. Since the Chinese space program is under the auspices of the People's Liberation Army (PLA) and the US military also has ties to the National Aeronatics and Space Administration through the astronaut program, it makes sense to use military members in a space-related personnel exchange. After building relationships of trust with their counterparts, these exchange officers will then be perfectly positioned to lead

delegations on more in-depth exchanges and open dialogues previously unavailable to either side.

SUMMARY

The US and China have both undergone significant changes in the makeup of their respective space programs. The US civil space program has peaked and is trending toward decline with the retirement of its Space Transport System (STS, or Space Shuttle program) and subsequent loss of much of its space industrial base. China, on the other hand, has recently injected a tremendous amount of vigor in the form of resources and national pride into their space program. The US must take note of the rise in Chinese space power and react in one of two ways: engage as a competitor by isolation, competition or control, or seek to partner with China in future space ventures.

There are many reasons both for and against collaboration with China in a peaceful space venture. The three main areas of potential benefit are economic, political, and military. In the economic realm, partnering with China would relieve a significant burden on the US civil space programs, potentially allowing new scientific missions in which we would not otherwise be able to participate or fund. Potential losses of technology could be mitigated through careful supervision and tight controls, while slowing the development of Chinese space technology and leveraging our own space superiority. Economically it makes sense that collaboration with China in a peaceful space venture would prove beneficial to the US.

Politics with China have been somewhat strained since the formal US recognition of the People's Republic of China instead of the Republic of China (Taiwan) in 1979. In the spirit of cooperation and openness, a joint space venture could provide the breakthrough we are looking for with regards to Chineseforeign relations. While such a relationship would be frowned upon

by some as a 'moral compromise,' it could have some long-term benefits that are worthy of further consideration. Pursuing peaceful avenues of cooperation may open doors previously unavailable to US politicians and bring about a new era in US-Chinese foreign relations similar to Nixon's Ping-Pong Politics of the 1970's. A bilateral space venture may yield great benefits in all three areas of consideration, as well as provide insight into Chinese operations and allow us to assess their current abilities and future ambitions.

Military cooperation, while at first glance a distasteful option, may actually offer a unique opportunity with the Chinese. Yes, their historical lack of regard for intellectual property rights and outright piracy are a significant threat with this option (and others), but it may be worth the cost. Collaboration in military space ventures may provide the trust necessary to lead to expanded collaboration in other government areas, further improving US-China relations. It may be the opportunity we are looking for to open the door to China that has long been closed to outsiders. For these reasons, it may be wise to approach collaboration with the Chinese in the relatively harmless venue of civil space, looking forward to the potentially rewarding benefits of further insight and a closer relationship. Such a relationship with China will be beneficial to both parties in the long and short term.

CONCLUSION

Although there are many good reasons to compete with China rather than partner with them in a peaceful space venture, I believe it would be detrimental to our national security to do so. The US stands to gain a significant amount of financial assistance, potentially allowing our struggling civil space programs to continue to grow. In addition, China would benefit through the agreement by improving its international status as a world power. Moreover, opening a

dialog with the intent of partnering with China in a peaceful space venture could be politically in our best interest and open many doors currently closed to us.

When viewed from a strictly military perspective, though, we could potentially lose more in 'unauthorized transfers' of technology and information than we would stand to gain economically and politically. Our loss, or rather, their gain, in the form of advancing their space technical expertise, would be one from which we would be very hard pressed to overcome. As things currently stand, China is making gains on every aspect of its space program, and will quickly catch up and potentially surpass us unless we make some institutional changes that redirect our interests, efforts and resources back toward researching and developing the next generation of space technology. However, we have sat idly for too long and have let our space industrial base and research and development capabilities wane nearly to the point of non-existence. Due to our need for an injection of motivation as well as capital, for now and into the foreseeable future, partnership is the answer with China and space.

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