Global Innovation and Strategy Center

Chinese Counterspace Intentions

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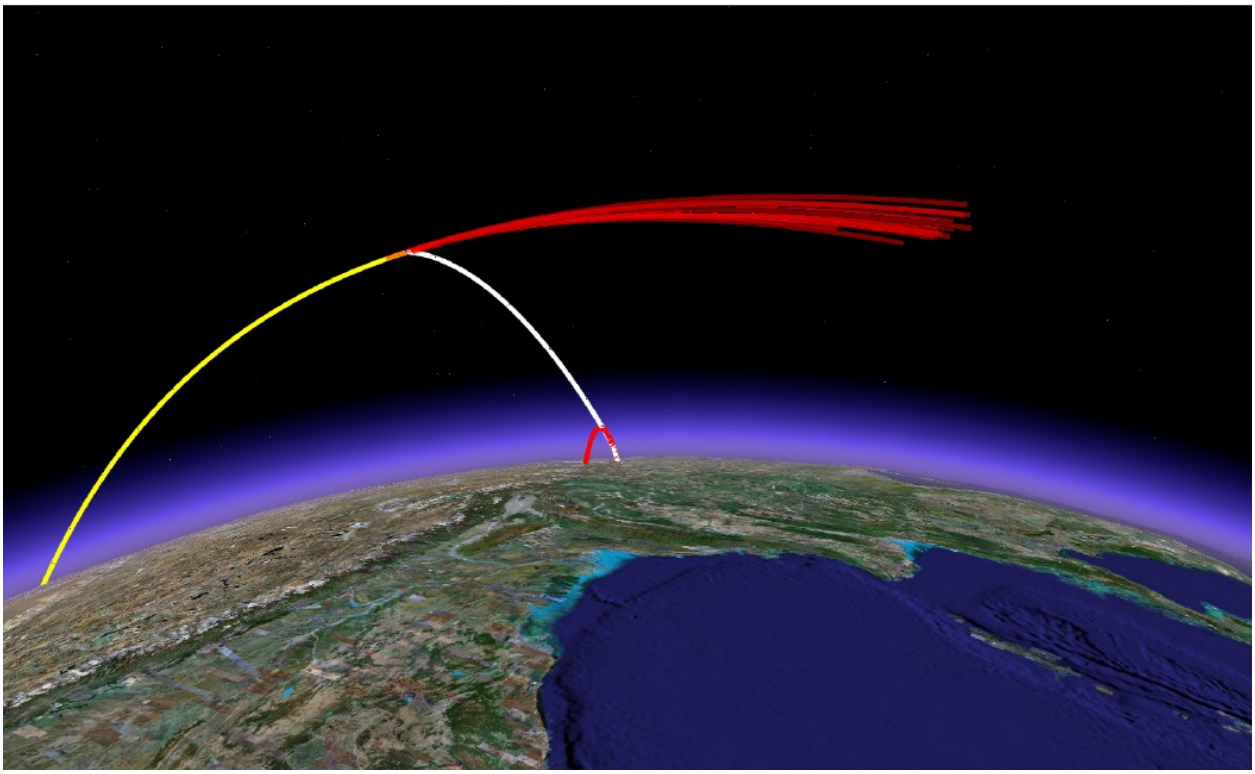

Intern Researchers:

Michael Caldararo
Jason Cantone
Jonathan Cowin
Rachel Huggins
Hailey Rademacher
Drew Sendelbach

Project Management and Oversight:

John G. Hudson II, Ph.D.
Sarah Mussoni, MEd
Kristen Rodgers

Approved: Kevin E. Williams, SES, DAF
Director, Global Innovation and Strategy Center

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Michael Caldararo
Jason Cantone
Jonathan Cowin
Rachel Huggins
Hailey Rademacher
Drew Sendelbach

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This report details Chinese perceptions about space warfare and U.S. space policy. While China lacks a published space policy outlining the guiding principles of the Chinese space program, Chinese scholars and leaders make their opinions about space warfare very public. Reports of China's burgeoning space weapons capabilities, as well as traditional Chinese military doctrine, conflict with the efforts of Chinese leaders to articulate a peaceful Chinese approach to outer space. Alternatively, the Chinese perceive the United States space policies to be unilateral and aggressive. Many Chinese leaders have concluded that the U.S. seeks to dominate space. The Chinese see themselves not as a rising power, but as a country returning to a rich cultural history of power and prestige. This strong sense of nationalism and culturalism impacts Chinese decision-making. It is also essential to understand the importance of long-term relationships and trust-building within the Chinese people, as the style of Western negotiation common in the U.S. could backfire and prevent cooperation.

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ACRONYMS

ABM	Anti-Ballistic Missile
AEC	Atomic Energy Cooperation
AEW	Airborne Early Warning
AIT	American Institute in Taiwan
ASAT	Anti-Satellite
BMD	Ballistic Missile Defense
BSA	Brazilian Space Agency
CBERS	China-Brazil Earth Resource Satellite
CCP	Chinese Communist Party
DOC	Department of Commerce
DoD	Department of Defense
DOE	Department of Energy
DoS	Department of State
DSP	Defense Support Program
ELDO	European Launcher Development Organization
ESA	European Space Agency
EU	European Union
FDI	Foreign Direct Investment
FY	Fiscal Year
GDP	Gross Domestic Product
GLONASS	Global Orbiting Navigation Satellite System
GPS	Global Positioning System

ICBM	Intercontinental Ballistic Missile
IMF	International Monetary Fund
INTELSAT	International Telecommunications Satellite Organization
ISAS	Institute for Space and Astrological Science
ISRO	Indian Space Research Organization
ISS	International Space Station
ITAR	International Traffic and Arms Regulations
JAXA	Japanese Aerospace Exploration Agency
JEM	Japanese Export Module
JFCC	Joint Functional Component Command
LEO	Lower Earth Orbit
MKV	Multiple Kill Vehicle
MTCR	Missile Technology Control Regime
NASA	National Aeronautics and Space Administration
NADSA	National Space Development Agency
NATO	North Atlantic Treaty Organization
NTM	National Technical Means
ORS	Operationally Responsive Space
OST	Outer Space Treaty
PAROS	Prevention of an Arms Race in Outer Space
PLA	People's Liberation Army
PRC	People's Republic of China
SATCOM	Satellite Communications
TBM	Tactical Ballistic Missile
UN	United Nations

UNOOSA	United Nations Office for Outer Space Affairs
USML	United States Munitions List
USSTRATCOM	United States Strategic Command
USTRANSCOM	United States Transportation Command
VEU	Validated End-User

PREFACE

This report is the product of the United States Strategic Command (USSTRATCOM) Global Innovation and Strategy Center (GISC) internship program. A team of graduate and undergraduate students at the University of Nebraska-Lincoln, University of Nebraska-Omaha, and Creighton University worked together to provide this multidisciplinary, unclassified briefing.

The Fall 2008 team was charged with reviewing recent Chinese writings from the military and academia in order to obtain more information about Chinese plans or intentions for its space and counterspace capabilities.

This project took place between mid-September and December of 2008, with each team member working twelve to twenty hours per week. While the GISC provided the resources and technology for the project, development of the project design, conducting research and analysis and providing recommendations were all left solely up to the team.

EXECUTIVE SUMMARY

The Chinese Counter Space Intentions team was tasked to address two questions:

1. "What are current Chinese scholars and leaders saying about space warfare?"
2. "How do the Chinese perceive United States policies regarding space?"

The Space Team sought to address three additional questions:

1. What are the implications of the current space and economic policy on United States national security?
2. How do internal, cultural motivations impact China's space and counterspace intentions?
3. What can the United States do to encourage the development of Chinese plans and policy that is in the best interest of United States national security and international stability?

The team was allotted three months to research, write, and brief the client. Numerous academics and policy experts were used to inform and direct the examination of these questions, leading to a series of policy recommendations addressing each question.

China lacks a published space policy outlining the guiding principles of the Chinese space program, but Chinese scholars and leaders make their opinions about space warfare very public. Reports of China's burgeoning space weapons capabilities, as well as traditional Chinese military doctrine, conflict with the efforts of Chinese leaders to articulate a peaceful Chinese approach to outer space. For these reasons, American defense experts must be wary of the differences between vocal Chinese calls for peace and their growing offensive capabilities. In addition, U.S. officials must realize that many Chinese leaders perceive the U.S. space policies to

be unilateral and aggressive in an attempt to dominate space. To mitigate the negative international perceptions and interpretations of United States policies, the language of the 2006 National Space Policy could be softened and increased attention could be given to international dialogue and explanation.

Understanding these perceptions is essential to protecting U.S. national security. Aggressive policies will spawn aggressive counter-policies, sending the globe into a space arms race. Multiple plausible scenarios for a war (or accident) in space ensue, the consequences of which are significant and far-reaching. The consequences of a space race, however, are not solely those involving national security. It is also important to understand trade regulations, such as ITAR, which might not only hurt the international perception of the U.S., but also detrimentally impact the U.S. commercial space industry. Thus, it is important to re-examine not only the U.S. space policies, but also economic regulations.

This reexamination of policy must also take into account cultural differences between the U.S. and China. The Chinese see themselves not as a rising power, but a country returning to a rich cultural history of power and prestige. Nationalism is incredibly important and long-term relationships and trust building must be at the core of any bilateral venture. A better understanding of Chinese culture and interpersonal relationships will help maintain open lines of communication and cooperation to prevent a space arms race. In this manner, considering China as a new member of the International Space Station (ISS) would encourage collaboration on joint ventures that would direct their space policy outwards instead of focusing solely on internal Chinese ventures. In addition, a U.S. reaffirmation of the Outer Space Treaty will show the

world that we understand space is a multifaceted, multidimensional atmosphere that cannot be dominated solely by the U.S.

INTRODUCTION

The use and exploitation of outer space is quickly creating a global military concern while at the same time revolutionizing the global economic market, which opens up new avenues for economic growth, communication, and military applications. Satellite networks create the opportunity to share information and coordinate operations in a manner of efficiency never before imagined. For the United States (U.S.) in particular, satellite capabilities have revolutionized the use of conventional military forces and intelligence gathering operations. While the United States is still the most dominant country in the world with regards to space technology, other countries are rapidly purchasing or developing space technology that may soon pose a serious threat to U.S. dominance.

In particular, the U.S. must be mindful of China's emerging space program. Recent cultural and nationalistic motivations have inspired a surge of innovation and advancement in China's space capabilities. Simultaneously, China's observation of the U.S. application of satellite technology with respect to the coordination of the Gulf War and the "War on Terror" in Afghanistan and Iraq provided incontrovertible evidence of the advantages gained through the use of space technologies.[1] As a result, Chinese officials have acknowledged their inability to confront the U.S. in conventional battle should the need arise.[2] Instead, the Chinese military, the People's Liberation Army (PLA), has begun to focus on developing asymmetric tactics capable of targeting key U.S. space installations.[3] In the event of an armed conflict with China or any other

[1] Wortzel, Larry M. "The Chinese People's Liberation Army and Space Warfare." 2007. American Enterprise Institute for Public Policy Research. 29 September 2008. p 1-20. http://www.aei.org/publications/pubid.26977/pub_detail.asp.
[2] Wortzel, Larry M.
[3] Wortzel, Larry M.

country, the loss of these space assets would greatly hinder the effectiveness with which the U.S. military operates.

China, on the other hand, is occasionally considered to be "like a dragon that, waking up after centuries of slumber, suddenly realizes many nations have been trampling on its tail."[4] However, China's actions as a waking dragon have been perceived very differently by opposing states. Through official white papers and speeches to prestigious international delegations, such as the United Nations, Chinese leaders and scholars consistently declare that China will rise peacefully, focusing upon improvements in trade relations and a ban on space weaponization. Despite these words, actions such as the January 2007 testing of a direct-ascent anti-satellite weapon (ASAT) led U.S. leaders to ponder whether the ASAT test was meant to show how the U.S.' greatest logistical advantage, its reliance upon space-based assets, could become a liability. Others argue that it was a show of power intended not to cause fear in other countries, but rather to gain international prestige. Finally, it is possible that it was a poorly planned attempt by Chinese leadership to focus international attention on the need for a comprehensive ban on weapons in space.[5]

Regardless of the intent of the Chinese ASAT test, concern is certainly justified with regards to China's ability to deprive the U.S. of its space assets. A prime example of the crippling effect of the loss of satellite capability can be seen in an examination of the failure of Galaxy IV in May 1998. A minor technical malfunction forced the satellite to rotate out of the correct position which prevented it from relaying information back to Earth. This single satellite carried 80-90

[4] Mahbubani, Kishore. "Understanding China." Foreign Affairs. September/October 2005. Council on Foreign Relations. 8 October 2008. http://www.foreignaffairs.org/20050901faessay84505/kishore-mahbubani/understanding-china.html.
[5] Bates, Gill, and Martin Kleiber. "China's Space Odyssey: What the Antisatellite Test Reveals About Decision-Making in Beijing." May-June 2007. Foreign Affairs 15 October 2008. http://www.foreignaffairs.org/20070501facomments86301/bates-gill-martin-kleiber/china-s-space-odyssey-what-the-antisatellite-test-reveals-about-decision-making-in-beijing.html.

percent of the signals for the country's then 45-million pagers as well as radio broadcast signals.[6] While the failure inevitably created a massive inconvenience for the millions of individuals reliant upon their beepers and the radio channels that were temporarily off-air, the malfunction did not pose a serious threat to national security.

The Chinese, in comparison, have demonstrated the ability to destroy orbiting satellites. Should the unfortunate circumstance arise when the U.S. and China are in conflict, satellites conducting military operations would be the most logical target for an offensive or preemptive strike. With consideration to the massive amount of information that was transmitted by the Galaxy IV satellite alone, the intentional and concentrated destruction of military satellites would deal a paralyzing blow to its ability to effectively maintain offensive, defensive, and communications capabilities.

It is imperative to ask then how the U.S. can gain additional insight into China's beliefs and aspirations about space technology. The U.S. must often base policy on perceptions of China's space intentions inferred from past actions, as China conceals many of its plans and keeps its true intent "largely unknown."[7] As a result, the U.S. policy toward China often remains reactionary and focused upon immediate events such as the ASAT test rather than geared toward a long term plan of action.[8] While it is essential to examine Chinese and U.S. space policies, another answer might come from a deeper understanding of Chinese culture. A successful space program might bring China the prestige it desires. It is also important to examine U.S.-China relations, as incidents such as the 1999 missile attack on the Chinese embassy in Belgrade impact

[6] Rogers, Adam. "The Day the Beepers Died." Newsweek 01 Jan. 2008.
[7] Dixon, Troy L. "More Dreams in Longer Night: United States China Policy." 2006. U.S. Army War College Strategic Research Project. 27 October 2008. http://www.strategicstudiesinstitute.army.mil/pdffiles/ksil329.pdf.
[8] Segal, George. "East Asia and the 'Constrainment' of China." 1996. International Security. 20.4. 24 September 2008. http://www.mtholyoke.edu/acad/intrel/chisegal.htm.

international perceptions. [9] Many Chinese still believe that the Belgrade attack came with the message "beware of United States power."[10] However, space is not just a concern for the U.S. and China; international space powers such as the countries in the European Space Agency (ESA), Russia, India, Japan, and Brazil must also be considered, especially if an international goal is to create collaborative space ventures and agreements. Treaties such as the Outer Space Treaty (OST) and the Prevention of an Arms Race in Outer Space (PAROS) treaty understandably carry less power if major space programs such as the U.S. are not signatories.

The U.S. no longer holds a near monopoly in space. Accordingly, any recommendations on how the U.S. can best serve its national interests must consider emerging space powers as well. For instance, during the creation of this report, China promoted its first space walk, India's first unmanned space probe orbited the moon, and the ESA unveiled an ambitious security and defense space initiative in a €10.5 billion funding request to The Hague. Space is an increasingly multi-polar world and the U.S. must consider not only the best option for its national security and economic interests, but also the best strategy to prevent a space arms race and increase international cooperation.

Definitions

In order to provide a baseline for reviewing recent Chinese writings from the military and academia to obtain more information about Chinese plans or intentions for its space and counterspace capabilities, it is necessary to provide standard definitions upon which further discussion is based.

[9] Mahbubani, Kishore. "Understanding China." Foreign Affairs. September/October 2005. Council on Foreign Relations. 8 October 2008. http://www.foreignaffairs.org/20050901faessay84505/kishore-mahbubani/understanding-china.html.
[10] Mahbubani, Kishore.

- **Counterspace**: actions that "involve lethal or non-lethal means to neutralize an adversary's space systems or the information they provide." According to Tom Wilson, Space Commission staff member, counterspace operations can be either offensive or defensive, and are designed to achieve five main purposes: deceive, degrade, disrupt, deny, or destroy an adversary's space assets or information.[11]

- **Space Warfare**: the use of force involving space, which includes attacks that originate in space and targets space objects, strikes against targets in space from ground bases, or conducting surface or air attacks from space.[12]

- **Space Militarization**: the use of space systems and capabilities to enable and enhance land, air, and sea based operations and warfare.[13]

- **Space Weaponization**: the deployment of offensive and defensive weapons into space, including capabilities that can deceive, degrade, disrupt, deny, or destroy space assets, or protect space assets from being attacked in the same way.[14]

Objectives and Methodology

This research paper will address five main objectives and their related issues.

- How do the Chinese perceive U.S. policies regarding space?
- What are current Chinese scholars and military leaders saying about space warfare?

[11] Wilson, Tom. "Threats to United States Space Capabilities." 2005. Commission to Assess United States National Security Space Management and Organization. 30 September 2008. http://www.fas.org/spp/eprint/article05.html.
[12] Wortzel, Larry M. "The Chinese People's Liberation Army and Space Warfare." 2007. American Enterprise Institute for Public Policy Research. 29 September 2008. p 2. <http://www.aei.org/publications/pubid.26977/pub_detail.asp>.
[13] "Space Support to Army Operations FM 3-14." 2005. Department of the Army. 2 November 2008. Foreward. http://www.fas.org/irp/doddir/army/fm3-14.pdf.
[14] "Space Operations: Air Force Doctrine Document 2-2." 2006. Joint Doctrine for Space Operations in Joint Publication 3-14. 2 October 2008. p 2. http://www.fas.org/irp/doddir/usaf/afdd2_2.pdf.

- What are the implications of current U.S. economic and space policy on U.S. national security?
- How do internal cultural motivations and external events impact China's space and counterspace intentions?
- What can the U.S. do to encourage development of Chinese space plans and actions that are in the best interest of U.S. economic well-being, national security, and international stability?

The strength of the U.S. civilian, economic, and military sectors are rooted in space. Understanding Chinese space and counterspace intentions is crucial to the development of U.S. military strategy and national security. Furthermore, because of the intricate economic relationship between China and the U.S., it is important to ensure that decisions regarding the use of space are made carefully. Therefore, due to the complex nature of the use of space, this report has incorporated expert opinions and research to analyze a variety of issues that affect the use of space, national security, economic well-being, and international stability.

This research considers congressional acts, domestic policy, lessons from Chinese culture, past bilateral U.S.-Chinese cooperation, the nuclear arms race, trade regulations, international law, and other applicable realms to comprehend Chinese space intentions. This is not a bilateral issue between the U.S. and China. Instead, the team approaches the paper from a multi-polar mentality, where all relevant space powers must be considered. From this analysis, the research offers recommendations for potential courses of action that the U.S. can take in the best interest of its national security and economy.

IMPLICATIONS OF STATUS QUO POLICIES

Space Militarization and Space Weaponization

To better understand the potential implications of current policy, differentiating space militarization from space weaponization is of great importance. Though these terms were previously defined (page 5), further discussion should yield sharper clarity and depth on the topic. Militarization of space refers to the use of space systems to support military operations.[15] Weaponization of space, in contrast, usually refers to the deployment of offensive weapons in space for use against space or Earth targets.[16] As of now, "no country deploys destructive weapons in space, for use against space or Earth targets, and no country possesses ground-based weapons designed explicitly to damage objects in space."[17]

While the aforementioned definitions are generally accepted, precise definitions are not established and recognized by all space-faring powers. "The absence of a singular, commonly accepted definition clearly suggests that space weaponization exists along a continuum."[18] Though space has not yet been explicitly weaponized, it is not a true sanctuary either.[19] Military capabilities categorized as conventional weapons have the potential to be offensive agents of space weaponization if used as such. Recent developments such as Lockheed Martin's Multiple Kill Vehicle (MKV) test, which can disrupt enemy ballistic missiles from space, pushes the concepts of *militarization* even further, resulting in the problem of dual-use technology . "Too

[15] Clary, Christopher and Michael Krepon. "Space Assurance or Space Dominance? The Case Against Weaponizing Space." 2003. The Henry L. Stimson Center. 26 October 2008. p. 22. http://www.stimson.org/pub.cfm?ID=81.
[16] O'Hanlon, Michael E. Neither Star Wars nor Sanctuary: Constraining the Military Uses of Space. New York: Brookings Institution, 2004. p.8.
[17] O'Hanlon, Michael E.
[18] Clary, Christopher and Michael Krepon. p.30.
[19] O'Hanlon, Michael E.

many non-ASAT technologies have potential applications as ASATs."[20] For example, intercontinental ballistic missiles (ICBM) equipped with nuclear warheads in the low-Earth orbit (LEO) functions as a latent ASAT capability if exploded in space.[21] Current arms control agreements do not address the dual use of such capabilities beyond prohibiting the use of nuclear weapons in space. Consequently, events like the January 2007 ASAT test by China are often met with nothing more than a verbal condemnation of irresponsibility.

Potential Consequences

Outer space looms as both an opportunity and vulnerability for a state's national interests. One of the most important facets about space, which often lurks unsaid in the background, is that space has no borders and it is international territory. Many domestic policies and plans for space do not fit with the interests of protecting this open access area. U.S. space policy has made a sovereign claim to the use of outer space and developed weapons to defend that title – contentions that do not mesh well with the norms established by the international community.

The Pentagon has been moving forward with plans to develop defensive and offensive capabilities. "The Bush Administration's Nuclear Posture Review suggests that the development of space-based and space-enabled systems—global strike, missile defense and enhanced command, control, and intelligence capabilities—will revolutionize deterrence."[22] However, if a nuclear arms race were to arise, increased vulnerability would become expected and commonplace.[23] Due to its significant reliance on space capabilities, the U.S. is concerned about

[20] O'Hanlon, Michael E. Neither Star Wars nor Sanctuary: Constraining the Military Uses of Space. New York: Brookings Institution, 2004. p.23.
[21] O'Hanlon, Michael E. p.8.
[22] Lewis, Jeffrey. "What if Space were Weaponized? Possible Consequences for Crisis Scenarios" 2004. *Center for Defense Information.* 16 November 2008. p.12. http://www.cdi.org/PDFs/scenarios.pdf.
[23] Lewis. Jeffrey. p.11.

threats from rising space faring countries, such as China. Evaluating China's development in space warfare capabilities, however, shows that Chinese movements are similarly stimulated by preemptive space positions of the U.S., the perceived lack of cooperation, and internal national aspirations. It appears then, that, causality is circular in nature, potentially hindering effective diplomatic progress between the two countries.

U.S. actions that develop, use, or threaten the use of space warfare technology will likely have negative ramifications on both international stability and U.S. national security. Potential risks lie in the weaponization of space, creating more risks to national security. "Space weapons merely exacerbate underlying instabilities," and may blind policy leaders into believing that they are necessary to avoid vulnerability.[24] On the other hand, space capabilities could just create new vulnerabilities. Below are five possible crisis scenarios, developed by Jeffrey Lewis of the Center for Defense Information, which could result from the weaponization of space.

Scenario One

When one nation develops space warfare capabilities, other nations will rationally do the same. It would be irresponsible, and unlikely, for China or other major powers to not seek to develop similar space warfare capabilities as a deterrent against other states.[25] Acquisition of space defense capabilities by the largest space powers will most likely spread to other space faring countries, such as India and Brazil, who will want to be equally competitive and powerful in space.

[24] Lewis, Jeffrey. "What if Space were Weaponized? Possible Consequences for Crisis Scenarios" 2004. *Center for Defense Information.* 16 November 2008. p.12. http://www.cdi.org/PDFs/scenarios.pdf.
[25] Lewis, Jeffrey. p.13.

Non-space faring states who seek access and skill in space will also pursue these capabilities because such capabilities are especially empowering for smaller states with smaller forces. It is important to remember that there are no non-proliferation treaties regarding the proliferation of space weapons, especially high technology assets such as lasers and particle beams. Rogue states and terrorists have a much larger chance of acquiring space assets either through open-market purchases, espionage, or the black market.

It is important to not disregard countries that do not pursue space programs. North Korea, Iran or "any nation-state with a basic nuclear weapon and an intermediate range ballistic missile could effect what is known as a high altitude nuclear detonation in Lower Earth Orbit, where military and commercial imaging satellites are located…an intercontinental ballistic missile can reach Geostationary Earth Orbit which is where critical United States military and commercial communication satellites are."[26]

Scenario Two

Space warfare could result from a U.S. preemptive strike against China, guided by fear and miscalculations. As predicted by a Naval War College war game, instability in the relationship between the governments of China and the U.S. regarding Taiwan could quickly escalate to space attacks.[27] First, the U.S. assumes that the People's Liberation Army (PLA) seeks to weaken valuable U.S. space assets to deter interference with Taiwan. Gaps in U.S. intelligence and lack of space dialogue are dangerous to U.S. calculations of China's actions. The U.S. is fearful that China may render its reconnaissance, communication, and global positioning system (GPS) satellites useless to weaken its regional military operations. It may misinterpret any

[26] Lewis, Jeffrey. "What if Space were Weaponized? Possible Consequences for Crisis Scenarios" 2004. *Center for Defense Information.* 16 November 2008. p.15. http://www.cdi.org/PDFs/scenarios.pdf.
[27] Lewis, Jeffrey. p.20.

Chinese military exercises as a precursor to an attack. Then, fearful of a Chinese strike, the U.S. may preemptively attack China as a "defensive" move to protect its own satellites.[28] Chinese leaders would most likely see the U.S. attack as an act of war, and would retaliate. Aside from the economic and military consequences to assets in space, such a war would have severe ramifications for global stability.

What is most interesting about this scenario is that China need not actually have space weapons for it to occur. Because China does have ASAT capabilities, without dialogue with China, the incentives for the U.S. to act preemptively are greater.[29]

Scenario Three

Without cooperation, the development and presence of U.S. counterspace technology may create incentives for other states or potential adversaries to behave in dangerous ways. Both China and Russia have demonstrated a hyper awareness of actions the U.S. takes in space, particularly its open commitment to attain an Operationally Responsive Space (ORS). Because counterspace capabilities pose a threat to all states' assets in space, the development of such technology may alter the international relationships among the key nuclear states: the U.S., Russia, and China.[30]

"Space weapons, by threatening the nuclear forces of both countries, could well create incentives for Russia and China to do the opposite [than never use nuclear weapons]."[31] This is because the deployment of weapons in space threatens other states' nuclear weapons and then would likely reduce a state's restraint over its forces. International forces on alert, fueled by nationalism, are much more likely to make mistakes and misperceive U.S. counterspace movements. The

[28] Lewis, Jeffrey. "What if Space were Weaponized? Possible Consequences for Crisis Scenarios" 2004. *Center for Defense Information*. 16 November 2008. p.19. http://www.cdi.org/PDFs/scenarios.pdf.
[29] Lewis, Jeffrey. p.20.
[30] Lewis, Jeffrey. p.24.
[31] Lewis, Jeffrey. p.24.

likelihood of other states' misperception and error in space significantly degrades U.S. national security because it increases the likelihood that the countries may attack the U.S.[32] Therefore, space weaponization ultimately makes the U.S. more vulnerable in space and in other military theaters as well.

Scenario Four

"No state has the ability to definitely determine the cause of a satellite's failure."[33] Although satellite malfunctions or collisions with debris may only be accidents, during time of international tension these incidents may be catalysts for further conflict. This is because states may be fearful that an "accident" from space debris may actually mark the beginning of a space attack. Following these events, a state's lack of confidence feeds its growing panic and escalation follows. Therefore, confidence during such failures can often be the difference between war and peace. Introducing technology to the space theater, such as anti-satellite capabilities, further erodes a state's confidence and makes it more likely to attack other countries in space.

Scenario Five

This scenario examines the likelihood of third party escalation to space warfare. Even if the U.S. was not involved in space conflicts, increased space weaponization is likely to spread counterspace technology to more states, such as India and Pakistan. A unique characteristic of the space theater is that conflicts between other countries affect all theater occupants, not just those engaged in conflict. Given India's growing dependence on space, it is likely that it will

[32] Lewis, Jeffrey. "What if Space were Weaponized? Possible Consequences for Crisis Scenarios" 2004. *Center for Defense Information.* 16 November 2008. p.24. http://www.cdi.org/PDFs/scenarios.pdf.
[33] Lewis, Jeffrey. p.26.

acquire ASAT capabilities if other states pursue them first.[34] Pakistan has consistently demonstrated its commitment to match India's military pursuits, and has signed cooperative space technology agreements with China.

Given the violent history between the two countries, Pakistan would most likely manipulate its newly acquired space technology to potentially deny India access to space. War games demonstrate that a conflict between India and Pakistan, fuelled by ASAT capabilities, would quickly escalate to the use of nuclear weapons.[35]

Many Indian satellites are actually owned by the U.S. Since the U.S. has made an official declaration that it regards attacks of its space assets as acts of war, U.S. involvement in Indian space programs could escalate a conflict further.[36] The amount of debris that would result from space attacks would be harmful to all states with objects in space due to the lack of control over space debris. Space weapons could clearly influence international and regional stability, and will likely damage existing space capabilities of all nations.

Operationally Responsive Space

The ratification of the John Warner National Defense Act for Fiscal Year 2007 (H.R. 5122) authorized funding for U.S. domestic and international defense interests, encompassing projects such as space security.[37] Tension in international political relations necessitated the security of U.S. space capabilities in order to ensure its national security interests as expressed in the U.S. National Space Policy. Procuring protection of space assets for national security purposes

[34] Lewis, Jeffrey. "What if Space were Weaponized? Possible Consequences for Crisis Scenarios" 2004. *Center for Defense Information*. 16 November 2008. p.29. http://www.cdi.org/PDFs/scenarios.pdf.
[35] Lewis, Jeffrey. p.30.
[36] Lewis, Jeffrey. p.31.
[37] United States. U.S.President George W. Bush's Statement on H.R. 5122, the "John Warner National Defense Authorization Act for Fiscal Year 2007." 2007. *Office of the Press Secretary*. 20 September 2008. http://www.whitehouse.gov/news/releases/2006/10/20061017-9.html.

requires that the U.S. space program is both situationally aware and has the capacity for immediate adaptation to potential threats. Therefore, within one hundred and twenty days of enactment of H.R. 5122, Congress mandated that the DoD establish an eight element plan for acquiring and developing space capabilities, outlining topics such as a chain of command and specific acquisition and development missions.[38] In an effort to fortify national security interests in space, the DoD Executive Agent for Space, Ronald M. Sega and former USSTRATCOM Commander General James E. Cartwright engaged key stakeholders (civil, defense, and intelligence) in the National Security Space community to set forth what is entitled a *Plan for Operationally Responsive Space* (ORS).

The DoD has generally defined ORS as "assured space power focused on timely satisfaction of Joint Force Commanders' needs."[39] The National Security Space Enterprise and assured space power depends on timely and affordable acquisition, development, and employment of space capabilities by the U.S.[40] to support military users and operations, as well as diplomatic, economic, and information needs.[41] The ORS functions from broader, more efficient space development and methods that are made possible through integration.[42] "The successful integration of space-based capabilities into the core of U.S. national security operations has resulted in an increased reliance on and demand for those capabilities."[43]

General Cartwright expressed three desires for the *Plan for Operationally Responsive Space*. He hoped that an ORS would:

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[38] United States. U.S.President George W. Bush's Statement on H.R. 5122.
[39] United States. Plan for Operationally Responsive Space: A Report to Congressional Defense Committees. 17 Apr. 2007. *Department of Defense: National Security Space Office*. 13 Oct. 2008. p.2. http://www.acq.osd.mil/nsso/ors/plan%20for%20operationally%20responsive%20space%20%20a%20report%20to%20congressional%20defense%20committees%20-%20april%2017%202007.pdf.
[40] United States. Plan for Operationally Responsive Space. Forward.
[41] United States. Plan for Operationally Responsive Space. p.1.
[42] United States. Plan for Operationally Responsive Space. p.2.
[43] United States. Plan for Operationally Responsive Space. p.3.

- Rapidly exploit and infuse space technological or operational innovations.
- Rapidly adapt or augment existing space capabilities when needed to expand operational capabilities.
- Rapidly reconstitute or replenish critical space capabilities to preserve operational capabilities.

The Plan for an Operationally Responsive Space emphasizes the strategic importance of efficient space systems for U.S. military and economic purposes. It suggests that the U.S. intends to be fully prepared for the possibility of space warfare, and will fully maximize space systems to serve domestic interests. When analyzing the Chinese governments' views about space, especially in light of The Plan for an Operationally Responsive Space, it is important to understand the many influences that determine China's relationships and technology in space. In addition, it is essential to consider the impact of Congressional acts on U.S.-China trade.

China's Economic Performance

Chinese leaders seek to transition the Chinese economy from the command economy of the Maoist era toward a market-based economy of the twentieth century, although it has not reached this status yet. Both historically and in the current economic climate, the Chinese labor force lends itself well to an agrarian society. In preparation for the 2008 Beijing Olympics, Xinhua, the Chinese news agency affiliated with the Chinese Communist Party, released detailed information regarding the current economic state of China. The Gross Domestic Product (GDP) totaled 13.0619 trillion yuan (USD $1.9062 trillion) for the first six months of 2008, a 10.4 percent

increase from the first six months of 2007.[44] In addition, more than 230 countries and regions trade with China. Foreign trade amounted to USD $1.2342 trillion in the first six months of 2008, up 25.7 percent from the first six months of 2007.[45]

Following globalization trends, the economy of China is now dependent on several other states to assist in building and maintaining its wealth. Chinese investment companies are rapidly buying up stock in U.S. banks, increasing Chinese dependence on the U.S. economy.[46] In 2008, China became the largest holder of U.S. debt. In fact, "China's new status -- it now owns nearly $1 out of every $10 in U.S. public debt -- means Washington will be increasingly forced to rely on Beijing as it seeks to raise money to cover the cost of a USD $700 billion bailout."[47] In March 2009, the China trade surplus jumped to USD $18.56 billion, a 41.2 percent increase since March 2008.[48] The global financial crisis has not skipped China and foreign demand for Chinese goods.[49] Still, China continues to subsidize its production, entrench the government in the private industry, and manipulate currency to sustain a bolstered trade surplus with the U.S., all practices in staunch violation of World Trade Organization (WTO) standards.[50] Furthermore, despite recent outcries regarding the safety regulations for Chinese products and human rights violations, China's manufacturing center remains on course to continually increase production.

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[44] Xinhua News Agency. "Factbox: Facts about China 's economy." Accessed at http://news.xinhuanet.com/english/2008-08/06/content_8993906.htm (August 2008).
[45] Xinhua News Agency.
[46] Oliver, Chris and Steve Goldstein, "China to Allow Investment into US Stocks, Funds," *The Wall Street Journal*, April 27, 2008.
[47] Faiola, Anthony and Zachary A. Goldfarb. "China Tops Japan in U.S. Debt Holdings." 19 November 2008 The Washington Post. 22 November 2008.://www.washingtonpost.com/wpdyn/content/article/2008/11/18/AR2008111803558.html.
[48] BusinessDay. "China's trade surplus jumps in March." 10 April 2009. http://news.theage.com.au/breaking-news-business/chinas-trade-surplus-jumps-in-march-20090410-a2r0.html
[49] BusinessDay.
[50] Barnett, Steven, Nicholas Blancher , Ray Brooks, Annalisa Fedelino, Tarhan Feyzlogu, Thomas Rumbaugh, Raju Jan Singh, Tao Wang. "China's Growth and Integration into the World Economy: Prospects and Challenges." *The International Monetary Fund: Occasional Paper 232.* Washington, DC, 2004.

Comparatively, the growth of the Chinese economy is actually *outpacing* the U.S.[51] China has consistently yielded a much higher GDP percentage increase than the U.S. and is likely continue to do so into the foreseeable future.[52] This is due, in part, to a larger untapped labor force of China, as well as burgeoning industrial and manufacturing centers. The mobilization of China's labor force from rural to urban dwellings caused a massive consumption increase for natural gas and oil.[53]

The fact the Chinese economy is in a period of flux will provide challenges in the near future that must be overcome.[54] Specifically, it is likely China will artificially regulate prices for a brief period in order to avoid external shocks to the economy.[55] In addition, in China the exchange rate is fixed, so the government can directly change the rate as a buffer from economic downturn.[56] Most importantly, and in part due to the Chinese credit crunch of late 2007, China will likely institute some manner of banking reform if it is to survive.[57] The recent economic crisis worldwide only supercharges this notion of banking reform. Analyses regarding the international and domestic state of China's economy should consider not only banking stability, but also be cognizant of the fact that there is no well-established bond market in China.[58]

Considerations of Chinese monetary tendencies show that leaders will act and have acted often to the detriment or neglect of economic considerations. For instance, China is willing to spend an

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[51] Barnett, Steven, Nicholas Blancher , Ray Brooks, Annalisa Fedelino, Tarhan Feyzlogu, Thomas Rumbaugh, Raju Jan Singh, Tao Wang. "China's Growth and Integration into the World Economy: Prospects and Challenges." *The International Monetary Fund: Occasional Paper 232*. Washington, DC, 2004.
[52] Barnett, Steven, et al.
[53] Faiola, Anthony and Zachary A. Goldfarb. "China Tops Japan in U.S. Debt Holdings." 19 November 2008 The Washington Post. 22 November 2008.://www.washingtonpost.com/wpdyn/content/article/2008/11/18/AR2008111803558.html.
[54] Hsiao, Russell. "Global Crisis Presents Challenges and Opportunities for Chinese Economic Reform." *The Jamestown Foundation*. China Brief Volume: 8 Issue 20 http://www.jamestown.org/programs/chinabrief/single/?tx_ttnews%5Btt_news%5D=5199&tx_ttnews%5BbackPid%5D=168&no_cache=1.
[55] Xinhuanet, "India Proposes Price Band to Regulate Oil Prices," China Economic Net, June 24 2008
[56] Amadeo, Kimberly. "How Does the Government Regulate Exchange Rates?" http://useconomy.about.com/od/inflation/f/Regulate_Exch.htm
[57] Shan, Weijan, "Will China's Banking Reform Succeed?" 17 October 2005. *The Wall Street Journal.*
[58] Shan, Weijan.

exorbitant amount of money in order to garner prestige or to intimidate an international adversary; such behavior shows little, if any, consideration for economic interests.[59] It is possible that the ASAT test was intended to serve this exact purpose.

The People's Liberation Army (PLA) currently fronts the Chinese Space Program. As with most things from China, the amount of funding given to the space program, and the defense budget as a whole, is not readily released to the public. Estimation of the space program's resources is even more difficult when one considers all the dual-use technology applications prevalent in commercial space. Although China declared its defense budget of USD $22.3 billion, projections of the budget based on real exchange rates and Purchasing Power Parity models predict an expense range from USD$30.6 to $141billion.[60]

International Traffic and Arms Regulations (ITAR) and Validated End-User (VEU) Agreements prohibit the U.S. from exporting high end, dual-use technology to certain countries. This imposes an indirect cost to U.S. industry or government, as each item that is prohibited from exportation counts as lost revenue against the U.S. Moreover, other countries could simply purchase the high end technology from a different country in possession of the desired technology. The U.S., through these regulations, may be isolating itself from the international community.[61] In contrast to current U.S. Space Policy, a policy that promotes communication and cooperation with China might turn out favorably for all parties involved.

[59] Personal communication with Dr. Henry Herzfeld, Washington, DC
[60] United States. Annual Report to Congress: Military Power of the People's Republic of China 2007. *Department of Defense*. 2007. p.26.
[61] United States. Today's GAO Reports: September 25, 2008. *General Accounting Office: Report and Testimony*. 25 September 2008. http://www.gao.gov/daybook/080925.htm.

U.S. space projects often involve high start-up costs and, when they do not fulfill their ultimate mission, there is a large financial loss borne by the U.S. government.[62] Rather than requiring that all space equipment be manufactured in the U.S., the U.S. might be able to take advantage of foreign space assets to lower startup costs for new space ventures. This, however, would oppose current U.S. space policies and congressional acts regarding export regulations which present a unilateral approach to space.

The unilateral approach to space may appear standoffish amongst other states in the international community. Therefore, cooperation and talks with the Chinese and other countries would encourage a more peaceful environment. This cooperative approach could also prevent foreign states from militarizing space in a defensive maneuver in anticipation of perceived U.S. offensive tactics. U.S. economic and national defense policies go hand-in-hand, as the U.S. places great emphasis on national security and would sacrifice a degree of economic prosperity to preserve security. However, there can be a balance between national defense and economic policies. Diplomatic discussions on space technology and international law do not necessarily have to lead to disclosure of U.S. "secrets." Rather, such talks can serve as a symbol of international cooperation.

Chinese Space Program and its Place in the Economy

The Chinese space program is a symbol of China's national security and political interests kept in balance with its economic considerations. China's main priority with its space program is the

[62] Personal communication with Dr. Henry Herzfeld, Washington, DC.

peaceful use of space, but China will always act in the interest of national security if threatened.[63]

To be sure, there are many long term economic benefits to a space program that must be compared against the short term opportunity cost of doing other things with limited capital.[64] First, there are broad improvements in technology that will drive multiple sectors of the economy and increase revenues for Chinese companies. Second, the Chinese military will get "better communications capabilities, improved methods to spy on enemies, and more effective methods for commanders to move units around on future high-tech battlefields."[65] Finally, and perhaps most importantly, is the specialization and education of the labor force. The experience Chinese technology experts and engineers will gain by working on the space program is invaluable and will no doubt make the technical labor force much stronger, which could increase overall productivity of labor.

China also gains much strength from increased foreign direct investment (FDI). "As a result of the active government promotion through various policy measures, FDI in China has grown rapidly since 1978."[66] For example, contracted FDI inflow to China grew from USD $2.7 billion in 1984 to USD $153.5 billion in 2004. Utilized FDI also grew in that period from USD $1.3 billion in 1984 to USD $60.6 billion in 2004, with an estimated utilized USD $74.8 billion in 2007.[67] With increased capital coming into the country, China is able to use this capital to sponsor projects such as those in the Chinese space program, which will secure economic growth in the future. Increased

[63] Personal communication with Dr. Henry Herzfeld, Washington DC
[64] "China Hoping Space Program Will Boost Commerce and Security." 29 January 2003.Voice of America News. 13 September 2008. www.defense-aerospace.com/article-view/feature/18916/chinese-space-program-faces-funding-challenge.html.
[65] "China Hoping Space Program Will Boost Commerce and Security."
[66] Fung, K.C., Iizaka, H., & Tong, S. "Foreign Direct Investment in China: Policy, Trend, and Impact." June 2002. China's Economy in the 21st Century. 3 November 2008. http://www.hiebs.hku.hk/working_paper_updates/pdf/wp1049.pdf.
[67] Ministry of Commerce of the People's Republic of China. "The rise of foreign direct investment (FDI)." 3 November 2008. http://www.chinability.com/FDI.htm.

spending on the space program, however, comes as many Chinese people remain poor. There is a growing divide among the rich and poor as China moves toward a neo-classical market system.[68] Although per capita GDP is higher in China than it was previously,[69] many Chinese are being left behind the curve while a select few prosper. The International Monetary Fund (IMF) estimates China's per capita GDP at USD$5,325, which ranks it 100th in the world.[70] There are also a number of social issues, such as social security and healthcare, which would ordinarily necessitate some government funds that are not being addressed.[71] It seems that China has chosen to sacrifice social well-being in the foreseeable future for longer term economic and national security benefits.[72]

Economic Interdependence

China relies on its trade relationship with the U.S. as a means of securing foreign capital. Should this relationship be ruptured, possible consequences exist. While it is true that China's economy is secondary to its national security (as is the case with the U.S.), funding for the space program will stop if China cannot rely on foreign capital to finance the space program.[73] This suggests a degree of economic interdependence with the U.S., one that is likely to sustain itself for some time. It should be noted, however, that this is by no means a credible deterrent to a large-scale conflict that could occur in the Asia pacific region. But for now, it keeps things in order.[74]

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[68] "The Party Congress in China: China's Communists and the Peasants."11 October 2007. The Economist. 23 October 2008. http://www.economist.com/opinion/displaystory.cfm?story_id=9947069.
[69] World Economic Outlook Database-October 2008. 8 October 2008. *International Monetary Fund*. 11 November 2008. http://www.imf.org/external/pubs/ft/weo/2007/02/weodata/weoselser.aspx?c=924&t=1. (data refers to 2007).
[70] World Economic Outlook Database-October 2008.
[71] Gittings, John, The Changing Face of China: From Mao to Market. New York: Oxford University Press, 2006, p.27-28.
[72] Gittings, John.
[73] Gittings, John.
[74] Personal Communication with Dr. Wang, USC China Policy Institute, Los Angeles, CA

International Traffic and Arms Regulations

ITAR is a set of government regulations concerning the importation and exportation of defense-related articles and services on the U.S. Munitions List (USML).[75] In essence, ITAR regulations mandate that information and material concerning defense and military-related technologies can only be shared with U.S. personnel unless an exemption is sought or approval is received from the Department of State (DoS).[76] The list of ITAR regulated information is constantly changing.[77]

There is a major (albeit controversial) argument for the removal or discontinuance of ITAR regulations.[78] U.S. technology firms provide two reasons why they should not be subjected to ITAR regulations. First, U.S. firms spend exorbitant amounts of money procedurally proving that their technologies should not be classified as ITAR regulated technologies.[79] Second, concurrent with the first argument, U.S. firms cite potential lost profits as a result of ITAR regulations.[80] U.S. firms lose a tremendous market upside by being able to only sell specific technologies to specific markets.[81]

[75] United States. 1999 CFR Title 26, Volume 11. *Department of State*. 29 September 2008. http://www.access.gpo.gov/nara/cfr/waisidx_99/22cfr121_99.html.
[76] United States. 1999 CFR Title 26, Volume 11.
[77] United States. 1999 CFR Title 26, Volume 11.
[78] Weinberger, Sharon "Here We Go Again: Industry and Government Revisit United States Export Controls." 17 July 2006. *Aviation Week & Space Technology*. p.82.
[79] Weinberger, Sharon.
[80] Weinberger, Sharon.
[81] Personal communication with industry officials, Los Angeles California

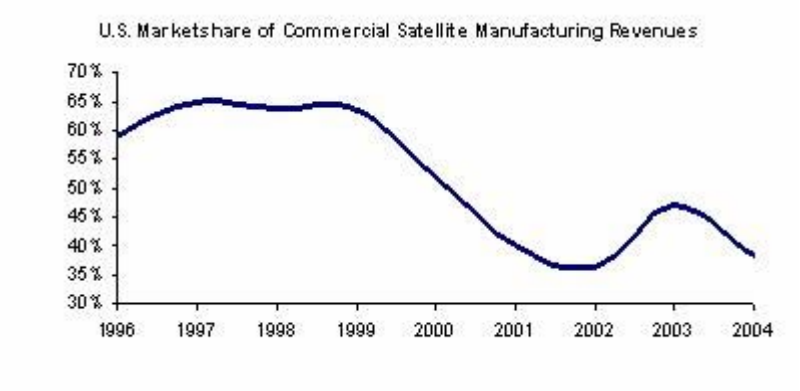

Figure 1: U.S. Marketshare of Commercial Satellite Manufacturing Revenues[82]

ITAR regulations have led to and will continue to lead to substantial economic losses.[83] Figure 2 depicts the downward trend of the U.S. marketshare of commercial satellite manufacturing revenues. The continuation of ITAR regulations correspond with a plummeting market share for U.S. satellite manufacturers. U.S. manufacturers have incurred ITAR related losses somewhere in the vicinity of USD$3-6 billion from the period 1996-2004.[84]

ITAR not only inhibits sales abroad, but the regulations deter international cooperation. Some U.S. contractors will not bid on foreign satellite contracts for wariness of ITAR regulations and their ability to overcome such obstacles. Accordingly, it has been said that ITAR cripples the U.S. commercial satellite industry without ending the transportation of the space assets it purports to regulate.[85] Ryan Zelnio, a researcher for the National Academy of Sciences, Public Policy, Washington DC. Zelnio finds that, since the change in export policy, "no Chinese satellite operator has chosen to purchase any satellite that is subject to US export regulations and have instead selected European and Israeli suppliers with over six satellite orders to date since

[82] Zelnio, Ryan. "A Short History of Export Control Policy." 9 Jan. 2006. The Space Review. 17 Oct. 2008. http://www.thespacereview.com/article/528/1.
[83] Zelnio, Ryan.
[84] Zelnio, Ryan.
[85] Barker,Geoffrey "Australian Aerospace Wins $1.5bn Bid." 27 April 2006. Australian Financial Review. p.6.

1999. This comes out to a loss estimated anywhere from $1.5 to $3.0 billion to the US economy.[86]"

This statement by Zelnio shows one of the major weaknesses in the current U.S. export control policy. Notice Zelnio says that China has not chosen to import any satellites from the U.S. Instead, China will simply import resources and parts from the U.S. and then build the satellite themselves, essentially purchasing a satellite for a cheaper price without the added cost of labor. Simply, the U.S. has created a system in which China is able to purchase all of the necessary materials to manufacture satellites by providing their personal experience in the process. International economic theory would say that it will only be a matter of time before China is able to mass-produce commercial satellites at a much cheaper price, thereby undercutting U.S. national security and the liquidity of its companies.

Foreign Manufacturing Companies have benefited from ITAR Regulations. Alcatel Alenia Space, an overseas joint venture, advertised in the early 2000s that it would build "ITAR Free" spacecrafts. Alcatel's market share has jumped 100 percent since this announcement, as the rest of the industry is losing bids and market share to foreign satellite manufacturers who are not subject to the same regulations.[87]

On a similar note, U.S. corporations that violate export controls often receive minimal punishment.[88] Specifically, Lockheed Martin was fined approximately USD$13 million for

[86] Zelnio, Ryan. "A Short History of Export Control Policy." 9 Jan. 2006. The Space Review. 17 Oct. 2008. http://www.thespacereview.com/article/528/1.
[87] Zelnio, Ryan.
[88] "PRC Theft of United States Nuclear Warhead Design Information." 9 October 2008. C-SPAN.

providing sensitive information to Chinese companies with regard to nuclear warhead design.[89] Oftentimes, this is not enough of a disincentive to halt such technology transfers.

ITAR has stalled an experience advantage that the U.S. has over the rest of the world. Despite this, in less than a decade this advantage may erode due to unwillingness of the U.S. to share its technology and cooperate with foreign designers. In the future the U.S. may want to alter its stance on export controls to promote international cooperation.

It is also essential to consider the relationship between export controls and matters of national security. In particular, outsourcing manufacturing centers abroad might create new risks. Economically, it would be more feasible and sustainable for the U.S.'s multi-national corporations to move to outside the country to manufacture supplies.[90] This measure is inherently problematic because it opens U.S. manufacturing centers to increased risk. Theft or another compromising action is much more likely in a foreign country such as China than at home. The problem is that in addition to cheaper manufacturing costs, U.S. manufacturing centers in China enjoy extremely hefty tax breaks.[91] Foreign owned corporations enjoy similar tax breaks if they move to the U.S., but U.S.-owned companies do not seem to have similar privileges[92]. It might be prudent for the U.S. government to offer defense tax deferrals or benefits to keep the majority of corporations within the U.S. for national security purposes. This recommendation seems satisfactory on both accounts due to the security benefits to the U.S. as a whole and the economic benefits enjoyed by the defense private sector.

[89] "PRC Theft of United States Nuclear Warhead Design Information." 9 October 2008. C-SPAN.
[90] Personal communication with Dr. Henry Herzfeld, Washington DC
[91] Clark, Douglas and Gabriela Kennedy, "Outsourcing to China-Risks and Benefits." *Computer Law & Security Report: 22.* 2006, p.250 – 253.
[92] Clark, Douglas, et al.

China and other adversarial countries are not the only international actors that have admonished the U.S. over ITAR regulations. Australian companies have won bids over U.S. companies in the past solely due to ITAR regulations[93] and Great Britain has openly spoken out against the ITAR regulations set forth by the U.S.[94] One of the major problems of the entire ITAR process is that some of the U.S.' most valuable allies are not exempt from the ITAR restrictions. This causes numerous issues in terms of fostering and sustaining key political relationships with allies. It may be seen as a gesture of goodwill and trust that our closest allies are exempted from these agreements. Moreover, it appears that ITAR regulations were meant to ensure that weapons did not come to the hands of terrorists and enemies, not to inhibit commerce with friendly nationstates.

Validated End-User Agreements

The Validated End User (VEU) agreements program is a promising regulation for high end, dual-use technology exports from the U.S. to China. Essentially, some of the most sensitive data and technology coming out of the U.S. falls under the jurisdiction of these new agreements. High end, dual-use technology exports amount to USD$17.7 billion. Currently only 1.7% of these exports is covered by VEU agreements. Theoretically, the VEU system works to ensure that only civilian candidate companies in China receive sensitive technology that cannot be transferred to a military institution[95]. Mario Mancuso, Undersecretary of Commerce, explains that the program "reduces the time, expense, and uncertainty in the licensing process and will make US exporters

[93] Clark, Douglas and Gabriela Kennedy, "Outsourcing to China-Risks and Benefits." *Computer Law & Security Report: 22.* 2006, p.250 – 253.
[94] "UK Warns US Over ITAR Arms Restrictions." 1 December 2005.Defense Industry Daily. 3 November 2008. http://www.defenseindustrydaily.com/uk-warns-usa-over-itar-arms-restrictions-01549.
[95] Mancuso, Mario. "The China Rule: One Year Later." 17 June 2008. *Bureau of Industry and Security*. U.S.-China Business Council. 27 October 2008. http://www.bis.doc.gov/news/2008/mancuso06172008.htm.

more competitive in China. It will also act as a powerful, market-based incentive, rewarding responsible practices by the many civilian firms in China that handle controlled technology with care."[96]

Unfortunately, there exist a few problems with this VEU approach.[97] First, this does nothing to ensure that transactions are not made in the future that compromise the security of sensitive technology, i.e., no measure is in place to ensure that once a Chinese company obtains this technology it does not trade it to a government sponsored organization. Second, and more importantly, the opaqueness of many Chinese enterprises presents a problem. The Chinese government has a financial stake in many corporations termed private. This means that the Chinese government would still have a presence in VEU licensed institutions and consequent access to sensitive technology exported by the U.S.

Accordingly, in order to foster better relations with China politically and economically, while maintaining national security, it is the opinion of this counsel that ITAR regulations be reviewed to be aligned with current national goals. ITAR regulations could be strengthened in the interest of national security, or they might be slackened in order to improve the commercial space industry. It is also the opinion of this counsel that Validated End User Agreements be further researched and implemented, especially if ITAR regulations are repealed.

[96] Mancuso, Mario. "The China Rule: One Year Later." 17 June 2008. *Bureau of Industry and Security*. U.S.-China Business Council. 27 October 2008. http://www.bis.doc.gov/news/2008/mancuso06172008.htm.
[97] Mancuso, Mario. "Enhancing Secure Trade with China." 18 June 2008. *Bureau of Industry and Security*. U.S.-China Business Council. 24 October 2008. http://www.bis.doc.gov/news/2007/mancuso06182007.htm.

Congressional Acts

Since the mid-1990s, there has been an increasing concern about China's military actions and access to advanced technologies.[98] The PLA continually expands its technological ability, often relying on foreign exports to reach its goals. Congress remains concerned regarding what effect this might have on the U.S. According to the DoD, about 0.5% of all American exports require an export license, with the majority of those items focused upon technology transfers.[99] While "only 2 to 3 percent" of license requests overall are denied, the U.S. has a very strict export control policy with China.[100]

The Late 1980s and 1990s

In 1988, an agreement between President Ronald Reagan and the Chinese government authorized China to launch U.S.-made commercial satellites.[101] The deal intended for nine launches within six years and set economic guidelines for the prices China could charge for each launch. However, Congress suspended exports of all U.S. satellites to China with the Tiananmen Square Sanctions Law.[102] From the U.S. perspective, the Tiananmen Square incident was a massacre of peaceful demonstrators and proof that "the PRC's leadership was not to be trusted."[103] This distrust of the Chinese continues to affect policies. The sanctions law (also called the State Department Authorization Bill) tightened U.S.-China sanctions, not only regarding satellite exports, but also regarding nuclear trade and cooperation.

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[98] Bolkom, Christopher, Shirley Kan, and Ronald O'Rourke. "China's Foreign Conventional Arms Acquisition: Background and Analysis." 10 Oct. 2000. *Congressional Resource Service.* 18 September 2008. http://www.fas.org/man/crs/RL30700.pdf.
[99] Shotwell, Charles B. "Export Controls: A Clash of Imperatives." The Global Century: Globalization and National Security. Ed. Richard L. Kugler and Ellen L. Frost. p 335-354. Washington: National Defense University Press, 2001. p 341.
[100] Shotwell, Charles B.
[101] Zelnio, Ryan. "A Short History of Export Control Policy." 9 Jan. 2006. The Space Review. 17 Oct. 2008. http://www.thespacereview.com/article/528/1.
[102] Dumbaugh, Kerry. "Current U.S. Sanctions Against China." 8 Feb. 1994. *Congressional Research Service*. 29 October 2008. http://digital.library.unt.edu/govdocs/crs/permalink/meta-crs-120:1.
[103] Dahl, Elizabeth: Dissertation Defense.

The Bush and Clinton administrations, however, sought to tilt the balance toward exporting by shifting export control decision for commercial satellites from the DoS Munitions Control List to the Department of Commerce (DOC) Control List.[104] Congress allowed the Export Administration Act of 1979 to lapse in 1994. The Clinton administration then "opened up billions of dollars of satellite sales to Chinese companies" in 1996 against the wishes of the Secretary of State.[105] This policy was reversed in 1998 as fears of espionage mounted.

Congress passed the Iran Missile Sanctions Act in 1998 over President Clinton's veto. This act targeted Russian and Chinese technology transfers to Iran. China's stance that their technology transfers were legal is "technically correct"[106] but the Cox Commission found that "U. S. aerospace firms and satellite makers allowed China to 'dramatically shorten the timetable'" for developing missiles that could reach the middle of America.[107]

Cox Commission and Phalcon Deal

In 1999, a bipartisan commission led by U.S. Representative Christopher Cox issued an 872-page report showcasing "a comprehensive and disturbing picture of China's efforts to obtain military technology to build modern nuclear missiles and other weapons that could threaten U.S. security and challenge U.S. interests in Asia."[108] The report details concerns about Chinese spies, political donations made to influence U.S. export policies, and China's purchase of technology for civil use that can also be used militarily. While many found the report "inflammatory" and

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[104] , Charles B. "Export Controls: A Clash of Imperatives." The Global Century: Globalization and National Security. Ed. Richard L. Kugler and Ellen L. Frost. p.335-354. Washington: National Defense University Press, 2001. p.341.
[105] Shotwell, Charles B.
[106] Timmerman, Kenneth R. "Long Beach Missile Transfers." The American Spectator. September 1998. p.48. qtd. by Charles B. Shotwell. "Export Controls: A Clash of Imperatives." The Global Century: Globalization and National Security. Ed. Richard L. Kugler and Ellen L. Frost. p.335-354. Washington: National Defense University Press, 2001.
[107] Timmerman, Kenneth R.
[108] Fisher, Jr., Richard D. "Time to Heed the Cox Commission's Wake-Up Call." 3 June 1999. *The Heritage Foundation.* 9 October 2008. http://www.heritage.org/Research/AsiaandthePacific/EM602.cfm.

felt it exaggerated China's capabilities,[109] it led to legislative reform of export controls and the prosecution of two U.S. companies for violations of the Arms Export Control Act. Loral Space and Communications Corporation and Hughes Electronics Corporation received fines totaling USD$46 million combined.[110]

Also in 1999, the Clinton Administration objected to Israel's intended sale of the Phalcon Airborne Early Warning (AEW) Radar after concerns that Israel would transfer the technology to China.[111] Reports differed on whether the Phalcon could target 60 or 100 targets simultaneously while guiding fighters.[112] Regardless of Phalcon's specific capabilities, China's access to this technology caused Congressmen such as Jesse Helms to state that U.S. security could be "put at risk" by the deal.[113]

Congress took bipartisan opposition to this deal, even seeking to withhold USD$250 million of economic aid if Israel transfers the technology to China, which corresponded with the value of the Phalcon sale.[114] Eleven months later, Israel canceled the Phalcon sale despite having almost completed the AEW aircraft.[115]

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[109] Di Capua, Marco, Lewis R. Franklin, McAlastair Iain Johnston, and W. K. H. Panofsky. "The Cox Committee Report: An Assessment." (Ed. M.M. May) Dec. 1999. 19 October 2008. http://iis-db.stanford.edu/pubs/10331/cox.pdf.
[110] Mintz, John. "2 United States Space Giants Accused of Aiding China." 1 Jan. 2003. The Washington Post 29 September 2008. http://www.sfgate.com/cgi-bin/article.cgi?file=/chronicle/archive/2003/01/01/MN153988.DTL.
[111] Slavin, Barbara. "Israel-China AWACS Deal Worries United States." 4 Nov. 1999. USA Today. qtd. by Ryan Zelnio. "A Short History of Export Control Policy." 9 Jan. 2006. The Space Review. 17 Oct. 2008. http://www.thespacereview.com/article/528/1.
[112] Zelnio, Ryan. "A Short History of Export Control Policy." 9 Jan. 2006. The Space Review. 17 Oct. 2008. http://www.thespacereview.com/article/528/1.
[113] Helms, Senator Jesse. Letter to Zalman Shoval at Embassy of Israel. 17 Nov. 1999. qtd. by Ryan Zelnio. "A Short History of Export Control Policy." 9 Jan. 2006. The Space Review. 17 Oct. 2008. http://www.thespacereview.com/article/528/1.
[114] Zelnio, Ryan.
[115] Zelnio, Ryan.

H.R. 5658: The Future?

The Duncan Hunter National Defense Authorization Act for Fiscal Year 2009 contains a section that discusses space business with China.[116] In May 2008, the act passed the U.S. House of Representatives 384-23 with 27 members not voting. The Senate has not yet voted on the Act, but is has been placed on the Senate Legislative Calendar.

The overall purpose of H.R. 5658 is to authorize appropriations for DoD and Department of Energy (DOE) activities for fiscal year 2009. Section 1233 concerns "classified contracts with foreign companies engaged in space business with China."[117]

H.R. 5658 seeks to limit China's access and development of ITAR-free satellites by not only prohibiting U.S.-China trade, but by also removing China's foreign trading partners. Specifically, H.R. 5658 states:

> [N]o funds appropriated pursuant to an authorization of appropriations in this Act or otherwise made available for the Department of Defense for fiscal year 2009 or any fiscal year thereafter may be obligated or expended under one or more contracts for classified work between the Department of Defense and a foreign-owned company if that company, or any parent, sister, subsidiary, or affiliate of that company, is engaged with China in the development, manufacture, or launch of ITAR-free satellites.[118]

On its face, the bill prohibits the U.S. from engaging in any cooperative activity with companies associated with China's access to ITAR-free satellites. But there are exceptions. In H.R. 5658, Section 1233 (a)(2), the Act states that the Secretary of Defense can usurp the Act if he certifies

[116] H.R. 5658: Duncan Hunter National Defense Authorization Act for Fiscal Year 2009. http://www.govtrack.us/congress/billtext.xpd?bill=h110-5658.
[117] H.R. 5658: Duncan Hunter National Defense Authorization Act for Fiscal Year 2009. Section 1233.
[118] H.R. 5658. Section 1233 (a)(1).

to Congress that (1) “no technology is being disclosed (intentionally or unintentionally) in a manner that may improve China's satellite, rocket, or missile capabilities; and [(2)] it is in the national security interests of the Department to continue to enter into contracts for classified work with the foreign-owned company.”[119]

The act will not immediately go into effect when passed. Instead, Section 1233(b) calls for a study from the Secretary of Defense regarding these measures, making sure that this control “promotes the national interest.”[120] However, export controls and technology transfers do not provide the only connection between the U.S. and China. Instead, their economies are more inter-connected than many people realize.

[119] H.R. 5658. Section 1233 (a)(2).
[120] H.R. 5658. Section 1233 (b)(2)(B).

CHINESE ASPIRATIONS AND BELIEFS

China's goals of increased economic prominence also correspond with the nationalistic focus of Chinese cultural beliefs. Chinese policy decision-making often stems from "a deeply-rooted sense of political insecurity and a burning desire for economic growth."[121] The Chinese often consider economic reform as a means to gain social stability, political control, and a nationalistic unification of its people, which will give the country great respect both in Asia and also worldwide.[122] China is advancing rapidly in both its economy and technological abilities and no current threat of foreign invasion allows China to focus upon its rising status. Still, China suffers from a sense of insecurity that clouds strategic decision-making. The history of this perceived vulnerability, as well as the importance of a growing nationalism in China, show why it is essential to understand Chinese cultural traditions before gauging Chinese strategic motivations and any U.S.-China relationship.

The Impact of Chinese Culture

"Culture is the root and foundation of strategy…Each country or nation's strategic culture cannot but bear the imprint of cultural traditions, which in a subconscious and complex way, prescribes and defines strategy making." [123] Chinese cultural history exerts a substantial impact on China's political and strategic actions as well as how the Chinese perceive international policies. Overall, the Chinese ideal is for China to become a prosperous global power prepared to rival the U.S. in its power and prestige while simultaneously maintaining cultural heritage and beliefs. This is

[121] Wang, Fei Ling. "Preservation, Prosperity, and Power: What Motivates China's Foreign Policy?" Nov. 2005. Journal of Contemporary China 14(45), 669-694.
[122] Bolkom, Christopher, Shirley Kan, and Ronald O'Rourke. "China's Foreign Conventional Arms Acquisition: Background and Analysis." 10 Oct. 2000. *Congressional Resource Service*. 18 September 2008. http://www.fas.org/man/crs/RL30700.pdf.
[123] Jijun, Li. "Lun Zhanlue Wenhua." 1997. Zhongguo Junshi Kexue [China Military Science] No. 1.

evident in Chinese strategic decision-making. For example, the 1998 China National Defense White Paper stated that "the defensive nature of China's national defense policy also springs from the country's historical and cultural traditions. China is a country with 5,000 years of civilization, and a peace-loving tradition."[124]

This Chinese statement offers insight into how the Chinese perceive themselves in two major ways. First, it shows the importance of China's fervent culturalism and nationalism. The Chinese intention to replace the U.S. as the foremost power in Asia is "driven by nationalist sentiment, a yearning to redeem the humiliations of the past, and the simple urge for international power." [125] Chinese nationalism is also intertwined with culturalism, as nationalistic pride coincides with the great respect given China's 5,000-year rich cultural heritage. Second, the statement shows how Chinese defense policies are sure to mention its peaceful intentions. China also often refers to their "no first use policy" for weapons and their peaceful possession of nuclear technology for minimal deterrence purposes. However, as with all public statements, a written Chinese policy saying that it has a "peace-loving tradition" might not be reflected in actual policies and actions. For example, how can China declare themselves as peaceful while also testing ASAT weapons and taking offensive measures in regional conflicts?

From the Chinese perspective, the U.S. continues to discuss peaceful intentions and advocate public diplomacy but continues to refuse to sign relevant treaties that aim to prevent the weaponization of outer space. For example, in February 2008, China and Russia formally submitted a draft of a Treaty on Prevention of the Placement of Weapons in Outer Space, or the Threat or Use of Force against Outer Space Objects at the Conference on Disarmament. The "use

[124] People's Republic of China. White Paper on China's National Defense. *Information Office of the State Council*. 27 July 1998. 27 Sept. 2008. www.china.org.cn/English/WhitePapers/NationalDefense/NationalDefense-3.html.
[125] Zhao, Suisheng. "China's Pragmatic Nationalism: Is it Manageable?" Winter 2005-2006.The Washington Quarterly 29:1 p. 131-144. Richard Bernstein and Ross H. Munro, "The Coming Conflict with America," March-April 1997*Foreign Affairs,*76, no. 2.. p.19.

of force" definition in the treaty significantly departed from a working paper in 2002 such that "use of force" now would encapsulate not only hostile counterspace activities leading to permanent and irreversible damage (such as destroying a satellite) but also to temporary and reversible showings of force (such as jamming a radio frequency).[126] The U.S. found it "unacceptable" and reiterated that "for nearly three decades, the U.S. has posited that it is not possible to develop an effectively verifiable agreement for the banning of either space-based weapons or terrestrial-based anti-satellite systems."[127]

Andrew Scobell coined the phrase "Cult of Defense" to explain the relationship between China's cultural traditions and this potential hypocrisy. The Chinese tend to view the world as one of constant change, exemplified by Confucian ideals. A dichotomy between words and actions is not seen as hypocrisy, but rather, as a continual shift in ideology.

Even when taking seemingly offensive actions in regional events, the Chinese perceive their military stance as peaceful. [128] This demonstrates Confucian ideals of pacifism and harmony, but also involves psychological tactics and a lack of transparency to gain a strategic advantage. Some schools of thought state that the Chinese consider themselves insecure and fearful of other states' aggressions, but it also might be the case that the Chinese enforce this perception so that they are consistently underestimated by other countries ignorant of their rapid rise. A lack of transparency, partly fueled by Xinhua, the Chinese news agency run by the Chinese Communist Party (CCP), only compounds the problem.

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[126]Rocca, Christina B. 19 Aug. 2008. Letter to Secretary-General of Conference Transmitting Comments on Draft "Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Objects" from the Permanent Representative of the United States of America. *Conference on Disarmament 1839.* 28 October 2008. http://rescommunis.files.wordpress.com/2008/08/cd1847.pdf.

[127] Rocca, Christina B.

[128] Scobell, Andrew. "China and Strategic Culture." 2002. *Strategic Studies Institute.* 7 October 2008. www.strategicstudiesinstitute.army.mil/pdffiles/pub60.pdf.

The Chinese are also adept at reframing events the world might see as offensive actions with defensive terminology. Just as the American South occasionally refers to the Civil War as the "War of Northern Aggression," China refers to the 1979 Sino-Vietnamese War as merely a conflict, despite estimates of 60,000 Chinese casualties.[129] Admittedly, most governments are skilled at justifying past involvement in conflicts. However, Chinese leaders often state how they are international weaklings compared to hegemons such as the U.S. and have been oppressed for centuries. With this viewpoint, any action China takes would be one of protection and self-defense rather than offensive attack. Even if China takes offensive action against smaller regional states, China's "just war theory" often employs reframing to support its stated pacifist stance. [130] Chinese officials are skilled in reframing all conflicts as "just" even when China invades foreign countries without provocation. [131] Even maneuvers intending to obtain land from surrounding countries are seen as "protecting China's interests" and "preventing encroachment."[132] In this manner, any conflict can be perceived as "just" as long as it benefits China's cultural and national interests.

Culturalism and Nationalism

To state that China currently intends to *rise* to power is inaccurate; instead, Chinese scholars refer to their *return* to power, as China dominated the Asia-Pacific region from 500-1500 A.D.[133]

[129] Howard, Russel D. "The Chinese People's Liberation Army: Short Arms and Slow Legs." Sep. 1999. INSS Occasional Paper 28: Regional Security Series. 3 Nov. 2008.
http://www.globalsecurity.org//military/library/report/1999/ocp28.htm.
[130] Howard, Russel D.
[131] Howard, Russel D.
[132] Howard, Russel D.
[133] Broomfield, Emma V. "Perception of Danger: the China threat theory." Journal of Contemporary China 12(35) (2003) (pp. 265-284).

The recent reemergence of Chinese nationalism began in the 1990s with a "rediscovery of China's glorious 5,000-year civilization." [134]

Chinese scholars such as Chen Zhimin believe that before the 20th century, China's policies were better defined through culturalism (the continuity of China's rich cultural heritage and values) than nationalism (focus upon the nation compared to others in the world).[135] In the culturalism approach, China implemented a universalism where the Chinese sought to convert "barbarians" to Chinese ideals.[136] Culturalism differs from nationalism because the Chinese do not see China as just a state; rather, the Chinese view China "as the universe."[137] Culturalism demands an ethnocentric approach focused solely on Chinese shared values, but nationalism permits foreign ideas only if they focus upon the prosperity of China and they do not result in foreign interference. Accordingly, strong social categorization occurred as China viewed the rest of the world as *others* outside of the Chinese in-group. The Great Wall of China exemplifies this social distancing.

This "us versus them" mentality continued through the 1990s and 2000s, although the Chinese realized that they must recognize themselves as one state in a global world in order to meet their goals of national prestige. Thus, even though China continues to focus upon its rich cultural heritage, it also has altered its economy and stance on international cooperation. China is no longer the entire universe, but a state seeking global power.

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[134] Callahan, William A. "Beyond Cosmopolitanism and Nationalism: Diasporic Chinese and Neo-Nationalism in China and Thailand."2003. International Organization 57 p. 481-517, p. 490.
[135] Chen Zhimin. "Nationalism, Internationalism, and Chinese Foreign Policy." Journal of Contemporary China. 14(42) (February 2005). Pp. 35-53.
[136] Chen Zhimin.
[137] Chen Zhimin at 27; citing Liang Qichao, 'Aiguo lun' ['On patriotism'], in *Yinbingshi heji* [*YinbingshiCollected Works*] (Beijing: Zhonghua shuju, 1989), Vol. III, p. 66.

An increased awareness of others also impacted China's nationalism, which "has come to replace communism as a uniting and legitimizing ideology for the CCP and the Chinese people."[138] Communism in China is not the traditional communism often discussed in the Soviet Union during the Cold War. Instead, China now proclaims its basic communist stances as ideals, while also embracing a market structure resembling capitalism.[139]

Despite China's increasing presence in international collaborations and the incorporation of Western styles and values, it has not lost its nationalistic pride. Chinese leaders now seem to realize that for China to become a global power based in nationalism, they must work alongside other countries. This modern nationalistic impulse is significantly softer than that of Maoist 1960s nationalism, which included slogans such as "world in chaos: excellent situation" and "down with American imperialism and its running dogs" who exist only on "decaying, weed-encrusted billboards at neglected street corners."[140]

Different types of nationalism also exist. Positive nationalism (also called pragmatic nationalism), for example, finds that China's lack of modernization led to Western influences taking hold.[141] This type of nationalism celebrates stability and using peaceful actions to garner economic expansion. The current Chinese nationalism is now referred to as "confident nationalism" because of China's expanding economy and increasing international prestige from recent events such as the 2008 Beijing Olympics and first Chinese space walk. In 1986, Michel Oksenberg stated that China's overriding aspiration is to "forge a tranquil security environment

[138] Broomfield, Emma V. "Perception of Danger: the China threat theory." Journal of Contemporary China 12(35) (2003) (pp. 265-284), p. 268.
[139] Broomfield, Emma V.
[140] Oksenberg, Michel. "China's Confident Nationalism." Foreign Affairs (1986)., p. 503.
[141] Chen Zhimin at 27; citing Liang Qichao, 'Aiguo lun' ['On patriotism'], in *Yinbingshi heji* [*YinbingshiCollected Works*] (Beijing: Zhonghua shuju, 1989), Vol. III, p. 66.

in support of ambitious domestic economic development."[142] More than 20 years later, the statement still rings true. China continues to hide its intentions and capabilities, but there has been a noticeable increase of Chinese participation in international conferences regarding issues such as disarmament, space technology, and satellite usage.[143] Some of this decreased transparency and increased cooperation emerges from China's desire to gain international economic ties to propel its economy and to show the world China's recent technological advances.

The current confident nationalism is often traced to distinguished Chinese scholar Zhang Zhidong. Born in 1837, Zhidong maintained a devotion to Confucianism while also declaring "Chinese learning as the essence, Western learning for practical development."[144] Chinese nationalism and culturalism can be embraced alongside foreign ideas that will strengthen the country and, ultimately, its international prestige. Furthermore, Russia no longer poses a security threat to China, as the U.S.S.R. did in the 1970s. During the Cold War, China shed some of its self-contained nationalism with a need for international cooperation with the U.S. and Japan in order to avoid the possibility of world war. When the U.S.S.R. no longer posed an immediate threat, China altered its strategy from one of international collaboration to one of independent growth. This collaborative atmosphere still exists, in part, today.

This transition can be seen in the changes of the military budget, as the percentage of the Chinese government budget devoted to the military fell from 15% in 1983 to 10% in 1985.[145] Oksenberg admits that any Chinese budget analyses are likely understatements, but still demonstrates that

[142] Oksenberg, Michel. "China's Confident Nationalism." Foreign Affairs (1986)., p. 503.
[143] Personal communication in D.C.
[144] Bays, Daniel H.. China Enters the Twentieth Century: Chang Chih-tung and the Issues of a New Age, 1895–1909. Ann Arbor: The University of Michigan Press (1978).
[145] Oksenberg, Michel.

the lack of an external national security threat can allow China to focus on its internal growth and foster "a glowing image of foreign investment and trade."[146]

Theorists following the "China threat theory" state that nationalism will be utilized as a support mechanism for expansion and future skirmishes regarding Taiwan and other countries surrounding the South China Sea.[147] Chinese nationalism can also resemble anti-U.S. sentiment. In 2003, for example, a senior Chinese diplomat stated that "Washington does not trust us at all and is still demonizing China and tries to contain China."[148] The U.S. is often seen as an enemy to China and "anti-Americanism has become a matter of national dignity."[149] China especially *needs* an enemy to point to as poverty and insecurity pervade the most recent picture of China's economy. While the Chinese economy is greatly expanding, poor economic situations "are officially explained away by Beijing either in terms of some evil international forces that are anti-China and want to suppress Chinese power, or that China is still weak and powerless and hence must lie low and bide its time."[150]

Despite feelings of weakness, Chinese nationalism also remains strong when the U.S. is considered an overly prideful country with "no ethical principles"[151] seeking to "rule the world"[152] while "spiritually polluting"[153] China. The Chinese believe that the U.S. defense culture worships technology, particularly space technology. Combined, these beliefs likely heighten an "us versus them" mentality of Chinese nationalism that also leads to a mistrust of the U.S. and its policies and stated peaceful intentions.

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[146] Oksenberg, Michel. "China's Confident Nationalism." Foreign Affairs (1986)., p. 503.
[147] Broomfield, Emma V. "Perception of Danger: the China threat theory." Journal of Contemporary China 12(35) (2003) (pp. 265-284), p. 268.
[148] Fei-Ling Wang. (citing Author's interview with top official at PRC Ministry of Foreign Affairs, Beijing, March 2003).
[149] Bernstein, Richard and Ross H. Munro. The Coming Conflict with China (New York: Alfred A. Knopf) (1997), p. 5
[150] Fei-Ling Wang.
[151] Scobell, Andrew, and Peng Huaidong, un zhan "Xi Zhan-Xhong guan zhi yancha yi." Zhongguo junshi kexue No. 1. 1997, p. 127
[152] Kristof, Nicholas, "The rise of China" Foreign Affairs 72(51) (November/December 1993) p. 73.
[153] Broomfield, Emma V..

Chinese officials and the Xinhua news agency, an arm of the CCP, have been incredibly successful at promoting and expanding this nationalistic pride as China aims to become "One Great Comprehensive Nation." However, leaders worry whether the country can ever live up to such strong nationalistic expectations among high levels of unemployment and poverty. This concern likely led to Deng Xiaoping's widely publicized 28-word statement that China should "keep a low profile" in the world. If China keeps a low profile during its meteoric rise, the Chinese believe they will be able to maintain nationalistic expectations more effectively while also reducing strategic pressure from the U.S., but the exact opposite may also be true.

Concerns about nationalistic expectations could also be alleviated by widely disseminated "prestige projects." Some theorists believe the international recognition from advancements in space technology and the marvel of the 2008 Beijing Olympics will offset "public dissatisfaction with official corruption and social injustice."[154] If this theory is correct, then it leads to its own concerns. It is expensive for any country, even one with lower operating costs such as China, to maintain an active space program. Worldwide economic concerns and the 2008 China stimulus package worth USD$586 billion show that China's economy is not indestructible.[155] In fact, China could lose a space race, "overstretch its resources, and collapse."[156]

The likely answer for China blends both sides and formulates a foreign relations plan that keeps a low profile and continues to slowly build, while also reminding the world of its capabilities through periodic acclaim. However, external analyses of Chinese political and economic actions

[154] Dellios, Rosita. "China's Space Program: A Strategic and Political Analysis." Culture Mandala 7(1) (Dec. 2005).
[155] Wiemer, Calla. "China's Stimulus Will Work." The Wall Street Journal. Opinion. November 12, 2008.
[156] Dellios, Rosita..

and motivations must determine how far China will go to "bring to an end the overlong century of humiliation and subordination to the West and Japan."[157]

Humiliation

National humiliation in China is a unique concept of self-victimization that celebrates national insecurities. This coincides with a celebration of the glories of Chinese civilization, which encourages nationalism. Accordingly, national humiliation and national salvation go hand in hand. But why would the Chinese celebrate something that shows their past weakness and insecurity?

National humiliation not only serves to show the disgraces of China's past, but it also recovers the grand civilization and strength they once had. "National humiliation discourse involves a very active notion of history and recovery."[158] The Opium War with the British in 1840 is seen as the beginning of a century of national humiliation.[159] The century of national humiliation is thought to end in 1949 with the rise of Mao Zedong and the CCP. This period is rife with incidents of foreign aggression and domestic corruption. It was not until 1915 when the Japanese issued their "Twenty-one Demands" that the term "century of humiliation" was made widespread.[160] When the Chinese government complied with the terms of the demands, the event was so appalling that the slogan "Never Forget National Humiliation" was popularized and spread throughout the country.[161]

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[157] Huntington, Samuel P. The Clash of Civilizations and the Remaking of World Order (New York: Simon & Schuster, 1996), p. 229.
[158]Callahan, William A. "National Insecurities: Humiliation, Salvation, and Chinese Nationalism." 14 Nov. 2008 <http://http://www.humiliationstudies.org/documents/callahanchina.pdf>.
[159] Callahan, William A.
[160] Callahan, William A.
[161] Callahan, William A.

When Mao Zedong rose to power and created the People's Republic of China (PRC) in 1949, the century of national humiliation was said to have ended because the country had restored itself to its pre-humiliation position. China considered itself the "Sick Man of Asia" during the century of national humiliation, but Mao's quick realization that China needed to industrialize allowed it to gain prestige that had existed before the British Opium War. [162]

National humiliation in China was used as stimulus. "The humiliation of a thing is sufficient to stimulate it; the humiliation of a country is sufficient to rejuvenate it."[163] The Chinese let their notion of humiliation guide their goals and objectives during the century of humiliation. "In other words, the narrative of national salvation depends upon national humiliation; the narrative of national security depends upon national insecurity."[164] The Chinese people never forgot the terrible things that occurred in their history. This remembrance led to increased willingness and effort to advance China and restore it to greatness.

China is not the only country to claim a history of national humiliation. An example is Abraham Lincoln's declaration during the Civil War that "April 30, 1863 is to be a day of national humiliation in order to encourage the restoration of our now divided and suffering country, to its former happy condition of unity and peace."[165] The Indians, Irish, Serbians, and Koreans have all also cited a day or period of national humiliation. While this notion is not widespread, it is present in the international system.

Even though the century of national humiliation is considered to be over, the Chinese government has continually used national humiliation to rouse its citizens to help restore China

[162] Callahan, William A. "National Insecurities: Humiliation, Salvation, and Chinese Nationalism." 14 Nov. 2008 <http://http://www.humiliationstudies.org/documents/callahanchina.pdf>.
[163] Callahan, William A.
[164] Callahan, William A.
[165] Callahan, William A.

to the great power it once was. For example, the 2001 U.S. spy plane collision over the South China Sea was regarded as "much more than [a] simple violation of Chinese sovereignty. It was seen as a moral problem, another in a long line of humiliations that China has suffered since the Opium War."[166] "While some scholars contend that it is time for China to stop being a victim and become more of a 'normal' country", Chinese notions of its "rightful place on the world stage continue to inform Chinese policy in both elite and popular discussions."[167]

Fear and Insecurity

Strong Chinese nationalism also plays directly into Chinese leaders' frequent feelings of insecurity. Chinese leaders often worry whether global powers such as the U.S. will seek to remove the CCP. Accordingly, China's political and military leaders are constantly on the lookout for threats and conspiracies[168] and often follow more conservative foreign policies, which will secure the CCP's political legitimacy.[169]

The Chinese sense of insecurity and fear might also be attributed to the power of the U.S. and its national space policy, which is often described as a "doctrine of space dominance."[170] With the current international political climate, countries like China look to U.S. actions in the Middle East and wonder whether the U.S. space policy follows the tenants of preemptive strikes. Countries aiming to become independent powers in space technology might spend time and

[166] Callahan, William A. "National Insecurities: Humiliation, Salvation, and Chinese Nationalism." 14 Nov. 2008 <http://http://www.humiliationstudies.org/documents/callahanchina.pdf>.
[167].Callahan, William A.
[168] Scobell, Andrew. "China and Strategic Culture." 2002. *Strategic Studies Institute*. 7 October 2008. www.strategicstudiesinstitute.army.mil/pdffiles/pub60.pdf.
[169] See also Fei-Ling Wang, "To incorporate China: a new policy for a new era', The Washington Quarterly, 21(1), (Winter, January 1998), pp. 67-81.
[170] Fei-Ling Wang, "To incorporate China: a new policy for a new era', The Washington Quarterly, 21(1), (Winter, January 1998), pp. 67-81.

effort making sure that they could withstand an aggressive U.S. space policy.[171] Furthermore, countries fearful of space globalization might also see an aggressive space policy as an attempt to negate the deterrence of nuclear weapons. This could prompt countries with nuclear capabilities to build up their space programs to remain a worldwide power.[172] However, it has been said that China is noticeably relieved that the U.S. remains focused on the Middle East instead of containing China's rise to power.[173]

Such views of the potential U.S. threat exacerbate already present fears, which serve to create a circular argument reminiscent of the violence escalation cycle discussed in psychological research (**Error! Reference source not found.**). Any event could start the violence escalation sequence (e.g., the Chinese ASAT test in January 2007 and the Chinese Embassy bombing in Belgrade), which would then cause the U.S. to perceive China as a threat to international space cooperation, while at the same time China would see the U.S. as a similar threat and seek to challenge its hegemony. Both sides have merit to their arguments, as access to space and dual-use technologies for both civilian and military organizations understandably cause insecurity. Accordingly, China's label of the U.S. as a hegemon that seeks to threaten or contain China could be seen as an appropriate response to U.S. policies and Congressional acts seeking to isolate China and prevent it from obtaining space technologies. While some progress has been made following the Cold War, many Chinese analysts remain highly critical of U.S. policies and see the U.S. as actively seeking to manipulate China and subvert its return to power.[174] In turn, the Chinese government's response often fuels the U.S. perception that China must be isolated

[171] Interview in Washington, D.C. on October 1, 2008
[172] Krepon, Michael and Christopher Clary. Assurance through Cooperative Means (Ch. 4). *Space Assurance or Space Dominance?* The Henry L. Stimson Center. Available at http://www.stimson.org/space/pdf/spacebook.pdf. (2003).
[173] Fei-Ling Wang.
[174] Chen, Rosalie. "China Perceives America: Perspectives of International Relations Experts." 2003. Journal of Contemporary China 12 , p 285-97.

and prevented from acquiring space technology. Constant suspicion likely results in continued mistrust between states, allowing the escalation cycle to continue. For international progress to be made, the escalation cycle must be broken before a space arms race emerges. This break can also emerge through reciprocal understanding of different cultures. China can learn much from the economic and diplomatic actions of global powers and the U.S. can strive to better comprehend Chinese culture and interpersonal relations.

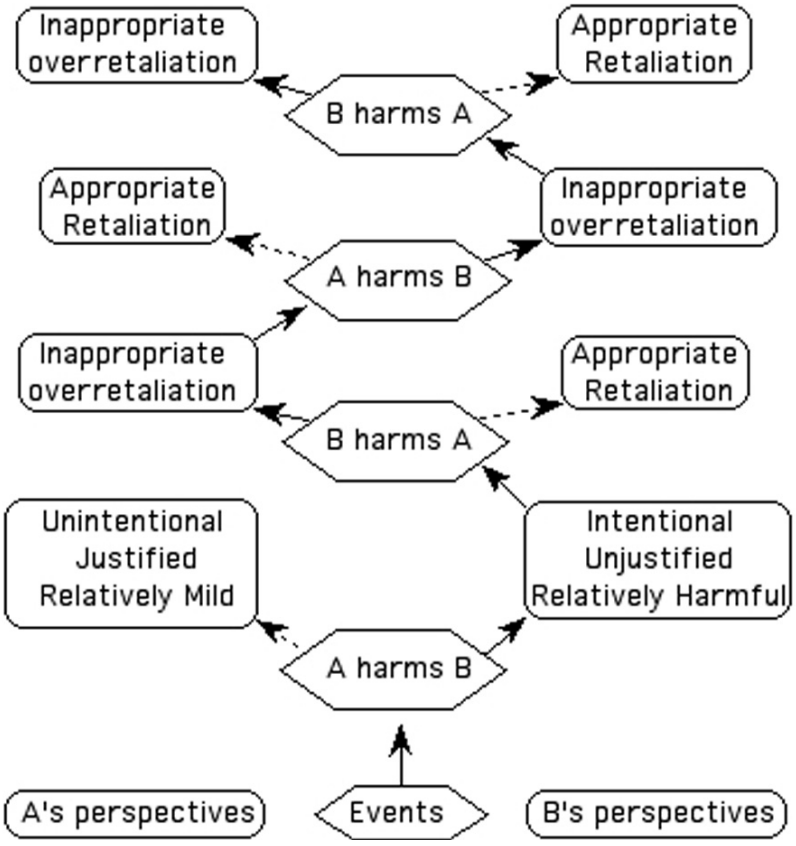

Figure 2: Violence Escalation Cycle[175]

[175] Anderson, Craig A. and Nicholas L. Carnagey. "Violent Evil and the General Aggression Model." The Social Psychology of Good and Evil. Ed. Arthur Miller. New York: Guilford, 2004. p 168-192.

Psychology, Culture, and Negotiation

Sino-U.S. relations often suffer from misperceptions and misunderstandings due to cultural differences. For example, while some Westerners believe that "when China signs a contract, it only means it's now time to start negotiations," others (i.e., Chinese and Western scholars alike) find this comment unfairly anti-Chinese and untrue.[176]

Marketing research literature provides a solid foundation for understanding cultural differences. The importance of Chinese culture in negotiation strategies can assist recommendations for improving U.S.-China relations in space. For example, research shows that East Asian cultures score much lower on individualism indices than Western cultures, especially the U.S.[177] The researchers also found that Western countries are more prone to focus upon short-term goals and rewards, while East Asian countries are more likely to focus upon the long-term. While long term orientation may relate to collectivist psychological mentality, seen in culturalism, it could also be an artifact of Confucian teachings of "perseverance and thrift."[178]

But how do these cultural psychological phenomena impact U.S.-China policy negotiations? Chinese countries, which tend to be more group-focused and relationship-based, will utilize clear hierarchies during any decision making process.[179] This long term focus can also lead the Chinese to be more patient as a longitudinal plan stays on a set trajectory, as opposed to the Western desire for quick, efficient answers to complex problems.

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[176] Interview in Washington, D.C. on October 1, 2008.
[177] Hofstede, G. Cultures and Organisations: Software of the Mind . Maidenhead: McGraw-Hill, 1991.qtd. by E. A. Buttery and T.K. P. Leung. "The Difference between Chinese and Western Negotiations." 2006. *European Journal of Marketing.* 32. p 374-89.
[178] Buttery, E. A., and T.K. P. Leung. "The Difference between Chinese and Western Negotiations." 2006. *European Journal of Marketing.* 32. p 374-89.
[179] Buttery, E. A., and T.K. P. Leung.

The building of long term relationships, often called *guanxi,* is not about immediately attaining any particular outcome. This Chinese principle does not correspond easily to the Western "tit for tat" mentality of immediate reciprocity. *Guanxi* constitutes two separate components. A strong in-group and out-group social categorization emerges where a barrier exists between insiders and outsiders. The Great Wall of China exemplifies this social distancing.[180] More positively, *guanxi* can also involve the constant giving of favors with no benefits provided in return.[181] Dr. Elizabeth Dahl, a political scientist at the University of Nebraska at Omaha, reports that "one knows that *guanxi* is beginning to develop when someone says, "*Meiyou guanxi*", a polite phrase that means literally 'there's no significance.'"[182] This highlights the interconnectedness between Chinese people and built-up trust. Policymakers must understand the longitudinal nature of this trust-building process to truly gauge Chinese beliefs. It is possible that the Chinese would not be willing to disclose long term plans and maintain open communication with other nations without first establishing long term trust or *guanxi*.

Persons seeking to understand Chinese intentions and motivations must also be aware of the importance of "face." This concept stems from *lian* (face) and *mianzi* (image), an older term strongly associated with reputation and prestige.[183] *Lian* refers to a collective, reciprocal respect for others while *mianzi* represents social identity and a person's community standing.[184] Accordingly, face combines both external and internal motivations. Maintaining face and positive images promotes harmony and relationship reciprocity.[185]

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[180] Dahl, Elizabeth. Dissertation, p. 77.
[181] Pye, L. "The China Trade: Making the Deal." 1986. *Harvard Business Review*. p 87-99.
[182] Dahl, Elizabeth. Dissertation, p. 77.
[183] Dahl, Elizabeth. Dissertation, p. 77.
[184] Huang, Donny. "Mentality, Mindset, Mianzi: How to Avoid a Crisis."4 July 2007. China Business Success Stories 10. Oct. 2008. http://www.chinasuccessstories.com/2007/07/04/mentality-mindset-mianzi-how-to-avoid-a-crisis.
[185] Lee-Wong, Song Mei. Politeness and Face in Chinese Culture. New York: Peter Lang, 2000. p 24.

A loss of *mianzi* can bring shame or disgrace not only to the individuals, but also to his or her family and affiliated groups. Losing face can swiftly revoke "one's ability to function effectively in society."[186] Accordingly, if one loses "face," it may be necessary for the person (or state) to "try to regain some prestige by taking some counter action(s), whether military, rhetorical, or some combination of the above."[187] Consequently, a showing of space dominance by one country might result in Chinese counteractions to prevent feelings of inferiority and maintain social prestige.

This counteraction might not always be a direct response to the threat. Chinese communication is often defined by an indirect style where the Chinese make tangential requests rather than get to the direct question. This often leads more direct states like the U.S. to perceive indirect cultures as "passive, weak, secretive and dishonest."[188] U.S. commentators often focus upon the lack of transparency in Chinese international relations as they wonder if this opaqueness stems from a desire of the Chinese to hide their technological capabilities. This again relates to *guanxi*, as the U.S. demands immediate answers to questions and China, instead, seeks to nurture long term relationships through less direct means. The U.S. directness could also be seen as selfish and proud rather than as self-assertive, thereby continuing China's negative perception of the U.S. [189]

Combined, these cultural findings suggest that any change in China-U.S. relations must first take into account the impact of Chinese culture and psychological motivations. These commonly-shared ideals can impact not only how the Chinese perceive U.S. space policies, but also how the Chinese act in response to or independent of U.S. policy. A strong sense of collectivism also

[186] Hsien, Chin Hu, "The Chinese Concepts of 'Face.'" 1944. *American Anthropologist,* 46, no 1, p 45.
[187] Dahl, Elizabeth. Dissertation, p. 77.
[188] Jia, Wenshan. "Sources of (Mis)perception and (Mis)understanding Between US-China Communication." 2006. *The Journal of Comparative Asian Development.* 5, 1. p 199- 210, p 202.
[189] Jia, Wenshan. p 203.

impacts judgments. As the Chinese saying goes, "Gun will kill the bird that sticks its head out."[190] Understanding the Chinese collectivist group mentality can explain the power that the Chinese government holds over its people as one idea from a top official can dramatically expand and impact national perceptions.[191] A nationalistic culture arising out of feelings of insecurity and humiliation is not always predictable, but the important role that these cultural motivations bring can offer a guiding light into such an opaque realm as Chinese policy decision making. Assessment of Chinese interpersonal relations and negotiation behavior suggests that the Chinese may not be willing to disclose long term plans or maintain open communication with other states without first establishing long term mutual trust. Thus, the U.S. could greatly benefit from considering Chinese culture and interpersonal relationship style.

[190] Buttery, E. A., and T.K. P. Leung. "The Difference between Chinese and Western Negotiations." 2006. *European Journal of Marketing.* 32.p 374-89.
[191] Huang, Donny. "Mentality, Mindset, Mianzi: How to Avoid a Crisis."4 July 2007. China Business Success Stories 10. Oct. 2008. http://www.chinasuccessstories.com/2007/07/04/mentality-mindset-mianzi-how-to-avoid-a-crisis.

UNITED STATES

The Status of the Space Program

At the present time, the U.S. has the most advanced and robust space program in the world. As of 2005, the U.S. had 413 satellites orbiting the Earth, in comparison to the 382 owned by the rest of the world.[192] Even Russia, who is the U.S.' closest competitor, only has 87 satellites in orbit.[193]. These 413 satellites are used to fulfill a number of services, including transmitting telecommunications and television signals, observing the Earth's surface, forecasting weather, and enabling GPS.[194] The uninterrupted provision of these services is crucial to the maintenance of integrated military operations, the protection of U.S. infrastructure, and the provision of goods and services that power the economy.

In the U.S., the most visible agency involved in space activities is The National Aeuronautics and Space Administration (NASA),[195] whose budget for fiscal year (FY) 2009 is almost USD$18 billion.[196] The DoD also has a space program, albeit a less visible one. In FY 2005, the DoD had a space budget of almost USD$20 billion.[197]

Despite its budget, NASA's manned space program will be temporarily put on hold in 2010 with the retirement of the current shuttle program in an effort to offset the costs of developing the new

[192] Shrader, Katherine. "United States Satellites Outnumber Rest of World." 07 Dec. 2005. Space.com. 19 Nov. 2008. http://www.space.com/news/ap_051207_us_satellites.html.
[193] Shrader, Katherine.
[194] "What do Satellites Do?" Suntrek. 19 Nov. 2008. http://www.suntrek.org/solar-spacecraft/satellites-rockets/what-satellites-do/what-satellites-do.shtml.
[195] Behrens, Carl E., Patricia Figliola, and Daniel Morgan. "U.S. Space Programs: Civilian, Military, and Commercial." 13 Jan. 2006. *Congressional Research Service*. 19 Nov. 2008. http://opencrs.com/document/ib92011.
[196] Cabbage, Michael and David Mould. "NASA Unveils $17.6 Billion Budget." 4 Feb. 2008. *NASA*. 19 Nov. 2008 http://www.nasa.gov/home/hqnews/2008/feb/hq_08034_fy2009_budget.html.
[197] Behrens, Carl E., Patricia Figliola, and Daniel Morgan.

Constellation program. [198] The goal of Constellation is to "…reach the moon by 2020, build a long term lunar base there and eventually send humans to mars."[199] Proponents of the program argue that it is necessary in order to speed the development of the new program. Opponents argue that the U.S. must maintain a manned presence both in space and on the International Space Station (ISS) without the aid of Russian transport.

In the interim, NASA astronauts will be dependent upon rides in Russian Soyuz capsules to reach the ISS until approximately 2014 when NASA's new space program will be ready for testing.[200] Howard McCurdy, a space expert from American University, commented that during the U.S. down-time, Russia will be the only country in the world capable of reaching space.[201] He points out that U.S. dependence on Russia will make it "…harder for the American government to take diplomatic action against the country especially in light of recent tensions between Russia and Georgia."[202]

While the potential break for NASA's manned shuttle missions may ultimately speed the arrival of the next generation of U.S. space exploration, U.S. prestige in space may be sacrificed.

Military and Industrial Reliance on Space Technologies

The U.S. utilizes space capabilities as the functional foundation of three primary realms of its power: civilian prosperity, commercial sectors, and military and intelligence operations. Following the massive incorporation of satellite systems into these domains since the 1960's, especially with the introduction of INTELSAT, U.S. national security and economic clout are

[198] Farrar, Lara. "Experts: Reliance on Russia makes NASA weak." 14 Apr. 2008. CNN. 19 Nov. 2008 http://edition.cnn.com/2008/tech/space/08/13/nasa.russia.soyuz/index.html.
[199] Schwartz, John. "Experts to Discuss United States Space Plan." 12 Feb. 2008. New York Times.19 Nov. 2008. http://www.nytimes.com/2008/02/12/science/space/12space.html?ref=space.
[200] Farrar, Lara.
[201] Farrar, Lara.
[202] Farrar, Lara.

now virtually synchronized with space technology. According to the 1999 U.S. National Security Strategy, "unimpeded access to and use of space is a vital national interest---essential for protecting United States national security, promoting our prosperity and ensuring our well-being."[203] Although the civilian, commercial, and military uses of satellites are interdependent, there is distinction among the usage of the three.

Civilian Reliance on Space

The general lifestyle of the U.S. public is well run by commercial space satellites. Such satellites are crucial for the country's telecommunications infrastructure and critically supporting the U.S. financial sector. These responsibilities include everything from banking to transportation, farming, Internet, disaster relief, and businesses' market participation.[204] Current synchronization with satellite systems makes possible the widespread use of cellular phones, credit card transactions, and radio and television broadcasting that comprise the hundreds of thousands of daily transactions which facilitate the U.S.' instantaneous access to people, goods, and services. These processes pump billions of dollars around the world through the commercial sector, as discussed below.

Commercial Sector Reliance on Space

The multinational space industry has a symbiotic relationship between governmental and commercial bodies.[205] Commercially, space is relevant in two different aspects. First, the general

[203] A National Security Strategy of Engagement and Enlargement. The White House: 1999 National Security Strategy (December 1999), Part II, p. 12.
[204] Haller, Linda L., and Melvin S. Sakazaki. "Commercial Space and United States National Security." 2001. *The Commission to Assess United States National Security*. Space Management and Organization. 28 Oct. 2008. http://www.fas.org/spp/eprint/article06.html#rft2.
[205] Waldrop, Elizabeth Seebode. "Integration of Military and Civilian Space Assets: Legal and National Security Implications." 2004. *The Air Force Law Review*. 55, p 166..

commercial sector is dependent on satellite systems to facilitate their services. Much of the revenue that U.S. companies generate is made possible by the use of satellites.

As an example, credit card companies rely on satellites to quickly transmit monetary transactions across the globe so that consumers are able to maximize their purchasing capabilities. Even businesses that do not directly utilize satellites for profit are still members of the satellite system in that they may accept credit cards or use the internet. The U.S.' accelerated global communication system and many other parts of the economy would be rendered useless and archaic without the capabilities of satellites.

The second component of the commercial sector is the space market itself, which is made up of the production of and access to space assets. Research and development in the commercial industry stimulate new technologies. International and domestic trade partnerships with commercial entities can reduce costs and increase space capabilities. The U.S. DoD stated in its Space Policy that "multinational alliances can increase U.S. space capabilities and reduce costs, as well as give the U.S. access to foreign investment, technology and expertise."[206] One of the largest portions of the space industry is the commercial satellite industry. According to the Satellite Industry Association, the world satellite industry has had an average annual growth of 11.5% from 2002 to 2007. A large majority of those satellites are used for communications purposes. In 2004 alone, the telecommunications industry reported service revenues of USD$292 billion.[207]

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[206] UNITED STATES DEP'T OF DEFENSE, DIR. 3100.10, SPACE POLICY page 6 (M. 9, 1999)[hereinafter SPACE POLICY]. The NCA are "the President and the Secretary of Defense or their duly deputized altemates or successors." UNITED STATES DEP'TOF DEFENSE, JOINT PUB. 3-0, DEPARTMENT OF DEFENSE DICTIONARY OF MILITARY AND ASSOCIATED TERMS page 253 (Mar. 23,1994).

[207] Lynch, Kenneth and Jim Lande. "Telecommunications Industry Revenues 2004." 2006. *Federal Communications Commission*. 7 October 2008. http://www.caltelassn.com/Reports06/Wireline/telerev04.pdf.

Military and Intelligence Operations Reliance on Space

In the wake of the Cold War, space was quickly growing in importance to the U.S. military. Satellites were especially useful in intelligence gathering and National Technical Means (NTM) for verifying the compliance of strategic arms limitations.[208] Since then, the U.S. military has harnessed space capabilities during peace and war as a "force multiplier" or "force enabler" because space access has drastically empowered the lethality and effectiveness of U.S. weapons and ground, air, and naval forces.[209] The streamlined strength of U.S. defense forces is a by-product of technological superiority and prowess. This superiority requires a relentless pursuit of forward-looking development and cooperation with the commercial sector. "From a military perspective, national security in large part depends on predictable, guaranteed access to space, which in turn depends on a strong domestic space industry."[210]

Operation Desert Storm

In the early 1990s, the U.S. military acknowledged the indispensability of satellite communications (SATCOM) when 80% of theater communications for Operation Desert Storm were provided by satellites.[211] A declassified briefing, Space Command Report from Operation Desert Storm, was released to explicate lessons learned from the Operation and to offer recommendations for the future of the U.S. military with space capabilities. The report emphasized the importance of timelessness in data delivery[212] and the precision that GPS

[208] Lynch, Kenneth and Jim Lande. "Telecommunications Industry Revenues 2004."
[209] Stares, Paul B. Space and National Security. Washington, D.C.: Brookings Institution Press, 1987. qtd. by Major Elizabeth Seebode Waldrop. "Integration of Military and Civilian Space Assets: Legal and National Security Implications." 2004. *The Air Force Law Review*. 55, p 160.
[210] Waldrop, Elizabeth Seebode. "Integration of Military and Civilian Space Assets: Legal and National Security Implications." 2004. *The Air Force Law Review*. 55, p 166..
[211] United States. United States Space Command Operations Desert Shield and Desert Storm. *US Space Command*. January 1992. pg 3.
[212] United States. United States Space Command Operations Desert Shield and Desert Storm. pg 1.

offered, "to virtually every weapon system in theater."[213] Through highly accurate navigation, the military was able to greatly diminish its number of aborted missions due to unstable conditions (i.e., bombs could be targeted even during bad weather and at night). Even further, the Defense Support Program (DSP) satellites offered a "significant element of flexibility to respond to global contingencies"[214] and to detect Tactical Ballistic Missile (TBM) launches to provide strategic missile warning.[215]

Commercial and Military Interdependence

With the commercial sector as one of the dominant players in space, there is a competitive international market for space services. U.S. policy encourages the interdependence of military and commercial entities because the commercial sector is better able to provide services such as earth imagery, communications, and launch services. A U.S. congressionally-mandated government commission recognized in its assessment of space issues that the U.S. is "increasingly dependent on the commercial space sector to provide essential services for national security operations."[216] Ironically, the military has often depended on non-U.S. commercial space services during times of crisis. During Operation Desert Storm, the military used the French SPOT satellite imagery provider.[217] "Military, civilian governmental, and commercial space systems all rely on the same space industry (which means the identical pool of experts, and therefore the same pool of knowledge) to develop, service, and often even maintain space

[213] United States. United States Space Command Operations Desert Shield and Desert Storm. pg 4.
[214] United States. United States Space Command Operations Desert Shield and Desert Storm. pg 8.
[215] United States. United States Space Command Operations Desert Shield and Desert Storm. pg 9.
[216] Haller, Linda L., and Melvin S. Sakazaki. "Commercial Space and United States National Security." 2001. *The Commission to Assess United States National Security*. Space Management and Organization. 28 Oct. 2008. http://www.fas.org/spp/eprint/article06.html#rft2.
[217] Haller, Linda L. and Melvin S. Sakazaki.

systems."[218] Goals of national security are only achieved by maintaining a healthy domestic industrial base in space technology and government policies that support international competitiveness.[219]

[218] Waldrop, Elizabeth Seebode. "Integration of Military and Civilian Space Assets: Legal and National Security Implications." 2004. *The Air Force Law Review*. 55, p 163.
[219] Haller, Linda L., and Melvin S. Sakazaki. "Commercial Space and United States National Security." 2001. *The Commission to Assess United States National Security*. Space Management and Organization. 28 Oct. 2008. http://www.fas.org/spp/eprint/article06.html#rft2.

COMPARATIVE SPACE POLICIES

An examination of the guiding principles of Chinese and U.S. space programs can be useful in shedding light upon what each views as the other's contradictory stance on the use of outer space. Chinese policy, in the eyes of American analysts, lacks transparency and is misrepresentative of true Chinese intentions. In contrast, American policy viewed from an international perspective can be interpreted as aggressive or unilateral. It is therefore in the best interest of the U.S. to give careful consideration to an analysis of Chinese policy and action as well as to identify and mitigate negatively perceived U.S. policy language.

Chinese Policy

Statements about China's intentions in space are very direct. According to an administrator of China's National Space Administration in 2004, "the development of outer space should be for peaceful applications and for the benefit of people from all nations" and "the Chinese government advocates closer international space cooperation based on equality, mutual benefit, and common progress." [220]

A 2006 Chinese white paper released by the Information Office of the State Council of the PRC also identifies efforts directed at international cooperation being taken by the Chinese space program. The document makes very clear that the PRC views space as the "common wealth of all mankind" and that every country in the world has the right to freely explore, develop, and

[220] Laiyan, Sun. "Statement by Administrator of China National Space Administration Mr. Sun Laiyan at UNGA 59th Session on the Exploration and Peaceful Uses of Outer Space." 20 Oct. 2004. *United Nations General Assembly 59th Session on the Exploration and Peaceful Uses of Outer Space*. New York. 12 Nov. 2008. http://www.china-un.org/eng/xw/t166126.htm.

utilize outer space and celestial bodies.[221] Further, the document stresses the Chinese principle of self-reliance while valuing cooperation with developed countries. The white paper concludes with "priority cooperation areas," which exemplify that China seeks to not only be self-reliant, but also intends to take part in international exchanges and enhanced cooperation in space. These areas include scientific research, data sharing and satellite services, communications, commercial satellite launching services, and the training and exchange of personnel in various fields of space activities.[222] Altogether, the Information Office of the State Council of the PRC describes a peaceful pursuit of space technology and an eagerness to engage in international trade and transfer of technologies.

China's publically available defense white papers, written by Chinese authors, are a good source of relevant policy information as well. They reflect the rapidly changing global political climate and China's desire to protect its assets and infrastructure. According to a National Defense White Paper issued by China in 2004, informationalization, as well as "asymmetrical, non-contiguous and non-linear operations," has become some of the most important factors in enhancing the capabilities of its military.[223] The change from mechanization to informationalization constitutes a shift in the way wars are fought, giving a strategic advantage to those with increased technological capabilities.[224] The ability to utilize satellite information like GPS feeds, and to deny these to an opponent, can produce a considerable advantage in battle. A crucial component of informationalization is the use of space and space-based assets like satellites. The policy further articulates an interest in the peaceful development of outer space and the maintenance of

[221] People's Republic of China. China's Space Activities in 2006. 12 Oct. 2006. *Information Office of the State Council*. China National Space Administration. 18 Sept. 2008. http://www.cnsa.gov.cn/n615709/n620681/n771967/79970.html.
[222] People's Republic of China. China's Space Activities in 2006.
[223]People's Republic of China. China's National Defense 2004: The Security Situation. 2005. *Information Office of the State Council*. World Security Institute. 18 Sept. 2008. http://www.wsichina.org/space/subprogram.cfm?subprogramid=5&charid=1.
[224] People's Republic of China. China's National Defense 2004: The Security Situation.

a defensive, rather than offensive, posture. It maintains that the impetus for modernizing its armed forces is to ensure national security and the construction of a prosperous society.[225]

Surges in the growth of Chinese high technology resulting from a renewed cultural motivation and the tendency to leapfrog generations of technology raise concerns regarding the safety of U.S. space assets. [226] As Chinese technology advances, so too does their ability to strike at the space infrastructure of other nations. Chinese researchers point out that China is not the first country to possess space-based weapons like anti-satellite missiles or microsatellites. Nor does it possess the most advanced technology in the world. They contend that China should not be seen as a great threat to others for these reasons.[227]

Chinese Policy Versus Practice

China's growing military and space capabilities are of obvious concern to the U.S. Chinese literature identifies the growth of space and defense capabilities as peaceful and fundamental to the modernization of its national defense.[228] Many experts argue that space-based weapons and technology are much better suited for offensive than defensive purposes because they are capable of launching powerful attacks quickly, but are very vulnerable to attack themselves.[229] For this reason, these weapons are much more useful in preemptive, rather than defensive, operations. Although the Chinese effort to modernize their defensive and offensive capabilities is legitimate, one should not forget where the strengths of space-based technologies lay when considering Chinese intentions.

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[225] People's Republic of China. China's National Defense 2004: National Defense Policy. 2005. *Information Office of the State Council*. 2005. World Security Institute. 18 Sept. 2008. http://www.wsichina.org/space/subprogram.cfm?subprogramid=5&charid=1.
[226] People's Republic of China. China's National Defense 2004: National Defense Policy.
[227] Xianqi, Chang. "Active Exploration and Peaceful Use of Outer Space." China Security 2 (2006): 16-23.
[228] Xianqi, Chang.
[229] Blazejewski, Kenneth S. "Space Weaponization and US-China Relations." 2008. Strategic Studies Quarterly. *Air University*. 23 Oct. 2008. p 37. <http://www.au.af.mil/au/ssq/2008/spring/blazejewski.pdf>.

In the 2007 paper Challenges in the Multipolar Space-Power Environment, U.S. Air Force Captains Matthew M. Schmunk and Michael R. Sheets outline key messages from Chinese writings. They believe that China's recent growth in science and technology, fostered by a rising number of Chinese nationals graduating with science and engineering degrees from Chinese and foreign universities, will lead to a strong base to build a "space cadre" or space force.[230] The purpose of this could be to expand China's space and technology base, as they seek economic expansion into advanced technological realms. Furthermore, some such as Colonel Wu Tianfu state that high-tech education is essential in the "space war century."[231]

Once assembled, the authors believe that this space force will begin implementing a space control doctrine focused on three distinct elements:

- Integrating superior space navigation, reconnaissance, and communications systems into military strategy.
- Learning to utilize space as a physical battleground where technology such as ASATs can be implemented to deny others' space power.
- Advancing far-ranging technologies that allow rapid reaction and long-range capabilities.

The first phase to space control utilizes space as an information battlefield, where advanced space and communications technology will allow dual-use technologies to flourish within a strategic military framework. The perceived importance of this element comes from China's analysis of Taiwan's major weaknesses. Taiwan lacks early warning satellites and is heavily

[230] Schmunk, Matthw M. and Michael R. Sheets. "Challenges in the Multipolar Space-Power Environment." *Fairchild Research Information Center*. Maxwell Air Force Base, AL: Air University Press, 2007, p 13. 11 October 2008. http://aupress.au.af.mil/fairchild_papers/shmunk/schmunk.pdf.
[231] Schmunk, Matthw M. and Michael R. Sheets. p 14.

dependent on other countries for satellite technology.[232] Accordingly, China seeks to prevent any heavy dependence on foreign countries as it becomes a space power. This is true whether China aims to become an independent, peaceful user of space, or one preparing for space control, as Schmunk and Sheets believe.

The second phase focuses on "capturing" space power. For some, this preparation for attack is necessary because "space war is no longer a fantasy, it is a fact that cannot be avoided."[233] Schmunk and Sheets focus on four different types of potential attacks. First, *acupuncture attacks* are specialized attacks such as jamming or destroying important facets of foreign control systems. Second, blinding attacks use *soft attacks* to blind technology such as spraying chemicals on a satellite's sensors to blind it. Third, *kill-the-body* attacks involve interception satellites or space mines which are hidden in orbit until a target approaches and the satellite or mine launches itself toward the target. Finally, *attack-the-heart* attacks use kinetic-energy weapons to attack the main system of an enemy target (control, power source, etc.).[234] To use any of these technologies, of course, China must maintain a strong base of skilled engineers and capable facilities.

Schmunk and Sheets declare the third phase as the "most romantic," but admit it is "pure speculation."[235] This final phase includes high-power lasers, space-depot ships, and advanced Chinese space technology prepared to capture military power from foreign countries such as the U.S. Schmunk and Sheets highlight an analysis by Chinese scholars that indicated that space

[232] Honglin, Sun and Li Jian. "C4ISR Is Taiwan's 'Weak Spot'" 21 March 2005. PLA Daily. 7 October 2008. http://www.chinamil.com.cn/site1/jsslpdjs/2005-03/21/content_163893.htm.
[233] Shanghai National Strategy Defense Research Institute. "21st Century Space Soldiers and Space Wars." *China National Defense Education Network.*
[234] Schmunk, Matthw M. and Michael R. Sheets. "Challenges in the Multipolar Space-Power Environment." *Fairchild Research Information Center*. Maxwell Air Force Base, AL: Air University Press, 2007, p 17-18. 11 October 2008. http://aupress.au.af.mil/fairchild_papers/shmunk/schmunk.pdf.
[235] Schmunk, Matthw M. and Michael R. Sheets.

troops physically assaulting a space station could be a reality by 2030.[236] The potential realization of any of these phases, and whether China's space policy is offensive or an independent attempt at space prestige, of course, must be inferred from analyses of publicly available documents. Accordingly, whether these public white papers accurately reflect privately held beliefs regarding the use of space, is up for debate.

Further speculation into Chinese leaderships' space intentions includes the fact that the Chinese have also considered the possibility of a space-based conflict with the U.S. This consideration is not necessarily indicative of malevolent Chinese intentions toward the U.S; however, published Chinese research on the topic is worth considering. Chinese strategists are aware of the U.S. reliance upon space-based assets and have acknowledged the comparatively superior conventional military abilities of the U.S. They point out that "for countries that can never win a war with the U.S. by using the method of tanks and planes, attacking the U.S. space system may be an irresistible and most tempting choice."[237] This statement is representative of the Chinese strategy of asymmetric warfare in which a superior military can be defeated by an inferior military that focuses on its weaknesses. For the U.S., that weakness is a heavy reliance upon satellite transmissions to coordinate everything from GPS signals to credit card transactions. Dr. Larry Wortzel, an authority on issues such as China-U.S. policy and national security, states that one of the most damaging things the PLA could do would be to "neutralize the United States' ability to use tracking and data relay satellites, which provide global, real-time sensor and

[236] Schmunk, Matthw M. and Michael R. Sheets. "Challenges in the Multipolar Space-Power Environment." *Fairchild Research Information Center*. Maxwell Air Force Base, AL: Air University Press, 2007, p 18. 11 October 2008. http://aupress.au.af.mil/fairchild_papers/shmunk/schmunk.pdf.
[237] Saunders, Phillip C. "China's Future in Space: Implications for U.S. Security." 20 Sept. 2005. adAstra. 30 September 2008. http://www.space.com/adastra/china_implications_0505.html.

communications capabilities for networked operations."[238] Disabling these satellites would effectively cut off communication and make coordination of U.S. war efforts much more difficult. Again, this strategy emphasizes a preemptive approach that could potentially reap massive benefits in a conflict with the U.S.

If an armed confrontation between the U.S. and China were to occur, the advantage could be shifted in China's favor with the destruction of critical U.S. satellites just prior to conflict and before the satellites could be used to make a decisive strike. Surprise attacks have in fact been key components of PLA opening campaigns in the past, as in Korea in 1950, India in 1962, and Vietnam in 1979.[239] The importance of surprise is emphasized in a translation of a portion of Houqing Wang and Xingye Zhang's *Science of Campaigns*:

> It is imperative that China launch a preemptive strike by taking advantage of the window of opportunity present before the enemy acquires a high-tech edge or develops a full-fledged combat capability in the war zone. Through a preemptive strike, China can put good timing and geographical location and the support of the people to good use by making a series of offensive moves to destroy the enemy's ability to deploy high-tech edge in the war zone, thus weakening its capacity to mount a powerful offensive. This is the only way to steer the course of the war in a direction favorable to China. [240]

Officially, China does have a defensive national security policy. It states that China's view of the uses of space is peaceful and directed toward shoring up national defense and benefiting mankind in general. Still, the reality of space technologies cannot be ignored. Chinese strategists

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[238] Wortzel, Larry M. "The Chinese People's Liberation Army and Space Warfare." 2007. American Enterprise Institute for Public Policy Research. 29 September 2009. p 1-20. http://www.aei.org/publications/pubid.26977/pub_detail.asp.

[239] Orletsky, David, David Schlapak, and Barry Wilson. "Dire Strait? Military Aspects of the China-Taiwan confrontation and Options for United States Policy." 2000. *RAND Corporation*. 10 Oct. 2008. http://www.rand.org/pubs/monograph_reports/2007/mr1217.pdf.

[240] Burles, Mark, Michael S. Chase, Roger Cliff, Derek Eaton and Kevin L. Pollpeter. "Entering the Dragon's Lair: Chinese Antiaccess Strategies and Their Implications for the United States." 2007. *RAND Corporation (Project Air Force)*. 29 October 2008. http://www.rand.org/pubs/monographs/2007/RAND_MG524.pdf.

have not overlooked the advantage to be gained through surprise and preemption.[241] In the event that tensions between the U.S. and China boil over the possibility of a preemptive strike at U.S. space assets should be considered. China's energetic pursuit of space-based assets increases its capability to strike at the U.S. space infrastructure. Such a strike could have a crippling effect on both military and economic operations.

United States Policy

In 2006, the U.S. updated its National Space Policy. The policy articulates the position of the U.S. in space issues and sets forth general principles, guidelines, goals and policies for the space program as well as addressing international space cooperation and effective export control policies.[242]

Principles

The principles set out by the 2006 U.S. National Space Policy state that the U.S., like China, is committed to the peaceful exploration of space by all nations for peaceful purposes and that the U.S. will seek cooperation with other space faring nations to enhance space exploration and promote freedom around the world. Further, the policy states that the U.S. will reject any claims to the sovereignty of space and will deny the use of space to adversaries with hostile intentions. Finally, the policy states that the U.S. will reject arms control agreements or restrictions that

[241] Burles, Mark, Michael S. Chase, Roger Cliff, Derek Eaton and Kevin L. Pollpeter. "Entering the Dragon's Lair: Chinese Antiaccess Strategies and Their Implications for the United States." 2007. *RAND Corporation (Project Air Force)*. 29 October 2008. http://www.rand.org/pubs/monographs/2007/RAND_MG524.pdf.
[242] United States. 2006 Unclassified U.S. National Space Policy. 31 Aug. 2006. *Office of Science and Technology Policy*. 11 Nov. 2008 <http://www.ostp.gov/galleries/default-file/Unclassified%20National%20Space%20Policy%20-%20FINAL.pdf>.

impair its' ability to "conduct research, development, testing, and operations or other activities in space for U.S. national interests."[243]

Goals and Guidelines

The 2006 Space Policy also sets goals for the U.S.' use of space. In summary, the policy states that the U.S. will use space to strengthen leadership and national security, enable unhindered use of space, gain the benefit of exploration and discovery of outer space, enable a globally competitive domestic commercial space sector, and to encourage cooperation with foreign nations that will result in mutual benefit.[244] In order to achieve these goals, the policy sets out several guidelines in order to develop space professionals, improve space system development and procurement, increase and strengthen interagency partnerships, and to strengthen and maintain U.S. space-related science, technology, and industrial base.[245]

International Space Cooperation

The U.S. pursues international cooperation in space activities provided they are appropriate and consistent with U.S. national security interests and produce mutual benefit. The 2006 National Space Policy identifies space exploration and the development of a global Earth observation system as two potential areas for cooperation.[246]

[243] United States. 2006 Unclassified U.S. National Space Policy. 31 Aug. 2006. *Office of Science and Technology Policy*. 11 Nov. 2008 <http://www.ostp.gov/galleries/default-file/Unclassified%20National%20Space%20Policy%20-%20FINAL.pdf>.
[244] United States. 2006 Unclassified U.S. National Space Policy.
[245] United States. 2006 Unclassified U.S. National Space Policy.
[246] United States. 2006 Unclassified U.S. National Space Policy.

Effective Export Policies

Regarding the use of export policies, space-related exports are to be viewed favorably under the terms of the 2006 National Space Policy. Exports of a sensitive nature, however, will be approved for export on a case-by-case basis only. This limitation is in place to ensure control over the release of technologies with capabilities superior to those in current or near future use by foreign systems.[247]

Reactions to United States Policy

Foreign nations such as China question the intent of the U.S. National Space Policy. Changes made to the language of the document in the Bush administration's 2006 revision, in addition to the precedent set by the U.S. in pulling out of the Anti Ballistic Missile treaty (ABM) in 2002 and a vote against the PAROS agreement in the UN in 2005, have made the U.S. approach to the use of space appear very unilateral. This is consistent with the principle in the National Space Policy that states "Proposed arms control agreements or restrictions must not impair the rights of the U.S. to conduct research, development, testing, and operations or other activities in space for U.S. national interests." [248]

These policy decisions do not necessarily mean that the U.S. intends to deploy space weapons, but rather that defense leadership is seeking to maintain as many options as possible for space defense. Former President George W. Bush declared that the U.S.' continued observance of the ABM treaty would hinder the "ability to develop ways to protect the U.S. against long-range

[247] United States. 2006 Unclassified U.S. National Space Policy. 31 Aug. 2006. *Office of Science and Technology Policy*. 11 Nov. 2008 <http://www.ostp.gov/galleries/default-file/Unclassified%20National%20Space%20Policy%20-%20FINAL.pdf>.
[248] United States. 2006 Unclassified U.S. National Space Policy.

ballistic missile attacks."[249] This assertion supports the contention that the ABM treaty is outdated and that a ballistic missile strike would most likely come from a terrorist group or rogue nation. Ergo, the focus of national defense should be protection from these attacks, not attacks from established states with which the U.S. has a working relationship. Furthermore, the U.S. refusal to sign the PAROS agreement may have been due to the scope of the terms involved. The principle agreement would have made it difficult for the U.S. to maintain Ballistic Missile Defense systems (BMDs).[250]

Nonetheless, the language changes made to the 2006 National Space Policy send a message to the international community that cannot be ignored. For example, the 1996 National Space Policy used by the Clinton Administration states that:

> The United States will consider and, as appropriate, formulate policy positions on arms control and related measures governing activities in space, and will conclude agreements on such measures only if they are equitable, effectively verifiable, and enhance the security of the United States and our allies.[251]

The updated policy now reads:

> "The United States will oppose the development of new legal regimes or other restrictions that seek to prohibit or limit United States access to or use of space. Proposed arms control agreements or restrictions must not impair the rights of the United States to conduct research, development, testing, and operations or other activities in space for United States national interests.[252]

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[249] "Arms Control Experts Fault United States Withdrawal from ABM Treaty: Effective Missile Defense Deployment Still Years Away." 12 June 2002. *Arms Control Association*. 19 Nov. 2008. http://www.armscontrol.org/pressroom/2002/abmadvjune02.
[250] Zhang, Hui. "FMCT and PAROS: A Chinese Perspective." Bulletin 20 - Prevention of an Arms Race in Outer Space. *International Network of Engineers and Scientists Against Proliferation.* 19 Nov. 2008 <http://www.inesap.org/bulletin20/bul20art06.htm>.
[251] United States. 1996 Unclassified U.S. National Space Policy. 14 Sept. 1996. *Office of Science and Technology Policy*. 11 Nov. 2008. http://www.ostp.gov/galleries/default-file/Unclassified%20National%20Space%20Policy%20--%20FINAL.pdf.
[252] United States. 1996 Unclassified U.S. National Space Policy.

Both of these policies emphasize the need for the U.S. to maintain freedom of action in outer space. The latter of the two emphasizes only the U.S. interest in maintaining its own freedom to use space. There is no mention of consideration of proposed arms control agreements or allies. “National interests” are also never defined and the reader is left to ponder the scope of this policy. While U.S. leadership has a duty to maintain national security, these actions can be interpreted by foreign leaders as a blatant refusal by the U.S. to take international considerations into account in their space ventures. For this reason, the intentions of the U.S. may be called into question.

UNDERSTANDING INTERNATIONAL RELATIONSHIPS

Thus far, attention of this paper has been given only to the individual history, attitudes, intentions, and policy of the U.S. and China. While certainly valuable background for understanding and explaining the actions of states, better prediction of future policy is derived from understanding the international system in which states act. Scholars in the field are divided between two major paradigms of understanding international relations: Neo-Realism and Neo-Liberalism.[253] This section will outline the ontological assumptions of each paradigm regarding the international system and how these assumptions influence the actions of states. In addition, the perceptions each state has of itself and others in the system will be used to explain the reality policymakers must face.

Neo-Realism

Neo-Realism builds on a previous theoretical construct—Classical Realism—developed by Hans Morgenthau in *Politics Among Nations: The Struggle for Power and Peace*. Shifting from value-laden idealism, Classical Realism persuaded political researchers to evaluate power interests as the driving force of relations between states.[254]

Neo-Realism (also referred to as Structural Realism) uses much of the core Hans Morgenthau developed in Classical Realism. Like Classical Realism, Neo-Realism relies on the assumption of the international system characterized by anarchy.[255] Anarchy is not meant to imply chaos, but

[253] Baldwin, David A., ed. Neorealism and Neoliberalism : The Contemporary Debate. New York: Columbia University Press, 1993.
[254] Morgenthau, Hans J. and Kenneth W. Thompson. Politics Among Nations : The Struggle for Power and Peace. Ed. Ashbel Green. New York: Knopf, 1985.
[255] Waltz, Kenneth N. Theory of International Politics. New York: McGraw-Hill Humanities, Social Sciences & World Languages, 1979, p 89.

the lack of a central authority figure or hierarchical governing body. As a result, a state is solely dependent on itself for achieving any and all interests it may have. A second assumption of Neo-Realism identifies states as rational unitary actors. Being a rational unitary actor means a state can think and act with a single mind, concretely ordering its preferences and pursuing policy to achieve its interests.[256] Third, Neo-Realism assumes the singular primary motivation of a state is security.[257] "In anarchy, security is the highest end. Only if survival is assured can states safely seek such other goals as tranquility, profit, and power."[258] Diverging from Classical Realism, Neo-Realism views power as a means to ensure national security, not the end goal itself. Because power is a means to ensure survival, power relative to other states is more important than absolute power.

The anarchical structure of the international system can often explain the actions of states. Pressures exerted on states by international competition limit and constrain their choices, creating predictable patterns of state behavior. Due to a universal concern for national security, power balancing is common within the anarchical international system.

> Because power is a means and not an end, states prefer to join the weaker of two coalitions. They cannot let power, a possibly useful means, become the end they pursue. The goal the system encourages them to seek is security. Increased power may or may not serve that end . . . on the weaker side, they are both more appreciated and safer.[259]

Two types of balancing actions are outlined in Neo-Realism: internal and external balancing. Pursued primarily by the great powers, internal balancing is achieved by developing relative

[256] Waltz, Kenneth N. Theory of International Politics. New York: McGraw-Hill Humanities, Social Sciences & World Languages, 1979, p 89.
[257] Waltz, Kenneth N.
[258] Waltz, Kenneth N.
[259] Waltz, Kenneth N.

military power gains or economic strength. Alternatively, secondary states engage in external balancing that is achieved by entering into alliances and agreements in efforts to combine power and effectively counter the greater force. Cooperation between the great powers is nearly impossible. Only when national security interests align can states cooperate. Even then, cooperation and compromise is limited to issues inconsequential for national security. "No state intends to participate in the formation of a structure by which it and others will be constrained."[260] With national security persistently the trump card in international relationships, states are wary of agreements that limit their ability to ensure survival.

Neo-Liberalism

Scholars disenchanted with security studies saw the peaceful dissolution of the Soviet Union as the ultimate failure of Neo-Realism. In addition, increased economic cooperation resulting from globalization called into question the claims of Neo-Realist scholars. Similar to Neo-Realism, Neo-Liberalism perceives international relationships as a system in anarchy. However, Neo-Liberal scholars diverge from their Neo-Realist counterparts on a number of other ontological assumptions. Neo-Liberalism does not adhere to assumptions of the rational unitary state. Instead, states are pluralist actors experiencing multiple channels of interaction.[261] As pluralist actors, states cannot be rational because collective decision-making procedures yield varying preferences for the state. Neo-Liberals thusly assume that states experiencing multiple preference orderings do not have a clear hierarchy of interests.[262] Whereas national security is *always* the top priority for Neo-Realists, Neo-Liberals assume state interests are multiple and vary in

[260] Waltz, Kenneth N. Theory of International Politics. New York: McGraw-Hill Humanities, Social Sciences & World Languages, 1979, p 89.
[261] Keohane, Robert O. and Joseph S. Nye. Power and Interdependence. New York: Addison-Wesley Longman Limited, 2000, p 21.
[262] Keohane, Robert O. and Joseph S. Nye. p 21.

importance. To achieve this opportunity for states, Neo-Liberalism assumes states have security because force is unusable.[263] Citing the centrality of economic relationships between states, Neo-Liberals claim that complex interdependence prevents the use of force to achieve interests.[264]

Under the assumptions of Neo-Liberalism, states are likely to cooperate with one another because of shared interests. Shared interests over time allow regimes to develop in the previously anarchical international system, giving structure and patterns to international relationships. Regimes act as broad sets of understandings, rules, norms, or procedures that lead to common interests and values.[265] Interdependence is so engrained in the economies of each state; cooperation is almost inevitable because the costs of defecting are so high. Therefore, states follow the rules because it facilitates achieving individual and common interests.

Perceptions of Self and Others: China & the United States

Unfortunately, theories of international relationships only help to predict future interactions between states so much. States do not carry a business card around declaring their theoretical perception of the world. Policymakers must infer the orientation of other states while also taking into account the perception of themselves in the eyes of others. Evaluating only one of many relationships around the globe sheds light on the complexity of international relations.

As the world's fastest rising state, the PRC has repeatedly declared itself as a "cooperative, peaceful, and responsible power."[266] Concerned especially with its international image and

[263] Keohane, Robert O. and Joseph S. Nye. Power and Interdependence. New York: Addison-Wesley Longman Limited, 2000, p 21.
[264] Keohane, Robert O. and Joseph S. Nye. Power and Interdependence. New York: Addison-Wesley Longman Limited, 2000, p 22..
[265] Krasner, Stephen D. ed. International Regimes. New York: Cornell University Press, 1983.
[266] Deng, Yong. "Hegemon on the offensive: Chinese perspectives on UNITED STATES global strategy." Political Science Quarterly 116 (2001), 359.

prestige, China has taken such declarations into account in its foreign policy.[267] With specific regard to space, China professes its desire that "outer space should be for peaceful purposes and benefit the whole of mankind."[268] In addition, multiple papers have been published to the same end. In February 2008, Chinese officials declared they were "against the weaponization of or an arms race in outer space."[269] On the same day, a second position paper reflected Neo-Liberal thoughts from Chinese leaders:

> At present, countries all over the world become more and more close to each other, and their security interdependence deepens. Every country should foster a new security concept featuring mutual trust, mutual benefit, equality and coordination, so as to maintain international peace and security.[270]

Alternatively, some U.S. policymakers and intelligence officials hear Chinese words as empty rhetoric. Though Chinese leaders proclaim their intentions as "responsible," specifying what that means has not been articulated. "Clearly, China and the United States differ vastly over the meaning of international responsibility."[271] Historically, aggression against Korea, Tibet, and Taiwan (among others) gives U.S. policymakers cause for concern.[272] In the present, extensive military modernization has other security experts suspicious of Chinese declarations.[273] Additionally, assertive statements by Chinese officials such as '[American leaders] care more about Los Angeles than they do about Taiwan' or identifying the U.S. as the 'main enemy' certainly worry U.S. policymakers.[274] Perhaps the most troubling feature about China's rise for

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[267] Wang, Haihan. "The Current Situation and Future Prospect of Sino-US Relations." International Studies 12-13 (1998), 17-28.
[268] Chinese White Papers, Space. http://www.china.org.cn/e-white/8/20-1.htm.
[269] Chinese Position Paper. Prevention of an Arms Race in Outer Space. 2008/02/29. http://www.fmprc.gov.cn/eng/wjb/zzjg/jks/kjlc/wkdd/t410757.htm.
[270] Chinese Position Paper. Missile Defense. 2008/02/29. <http://www.fmprc.gov.cn/eng/wjb/zzjg/jks/kjlc/wkdd/t410755.htm>.
[271] Chen, Rosalie. "China Perceives America: Perspectives of International Relations Experts." Journal of Contemporary China 12 (2003), p 291.
[272] Broomfield, Emma V. "Perception of Danger: the China threat theory." Journal of Contemporary China 12(35) (2003) (pp. 265-284).
[273] Broomfield, Emma V.
[274] Broomfield, Emma V.

the U.S. is how economic growth has translated into extensive military modernization programs. "China should be viewed as a threat because, if nothing more, it views us as a threat and will take measures to secure itself that will ultimately threaten our own security. China has declared that the U.S. is hegemonic and a threat to its own independence and sovereignty."[275]

U.S. diplomats adamantly disagree with Chinese declarations of malevolent U.S. hegemony. Instead, the U.S. views and professes itself as a benevolent world leader. In The Tragedy of American Diplomacy, William Appleman Williams outlined the fundamental features of U.S. foreign policy. Evaluating much history and policy at the time (1959), Williams saw domestic and foreign policy as inexorably linked.[276] Once foreign policy escapes domestic forces, genuine American altruism bled through. According to Williams, Americans generally have a disinterested selfless concern for others.[277]

In the realm of space, explicit unclassified U.S. National Space Policy proclaims that "the U.S. is committed to the exploration and use of outer space by all nations for peaceful purposes, and for the benefit of all humanity."[278] Furthermore, the published policy supports the pursuit, "as appropriate, and consistent with United States national security interests, international cooperation with foreign nations and/or consortia on space activities that are of mutual benefit and that further the peaceful exploration and use of space."[279]

Despite U.S. professions of peaceful intentions, Chinese leaders and strategy analysts have "overall perceived a consistent and malign United States strategy of global domination and

[275] Broomfield, Emma V. "Perception of Danger: the China threat theory." Journal of Contemporary China 12(35) (2003) (pp. 265-284).
[276] Williams, William Appleman. The Tragedy of American Diplomacy. Boston: W.W. Norton & Company, 1988.
[277] Williams, William Appleman.
[278] United States. 2006 Unclassified U.S. National Space Policy. 31 Aug. 2006. *Office of Science and Technology Policy*. 11 Nov. 2008. http://www.ostp.gov/galleries/default-file/Unclassified%20National%20Space%20Policy%20--%20FINAL.pdf.
[279] United States. 2006 Unclassified U.S. National Space Policy.

consider United States hegemony to be predatory in nature."[280] Chinese scholars, too, generally perceive U.S. actions as part of a "coherent grand strategy of global domination."[281] The prevailing view throughout many Chinese articles concludes America's "court and commonality have reached the mainstream consensus that the United States should seek world hegemony and establish a unipolar system based on the further strengthening of America's economic and military superiority."[282] "Beijing's predilection to attribute to the United States a highly coherent global strategy bent on power expansion defines how Beijing perceives American China policy. Such a perception breeds a conspiratorial view, which in turn predisposes China to see ill intentions and sinister moves in every United States act."[283] From this perspective, language in the unclassified U.S. National Space Policy such as "the United States will . . . deny, if necessary, adversaries the use of space capabilities hostile to United States national interests"[284] signals aggressive U.S. intentions. Moreover, U.S. rejection of "any limitations on the fundamental right of the United States to operate in and acquire data from space"[285] and opposition to "the development of new legal regimes or other restrictions that seek to prohibit or limit United States access to or use of space"[286] solidify Chinese fears of "a powerful and domineering state which imposes its will on others."[287]

[280] Deng, Yong. "Hegemon on the Offensive: Chinese Perspectives on United States Global Strategy." Political Science Quarterly 116 (2001), p 244.
[281] Blum, Samantha. "Chinese Views of US Hegemony." Journal of Contemporary China 12 (2003), 242.
[282] Ding, Sheng and Qichang Lu. "Viewing American Global Strategy from the Atrocity of NATO." Contemporary International relations 9 (1999),p 2.
[283] Deng, Yong. "Hegemon on the Offensive: Chinese Perspectives on United States Global Strategy." Political Science Quarterly 116 (2001), p 244.352.
[284] United States. 2006 Unclassified U.S. National Space Policy. 31 Aug. 2006. *Office of Science and Technology Policy*. 11 Nov. 2008. http://www.ostp.gov/galleries/default-file/Unclassified%20National%20Space%20Policy%20--%20FINAL.pdf.
[285] United States. 2006 Unclassified U.S. National Space Policy.
[286] United States. 2006 Unclassified U.S. National Space Policy.
[287] Shambaugh, David. Beautiful Imperialist: China Perceives America, 1972-1990. New York: Princeton University Press, 1993. p 82.

The Reality Policymakers Face

In international relations, perception is often the reality. States act in what they perceive to be their best interest. Information is rarely complete or perfect. "Behavior [between states] is principally a function of perception."[288] "Despite continued progress, there remains a perceptual gap between the United States and China."[289] Both states identify themselves as Neo-Liberal in nature, but concurrently do not trust the words or actions of the other. "As China is on the rise and the United States wants to maintain its unipolar dominance", tension between the two states is primarily structural.[290] Neo-Realist perspectives have therefore become more dominant within the minds of policymakers in both nations.

While Neo-Liberal theorists propose that cooperation is possible within the anarchical international system, Neo-Realists reject the possibility. Especially concerned with security, Neo-Realist policymakers will not sacrifice security for pipedreams of utopian cooperation. In the realm of space, nations must be wary of falling behind in the development of the ultimate high ground. Neo-Realist theories explain the rational choices made by states to develop weapons to ensure their survival as the classic security dilemma. The security dilemma (also known as the prisoner's dilemma in psychological literature) stems from a 1951 book by John H. Herz. In his description of the security dilemma, Herz refers to what can happen when two nation-states enter a period of potential conflict. The dilemma occurs because as one country

[288] Shambaugh, David. Beautiful Imperialist: China Perceives America, 1972-1990. New York: Princeton University Press, 1993. p 3.
[289] Chen, Rosalie. "China Perceives America: Perspectives of International Relations Experts." Journal of Contemporary China 12 (2003), p 296-7.
[290] Chen, Rosalie. "China Perceives America: Perspectives of International Relations Experts." Journal of Contemporary China 12 (2003), p 290.

steps up its offensive tactics (such as the use of space weaponry), other countries will respond accordingly, creating an overall more offensive atmosphere. [291]

The table below shows preference rankings for a dyadic system of interaction between the U.S. and an adversary. A rank of 4 indicates the state's most preferred option while a 1 indicates its least preferred option. Developing space weapons is perceived to be a way to increase security, most effective when Country X does not develop its own space capabilities (lower left box). Conversely, the worst outcome would be for Country X to have space capabilities but the U.S. not (top right box). Mutual restraint from developing such capabilities is more preferred than mutual development because time and resources can be devoted to other functions (lower right box).

[291] Herz, John H. Political Realism and Political Idealism: A Study in Theories and Realities. Berkeley: University of California Press,1951.

		United States			
		Develop Space Weapons		Not Develop Space Weapons	
Country X	Develop Space Weapons		2		1
		2		4	
	Not Develop Space Weapons		4		3
		1		3	

Figure 3: Classic Security Dilemma

Neo-Realist thought is not static, but dynamic in nature. Each state must act in accordance with the knowledge that other states are acting as they are acting themselves. Thus, while mutual restraint from development yields the highest total outcome, neither state is comfortable pursuing that route because the risk of defection by the other state is disastrous. Each state has a dominant strategy to develop space weapons regardless of what the other does. From the perspective of the U.S., development is preferred to not developing whether Country X develops or does not. Country X makes the same calculation, resulting in mutual development of space capabilities. Likely, policymakers around the globe have come to this conclusion, pushing forward their own development in fear of falling behind. Strategy is all rolled into one—policymakers cannot

separate space strategy from conventional or political strategy. All are relevant when considering cooperative ventures such as treaties and international agreements.

INTERNATIONAL ACTORS

The space programs of China and the U.S. do not operate in a vacuum. To the contrary, international relationships have a huge impact on space priorities, economics, and national and international security concerns. The following analysis of relevant international relationships will serve to illustrate how much more complicated the exploration of space becomes when different authorities seek to utilize it. Further, this section will emphasize the importance of both maintaining an awareness and consideration of international relationships as a predictor of foreign actions and policies in space.

Taiwan

The U.S. involvement in the China-Taiwan relationship is the most visible and volatile issue regarding U.S.-China relations. The U.S. has an interest in both the maintenance of Taiwanese independence as well as its business relations with both countries. The competing claims of the sovereignty of China and Taiwan, and the interests of the U.S. in maintenance of the region's stability combine to produce a complex relationship.

In 1949 when Mao Zedong's Communist Party was coming to power, the existing government authority, called the Kuomintang, fled to Taiwan.[292] In 1954, the government of the U.S. and the Taiwan authorities signed a Mutual Defense Treaty, bringing about the separation of Taiwan from the mainland.[293] Despite this separation, mainland China has always considered Taiwan another province of the PRC.

[292] People's Republic of China. "Taiwan Province." 15 Nov. 2000. *Ministry of Foreign Affairs.* 23 October 2008. http://www.fmprc.gov.cn/eng/ljzg/zgjk/3572/t17813.htm.
[293] People's Republic of China.

The U.S. and Taiwan remained formal allies until 1979 when the U.S. withdrew its recognition of Taiwan as a country and withdrew from the Mutual Defense Treaty in an effort to normalize relations with China.[294] At the same time the U.S. established official diplomatic relations with China, formally recognizing the government of the PRC as the sole legitimate government of China and Taiwan as a part of China."[295] Several months after the U.S. withdrawal from the Mutual Defense Treaty, the Taiwan Relations Act was signed into law by President Carter. The act outlined the U.S.'s involvement with Taiwan despite formal recognition of the PRC and declared the expectation that the future of Taiwan would be determined peacefully.[296] More specifically, the act created the authority for unofficial relations with Taiwan, including commercial and cultural exchanges, to be conducted through the American Institute in Taiwan (AIT).[297]

Other countries have also shifted their recognition of leadership from Taipei to Beijing due to judicious offers of aid and the urgings of the Chinese government.[298] The strong economic ties the U.S. maintains with Taiwan, as well as China, give an impression of two Chinas, something to which mainland China is vehemently opposed. However, China can only protest so much as it must preserve its ties to the American market to sell its goods.[299]

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[294] Jost, Kenneth. "Taiwan, China and the US: How Will Taipei-Beijing Relations Affect the US?" 24 Mar. 1996. *Congressional Quarterly*. 29 Oct. 2008. http://library.cqpress.com.leo.lib.unomaha.edu/cqresearcher/document.php?id=cqresrre1996052400&type=hitlist&num=0.

[295] People's Republic of China. "Taiwan Province." 15 Nov. 2000. *Ministry of Foreign Affairs*. 23 October 2008. http://www.fmprc.gov.cn/eng/ljzg/zgjk/3572/t17813.htm.

[296] United States. U.S .96th Congress. "Taiwan Relations Act." 1 Jan. 1979. *American Institute in Taiwan*. 19 November 2008. http://www.ait.org.tw/en/about_ait/tra/.

[297] United States. "United States, Asia-Pacific Security Alliances." Jan. 1998. *United States Information Agency*. 19 Nov. 2008 http://usinfo.state.gov/journals/itps/0198/ijpe/pj18fact.htm.

[298] Zakaria, Fareed. The Post-American World. Boston: W. W. Norton & Company, Incorporated, 2008.

[299] Zakaria, Fareed.

Chinese policy regarding the succession of Taiwan from the mainland is, in summary, a rejection of Taiwanese claims to sovereignty on the grounds that there is only "one" China.[300] In a 2000 Chinese white paper, the key points of the One-China principle were that China would:[301]

- Do its best to achieve peaceful reunification, but will not commit itself to rule out the use of force;
- Actively promote people-to-people and economic and cultural exchanges between the two sides;
- Start direct trade, postal, air and shipping services as soon as possible;
- Achieve reunification through peaceful negotiations; and
- Negotiate any matter necessary on the premise of the One-China principle

The Chinese view of international relations with Taiwan is further expressed in the Chinese Ministry of Foreign Affairs statement that indicated that: [302]

> Any country seeking to establish diplomatic relations with China must show its readiness to sever all diplomatic relations with the Taiwan authorities and recognize the government of the PRC as the sole legal government of China. The Chinese government will never tolerate any country scheming to create 'two Chinas' or 'one China, one Taiwan'; nor will it tolerate any moves on the part of countries having formal diplomatic relations with China to establish any form of official relations with the Taiwan authorities.[303]

The U.S. has placed itself in an awkward position between Taiwan and China. Taiwan's independence from China ensures Taiwanese control of the Taiwan Strait and the South China Sea for transportation and trade. The U.S. has provided military support for the island's defense

[300] United States. "The National Security Implications of the Economic Relationship Between the United States and China." July 2002. *United States-China Economic Security Review Commission.* 29 October 2008. <http://www.uscc.gov/researchpapers/2000_2003/reports/anrp02.htm>.
[301] United States. "The National Security Implications of the Economic Relationship Between the United States and China."
[302] People's Republic of China. "Principles Governing the Establishment of Diplomatic Relations with Other Countries." 15 Nov. 2001. *Ministry of Foreign Affairs.* 29 Oct. 2008 <http://www.fmprc.gov.cn/eng/ljzg/zgjk/3575/t17826.htm>.
[303] People's Republic of China.

in the form of "…F-16s, modern military training, and modern technology…"[304] These defense articles are provided "…in such a quantity as may be necessary for Taiwan to maintain a sufficient self defense capability."[305] Further, regarding the strategic significance of the island, General Douglas MacArthur once commented that it was akin to "…an unsinkable aircraft carrier" off the coast of China.[306] In the event of an armed conflict, the use of Taiwan as a staging area would be invaluable.

Should China ever decide to use force in an attempt to re-absorb Taiwan, the U.S. will be compelled to make a definitive statement of support for one side or the other. Siding with Taiwan places the U.S. directly in opposition to China, a country with a massive population and economy to support it in the event of conflict.[307]

China is also weighing the costs of U.S. military intervention in Taiwan. China's space program is growing in part due to suspected efforts to deter the U.S. from intervening on behalf of Taiwan. "Beijing is modernizing and expanding China's military capabilities not only to keep an increasingly independent Taiwan in line, but also to effectively deny the U.S. military the ability to operate against China or its interests in Asia."[308] As developments in space continue, so does the U.S.'s reliance upon it, but "…U.S. intervention on Taiwan's side would be countered by disabling its satellites,"[309] which would deter an American military intervention in a Taiwan

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[304] Li, Zhao. "US-Taiwan Relations: Time to Change Course?" Asia Program. 05 Apr. 1999. *Woodrow Wilson International Center for Scholars*. 19 November 2008. http://www.wilsoncenter.org/index.cfm?topic_id=1462&fuseaction=topics.event_summary&event_id=3791.
[305] United States. "United States, Asia-Pacific Security Alliances." Jan. 1998. *United States Information Agency*. 19 Nov. 2008 http://usinfo.state.gov/journals/itps/0198/ijpe/pj18fact.htm.
[306] Jost, Kenneth. "Taiwan, China and the US: How Will Taipei-Beijing Relations Affect the US?" 24 Mar. 1996. *Congressional Quarterly*. 29 Oct. 2008. http://library.cqpress.com.leo.lib.unomaha.edu/cqresearcher/document.php?id=cqresrre1996052400&type=hitlist&num=0.
[307]"China Economy." *Economy Watch*.7 December 2008. < http://www.economywatch.com/world_economy/china/>.
[308] Antonellis, Robert and William S. Murray III. "China's Space Program: The Dragon Eyes the Moon (and Us)." ORBIS: A Journal of World Affairs 47 (2003): 645-652. *Foreign Policy Research Institute*. 15 September 2008. http://www.fpri.org/orbis/4704/.
[309] Dellios, Rosita. "China's Space Program: A Strategic and Political Analysis." 2005. Culture Mandala 7. *The International-Relations Portal* .15 Sept. 2008. http://www.international-relations.com/cm71wb/chinasspacewb.htm.

war.[310] China's unwavering position on the internal handling of Taiwan may be for their own sense of national security, not just maintenance of their strong national identity. In the case of a cross strait conflict in which the U.S. participates, it will be important to note that "the United States military's almost complete dependence on space assets has not escaped the close examination of Chinese analysts."[311]

Russia

With Russia's close proximity to China and its advanced space capabilities, it is no surprise that the U.S. is concerned with Russia's position as an influential actor upon, and source of information for, China. Russia and China have been deemed the U.S.' near-peer rivals.[312] The fact that they are working together to further their science and technology programs regarding space has been cause for concern for some. "In September 2005, the head of the Russian Federal Space Agency stated that cooperation with China reached a 'fundamentally new level' with 29 new projects added to the cooperation program for 2004-06."[313] From 2001-2005, Russia made 117 space launches while the U.S. made 90 launches, and China made only 26.[314] Cooperation between the two countries appears to favor China, but Russia has concerns of China's growing power. Despite its initial consideration of China, the U.S. is also apprehensive of a future reliance on Russia for access to the ISS and the effect this will have on a relationship between Russia and China.

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[310] "The Militarisation of Space: Disharmony in the Spheres." 17 Jan. 2008. The Economist. 18 September 2008. http://www.economist.com/research/articlesbysubject/printerfriendly.cfm?story_id=1053.
[311] Hagt, Eric. "China's ASAT Test: Strategic Response." 2007. China Security. *World Security Institute*. 23 September 2008. p 32. http://www.wsichina.org/cs5_3.pdf.
[312] "The Militarisation of Space: Disharmony in the spheres."
[313] Pollpeter, Kevin. "Building for the Future: China's Progress in Space Technology During the Tenth-5 Year Plan and the United States Response." 2008. U.S. Army War College. *Strategic Studies Institute*. 28 October 2008. p 15. http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?PubID=852.
[314] Pollpeter, Kevin.

Russia and China have worked together in the sharing of technology, arms deals, and advocating a United Nations treaty. However, this relationship exists only while it is beneficial for both parties. “Russian enterprises have provided high-grade steel, wind tunnel test facilities for flight performance, and special alloys for the missile casing and for foil shielding around guidance systems and above all else education in the rocket related sciences.”[315] Along with this provision “Russia’s Mashinostroyeniye Science and Production Association’s 1-to-3- meter-resolution optical/radar system”[316] is available on the open market. This technology makes it clear that “the United States is entering a new era of transparency that will affect areas ranging from military operations to public diplomacy.”[317] Due to the nature of U.S.-China relations, this information could prove disastrous in the hands of the Chinese.

China has also acquired GPS jamming technology on the open market that is designed to deny GPS-guided weapons guidance signals, as well as ASAT programs reportedly from old Soviet technology.[318] A variety of technical documents the Chinese have included:

> … everything from old co-orbital ASAT systems, to laser blinders, to parasitic microsatellites. All of these are technically feasible, and they represent only a portion of the range of options open to an adversary seeking to cut the chain of data derived and transmitted through space. Given the importance of space systems to the national information infrastructure, their protection is far more than a strictly military requirement.[319]

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[315] Vick, Charles P. "Missile Technology Transfer from Russia & China to Iran." 03 Apr. 2007. Global Security. 03 Apr. 2007. 03 Oct. 08. http://globalsecurity.org.
[316] Randolph, Stephen P. "Controlling Space." Transforming America's Military. Etd. Hans Binnendijk. Washington, D.C.: National Defense University Press, 2001. 15 Sept. 2008. <http://www.au.af.mil/au/awc/awcgate/ndu/tam/14_ch12.htm>.
[263] Randolph, Stephen P.
[318] Randolph, Stephen P.
[319] Masci, David. "The Future of United States-Russia Relations." CQ Researcher 12 (2002): 25-48. 01 Oct. 2008. p 29. http://www.cqpress.com/product/researcher-the-future-of-us-russia.html.

In addition to the sharing of information amongst each other, Russia and China have engaged in arms deals with Iran. "They've [Russia] been selling advanced weapons technology to China and Iraq, as well as nuclear material to countries like Iran."[320] "A Chinese company, Great Wall Industries, is reportedly supplying missile-testing telemetry technology to Iran. Others are known to have provided solid motor technology requested by Iran."[321] With similar arms deals originating from Russia and China, it is questionable whether there is regional influence exerted to promote such deals.

Russia and China may be cooperating in such deals to hedge against growing U.S.-European Union (EU) relations. This becomes apparent in the PAROS treaty advocated by both Russia and China. "Partnering with Russia, China calls for confidence-building measures in outer space, dialogue on appropriate actions in outer space, and, ultimately, the negotiation of an international treaty designed to prevent an arms race in outer space."[322] Despite the joint promotion of PAROS, the U.S. and Russia should be cautious of China. According to Dr. Maorong Jiang, a professor at Creighton University and former officer of the PLA, the U.S. should not buy China's signature on treaties because they will change their position whenever it's accommodating for them due to China's flexible policy-making.[323]

It is stated in China's foreign policy that it "shall not form alliances with any major power or group of nations."[324] Due to this clearly stated policy, Russia and China do not operate as allies, more like business partners. Each engages with the other only while it is beneficial to them. An

[320] Masci, David. "The Future of United States-Russia Relations." CQ Researcher 12 (2002): 25-48. 01 Oct. 2008. p 29. http://www.cqpress.com/product/researcher-the-future-of-us-russia.html.
[321] Vick, Charles P. "Missile Technology Transfer from Russia & China to Iran." 03 Apr. 2007. Global Security. 03 Apr. 2007. 03 Oct. 08. http://globalsecurity.org.
[322] Blazejewski, Kenneth S. "Space Weaponization and US-China Relations." 2008. Strategic Studies Quarterly. *Air University*. 23 Oct. 2008. p 37. <http://www.au.af.mil/au/ssq/2008/spring/blazejewski.pdf>.
[323] Jiang, Dr. Maorong. Lecture. Creighton University, Omaha. 26 Sept. 2008.
[324] People's Republic of China. "Foreign Policy." 15 Nov. 2000. *Ministry of Foreign Affairs*. 23 Oct. 2008 http://www.fmprc.gov.cn/eng/ljzg/zgjk/3575/t17825.htm.

example is China's desire to acquire the design of the Russian escape capsule. The PRC wanted to buy the design from the Russians, but found that it was too expensive; instead, China took reconnaissance pictures of escape capsule production and reverse-engineered its own version from the photos.[325] "While the Chinese currently depend on Russian space technology, the country is working to grow its own capabilities."[326] Russia also continues to further develop its own goals. According to the Center for Security Policy, "Russia hasn't changed dramatically but is simply doing what it always does: pursuing its interests."[327] To demonstrate, Russia and China are both pursuing their own circumlunar navigation programs. "…Russia could accomplish a human lunar circumnavigation flight by 2008 through 2010 and a human lunar landing as early as 2012, and China is expected to do an un-crewed lunar circumnavigation flight as early as 2012 but more likely a human lunar circumnavigation/orbital flight by 2014-2015 time frame at the latest."[328]

Russia's reluctance to work with China on its circumlunar navigation program shows that it does have some concerns with China. Even though China's space capabilities haven't rivaled Russian and American capabilities since the 1960s,[329] Russia is still fearful of the PRC's quick advancement in the space sector. China is seen as "challenging the U.S. predominance on the world's stage because it is their belief doctrinally that the U.S. is on the decline as a world power that can and will be replaced by China…"[330] According to Charles Vick, an expert in Soviet

[325] Jones, Dr. Morris. Telephone Interview. 01 Oct. 2008.
[326] United States. "Official Cites Uncertainty Over Chinese Space Intentions." 21 May 2008. American Forces Press Services. Jim. Garamore. *Department of Defense*. 15 Sept. 2008. http://www.defenselink.mil/news/newsarticle.aspx?id=49958.
[327] Masci, David. "The Future of United States-Russia Relations." CQ Researcher 12 (2002): 25-48. 01 Oct. 2008. p 30. http://www.cqpress.com/product/researcher-the-future-of-us-russia.html.
[328] Vick, Charles P. "China and Russia Challenging the Space Leadership of the United States." 21 Apr. 2006. Global Security. 3 Oct. 2008 <http://globalsecurity.org>.
[329] Vick, Charles P.
[330] Vick, Charles P.

space technology, Russia will not settle for being third to any nation.[331] Russia's apprehension also stems from being compelled to join the "Shanghai Cooperation Organization, which was a Chinese initiative, to avoid surrendering political leadership and military influence in Central Asia to China."[332]

But Russia is also concerned with the U.S. "Some Russian elites are paranoid that the West never intended to engage and integrate Russia into the global arena. Rather, the West always sought to dismantle and exploit Russia. In this mind-set, every new milestone in U.S. and EU relations with states on Russia's periphery was (and is) assessed as a move to undermine Russia."[333] This fear, coupled with China's desire to challenge the U.S. on the world's stage, shows the need the two countries feel to work together. "Russia and China have to some extent a shared interest in reducing U.S. influence in the area."[334] It appears that "…they both seek to fashion a multi-polar world to balance the United States."[335]

Alternatively, the U.S. has concerns regarding a Russia-China relationship pertaining mostly to the ISS. In 2010, the U.S. has planned to discontinue use of its space shuttle(s) until a new, improved shuttle can be created between 2015 and 2020. During this period the U.S. will not have access to the ISS unless it buys rides from Russia. Considering the relationship between Russia and China, as well as the fact that the U.S. has thus far opposed China joining the ISS, the cooperation of the U.S. and Russia to get to the ISS could result in tension among all three states. "There is no way the United States is going to consider much less permit China to be a part of

[331] Vick, Charles P. "China and Russia Challenging the Space Leadership of the United States."
[332] Deane, Dr. Michael J. and Margaret A. Harlow. "Russia Workshop: Strategic Assessments Country Workshop Series." 10 May 2007. *National Security Analysis Department: Johns Hopkins University*. p 16.
[333] Deane, Dr. Michael J., and Margaret A. Harlow. p 15.
[334] Deane, Dr. Michael J., and Margaret A. Harlow. p 10.
[335] Deane, Dr. Michael J., and Margaret A. Harlow. p 16.

the ISS program as long as it continues to violate the Missile Technology Control Regime…To do otherwise would undermine the U.S. position and capabilities."[336]

China, as a result of its denial to join the ISS, has embarked on a plan to create their own space station:

> The Russians…have clearly indicated that China will seek a separate space station program of their own in spite of the high economic cost that has given the Chinese leadership some pause. According to the Chinese forecast planning it is scheduled to appear in rudimentary form some time in the years 2009-2010 or the beginning of the following five year plan starting on January 1, 2011 and it will be completely independent of the ISS.[337]

The development of a Chinese space station would likely be a contributing factor to a space war. The Chinese are acting in opposition to, and in spite of, the U.S. with help from the Russians. As space capabilities develop, it will be important for the U.S. to look towards Russia to see where China is headed.

Japan

Japan's space program is wrought with a history of launch failures, budget cuts, and low public approval. Japan's launch failures begin in 1966 with four failed attempts by the Institute for Space and Astronautical Science (ISAS) to launch Japan's first satellite.[338] In 1969, Japan and the U.S. signed an agreement for the transfer of unclassified technology that prohibited any re-

[336] Vick, Charles P. "China and Russia Challenging the Space Leadership of the United States." 21 Apr. 2006. Global Security. 3 Oct. 2008 <http://globalsecurity.org>.
[337] Vick, Charles P.
[338] Berner, Steven. "Japan's Space Program: A Fork in the Road?" *RAND: National Security Research Division* (2005): 1-43. 01 Oct. 2008. http://www.rand.org/pubs/technical_reports/2005/rand_tr184.pdf.

exporting of this technology.[339] Following this agreement Japan was able to launch its first satellite.

Shortly after Japan's series of failures, Japan was able to successfully develop the Japanese Experiment Module (JEM) for the ISS.[340] During this same period Japan's satellite reconnaissance program began.

In October 2003, Japan's space program was consolidated into the Japan Aerospace Exploration Agency (JAXA).[341] After this consolidation, JAXA furthered plans to develop and deploy a military/intelligence reconnaissance system.[342] This increase in development may be due to a "growing willingness to begin assuming a greater military role in the region"[343] in response to China's advancements in space.

Even with increased technology and capabilities, it is unlikely Japan's space program will be able to achieve all of its goals. This is due to the lack of a strong budget for JAXA. The National Space Development Agency's (NASDA) budget is severely restricted compared to other countries programs. It is "roughly one-tenth that of NASA, and about one-third that of the European Space Agency (ESA)."[344]

The lack of an adequate budget may be the result of low public support of Japan's space program. "In a 1997 survey by the National Institute of Science and Technology Policy of the Science and Technology Agency, fourteen areas [in Japan] were surveyed to assess the degree of importance attached to them. Space had the next to lowest rating, exceeding only urbanization

[339] Berner, Steven. "Japan's Space Program: A Fork in the Road?" *RAND: National Security Research Division* (2005): 1-43. 01 Oct. 2008. http://www.rand.org/pubs/technical_reports/2005/rand_tr184.pdf.
[340] Berner, Steven.
[341] Berner, Steven.
[342] Berner, Steven.
[343] Berner, Steven.
[344] Berner, Steven.

and construction."[345] The Japanese people, seeing only the launch failures, cannot comprehend how a space program would produce major economic benefits.[346]

Considering these setbacks, one might wonder why Japan continues to pursue such feats in space. It seems to be more of a symbolic effort than real determination to dominate, or be competitive, in space. As a regional power, it is important for Japan to show its people that it will not be overshadowed by the growing Chinese influence. When asked about the purpose of the space program, "JAXA officials noted that space gives dreams and hope to the public."[347] Japan may also be pursuing a space program to show that it is still a world power and can compete on the international stage. It was able to create the JEM for the ISS, but still had trouble creating successful launch vehicles.

Despite the appearance of a struggling space program, several countries are concerned on the direction Japan is heading. Some consider Japan to be allied with the U.S. for the purpose of containing China.[348] An alliance between the U.S. and Japan is beneficial to the U.S. and for establishing stability in the region. While China is not kept out of regional relationships, it is skeptical of the association between the two countries and what may be motivating it. Indonesia has also expressed concerns that Japan's role in a missile defense system could lead to a regional arms race.[349]

Alternatively, Japan is concerned with China's future intentions with its advancing space capabilities. The buildup of Chinese space power has resulted in a concerned Japan that is

[345] Berner, Steven. "Japan's Space Program: A Fork in the Road?" *RAND: National Security Research Division* (2005): 1-43. 01 Oct. 2008. http://www.rand.org/pubs/technical_reports/2005/rand_tr184.pdf.
[346] Berner, Steven.
[347] Berner, Steven.
[348] Wortzel, Larry M. "The Chinese People's Liberation Army and Space Warfare." 2007. American Enterprise Institute for Public Policy Research. 29 September 2009. p 1-20. http://www.aei.org/publications/pubid.26977/pub_detail.asp.
[349] Berner, Steven.

fueling a somewhat unpopular space program with an insufficient budget. Considering the trilateral relationship between the U.S., Japan, and China, Japan doesn't want to be caught on its heels with the other two on their toes. Each perceives the possible threat level the other can achieve and, realistically, will do what it takes to prevent being overpowered, which could escalate into a space arms race.

While Japan's space program appears to be lacking, it is not one to ignore. Because of regional implications, any move Japan makes regarding space will be watched by both the U.S. and China. In this sense, Japan has great power regarding space; it simply depends on how they use it.

India

Recently, India has been augmenting its space capabilities and is emerging as the second space power in Asia. This growth in power has attracted the attention of the PRC as well as the U.S. India is also concerned with the space programs of the U.S. and the PRC, and this concern may have been a factor in India's pursuance of a stronger and more competitive space program.

India's space program is completely encompassed within the Indian Space Research Organization (ISRO), which was set up under the Atomic Energy Cooperation (AEC) in 1969.[350] The program was first created as a way to address the needs in the country, including commercial procurement and self-reliance to maximize space's benefits without hindrance.[351] Recently, India has been focused on launch vehicle and satellite technology leading to a manned

[350] Logsdon, John M., and James Clay Moltz (Eds)."Collective Security in Space: Asian Perspectives." George Washington University: Elliott School of International Affairs Space Policy Institute (2008). p 127. http://www.gwu.edu/~spi/Collective%20Security%20in%20Space%20-%20Asian%20Perspectives%20-%20January%202008.pdf.
[351] Logsdon, John M., and James Clay Moltz.

space flight with a budget of USD$700 million and manpower of 16,500 personnel.[352] In November 2008, India successfully completed its 2003 plan to launch a satellite, the Chandrayan-1, to the moon.[353] The Chandrayan-1 carried payloads from the U.S. and Germany, Britain, Sweden and Bulgaria, all of with whom India plans to share the Moon data.[354] Accomplishing this task was as much a matter of prestige for the country as it was for China and Japan, who previously sent spacecraft to orbit the moon.

The Indian space policy is aimed towards peaceful research, use, and preservation of space, and cooperation to keep space free of weapons.[355] Nonetheless, India has its individual goals and has expressed interest in pursuing many of the same aspects of space technology and development of the U.S. "…[T]he militarization of space has become a reality…At the same time it is also in the Indian national interest to preserve some room as India moves forward."[356]

India seems to be interested in the peaceful development of space while taking measures to ensure its national security should the need arise to defend themselves in space. This development of protective capabilities may be influenced by the U.S. refusal to sign non-proliferation treaties and its continual development of space capabilities. India is in a strategically important position; it is within close proximity to China and stands as a growing competitor to the country. While this remains a peaceful relationship, it could quickly become a threatening one. For example, China has been selling its space technology to Pakistan. In Asia, the polarity of the region rests with China and India. Pakistan and India have a history of conflict

[352] Logsdon, John M., and James Clay Moltz (Eds)."Collective Security in Space: Asian Perspectives." George Washington University: Elliott School of International Affairs Space Policy Institute (2008). p 127. http://www.gwu.edu/~spi/Collective%20Security%20in%20Space%20-%20Asian%20Perspectives%20-%20January%202008.pdf.
[353] Logsdon, John M., and James (Clay) Moltz.
[354] "India's Flag is on the Moon." 2008. India in Space. *Space Today Online*. 20 November 2008. http://www.spacetoday.org/India/IndiaMoonFlights.html.
[355] Logsdon, John M., and James Clay Moltz.
[356] Logsdon, John M., and James Clay Moltz.

along their shared border. If China is cooperating with Pakistan, and India and Pakistan are conflicting, the U.S. is likely to support India, leading to a much larger conflict between not just Pakistan and India, but the U.S. and China. In this scenario a space arms race is likely to ensue, considering that India, the U.S., China, and now possibly Pakistan have space weapons and the capability to continually develop more advanced space capabilities.[357]

India has successfully developed its space program amid the ever increasing powers of other programs. Its goal is to be prominent and have a voice in international space development. Though the country is less developed than the main space powers, its strengthening capabilities and prominence have shown that India is catching up, and may soon influence the direction of international space development and relations among the major powers.

Brazil

While often overlooked by space scholars, Brazil is one of ten countries that is "seriously involved in using space assets for military purposes."[358] In 1995, Brazil became a member of the Missile Technology Control Regime (MTCR), which is discussed later in the paper. Despite Brazil's entrance into the MTCR, concerns continue regarding its missile exports and programs and the military's role in the Brazilian space program. In response, Brazil separated its space program from the Brazilian Commission for Space Activities and created the Brazilian Space

[357] Abbasi, Rizwana. "India in Outer Space: Emerging Concerns." 29 Jan. 2008. Counter Currents. 23 Oct. 2008. http://www.countercurrents.org/abbasi290108.htm.
[358] Hitchens, Theresa."US Space Policy: Time to Stop and Think." 2002. Disarmament Diplomacy. 30 September 2008. http://www.acronym.org.uk/dd/dd67/67op2.htm.

Agency (BSA). While semantically both agencies might seem synonymous, the BSA is a civilian agency. [359] According to the "National Program of Space Activities: 2005-2014," Brazil plans to:

> …focus its near-term activities in space on 'earth observation, technological and scientific missions, telecommunications and meteorology' to aid the development of Brazil's society and industry…the BSA also encourages cooperation with foreign space programs as a way to share the financial burden of space activities and enhance the technological base and expertise of Brazil's space program.[360]

In 1997, the BSA and NASA signed an agreement where Brazil would supply parts for the ISS to NASA and gain access to the ISS in return. This heralded a new era of space cooperation for Brazil. Unfortunately, Brazil's space endeavors faced a major setback in 2003 when 22 people died in an accident involving a satellite launching vehicle. The Alcantara launch pad was also destroyed.[361] Despite such setbacks, Brazil continues to pursue collaborative projects. According to the China Academy of Space Technology, China and Brazil began the China-Brazil Earth Resource Satellite (CBERS) project in 1986, which involved the development and launch of two remote-sensing satellites. The project involved both joint financing (70% by China; 30% by Brazil) and joint technological progress (i.e., China's responsibilities included the satellite system concept and the first tests of the CBERS, while Brazil developed the power and structural subsystems).[362] The collaboration was a success, as the launched satellite exceeded its expected lifetime and took more than 230,000 satellite data pictures.[363] In fact, it was so successful that Brazil and China quickly agreed to collaborate on CBERS-2, CBERS-3, and CBERS-4. In

[359] Brazil: Military Programs, accessed at http://cns.miis.edu/research/space/brazil/mil.htm (citing "Space Agency Head On US Proliferation Concerns, MTCR," Nuclear and Missile Database, Nuclear Threat Initiative website, http://www.nti.org/db/missile/1994/m9404558.htm.)
[360] "Brazil." Secure World Foundation. 01 July 2008. 31 Oct. 2008 <http://www.secureworldfoundation.org/index.php?id=77&page=brazil>.
[361] Aecio Amado. "After Tragedy, Brazil Restarts Space Program in 2007 with Ukraine's Help." Agencia Brasil. (Feb. 8, 2006). http://www.brazzilmag.com/content/view/5492/52/.
[362] China Academy of Space Technology. China-Brazil Earth Resource Satellite. http://www.cast.cn/CastEn/Show.asp?ArticleID=17408.
[363] China Academy of Space Technology.

October 2008, CBERS began its fifth year in orbit, exceeding its expected lifetime. Although China and Brazil expected to launch CBERS-3 in 2008, CBERS-3 will not likely be ready before 2011.[364] Instead, the countries built CBERS-2B (a clone of CBERS-2 launched in 2007) to fill in a gap in data continuity between CBERS-2 and CBERS-3.[365]

Brazil's space cooperation does not focus only on China. Brazil expects aid from Russia as it develops its Geostationary Satellite and has made an agreement with the Russian Space Agency to develop a new family of five satellite launchers with the first, Alpha, set to launch in 2009. Brazil also openly negotiates with the ESA on its global navigation satellite system, Galileo. Brazil's space aspirations bring a nationalistic sense of pride similar to that experienced by China. For example, Brazilian Minister of Science and Technology, Sergio Rezende, said in 2006, "Brazilians will feel pride when they see one of their countrymen soar to the space station."[366] This was achieved on March 30, 2006 when Lieutenant-Colonel Marcos Pontes was launched into space from the Baikonur launch facility in Kazakhstan on a Russian Soyuz rocket.[367]

Like many countries, Brazil claims its intentions in space are peaceful and for the purpose of advancing of its society. While this may be true, Brazil does have the capability to be competitive militarily in space. This coupled with the nationalistic pride invoked from a successful space program proves Brazil is no longer a country operating under the radar. Instead, continued cooperation may prove beneficial for both the U.S. and Brazil, leading to maintained relations and the ability to keep a watchful eye on the country.

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[364] Asian Surveying and Mapping. CBERS-2 Celebrates 5th Anniversary. http://www.asmmag.com/news/cbers-2-celebrates-5th-anniversary.
[365] Asian Surveying and Mapping.
[366] Aecio Amado. "After Tragedy, Brazil Restarts Space Program in 2007 with Ukraine's Help." Agencia Brasil. (Feb. 8, 2006). Accessed at http://www.brazzilmag.com/content/view/5492/52/.
[367] "Brazil." Secure World Foundation. 01 July 2008. 31 Oct. 2008 <http://www.secureworldfoundation.org/index.php?id=77&page=brazil>.

ESA

The European Space Agency (ESA) is often overlooked because of its non-threatening relationship with the U.S., but its accomplishments and goals should be noted. The ESA was formed in 1975 by merging the European Space Research Organization (ESRO) with the European Launcher Development Organization (ELDO).[368] Its goals were to promote scientific research and technology among its member states, which, with the recent addition of the Czech Republic, number at eighteen.

The ESA grew out of the efforts of Pierre Auger and Edoardo Amaldi after WWII commenced.[369] After merging two agencies to create a joint European organization, the ESA prospered in space domestically and internationally. While the ESA maintains good relations with the U.S., it has realized the need to expand its capabilities in space to be competitive as a global space agency. Because the U.S. and ESA work with many of the same international space agencies, the U.S. could benefit from the maintenance of good relations with the ESA and possibly enhance a more positive image of its space endeavors through such cooperation.

The ESA's rocket launches began with the development of the Ariane rocket. In 1980, the French company Arianspace was created to "produce, operate and market the Ariane 5 rocket as part of ESA's Ariane programme", which, from 1984 onward took mostly commercial payloads into orbit.[370] In 2003, the first fully European mission was achieved with the Mars Express

[368] "European Space Agency." 2008. MSN Encarta. 4 December 2008. http://encarta.msn.com/text_761557020_0/european_space_agency.html.
[369] European Space Agency."History of the European Space Agency." 14 Nov. 2008. ESA. 4 December 2008. http://www.esa.int/specials/about_esa/sem7vfevl2f_0.html.
[370] European Space Agency."History of the European Space Agency."

orbiter and its lander, Beagle 2. This mission is part of an exploration program spanning the next two decades.[371]

The ESA's most recent venture is its global navigation satellite system, Galileo. This system will work with the U.S. GPS and the Russian Space Agency's Global Orbiting Navigation Satellite System (GLONASS). It is projected that by 2010 all of the 30 satellites that comprise the system will be launched.[372]

In addition to being an international organization, the ESA engages in space endeavors with other countries including the U.S., Canada, Japan, and Brazil. It realizes the benefits to be gained from working with, and learning from, other space agencies' programs. For example, NASA's failure to reach some of its declared goals and stay within the budget for the shuttle program provided the ESA with the opportunity to learn to control costs and manage large projects under efficient means.[373] The ESA has recognized that "space is a strategic asset and that it is of fundamental importance for the independence, security and prosperity of Europe."[374] At the conclusion of a recent Council meeting of the Ministers of the ESA, the ministers concluded they had:

> …seized the opportunity to capitalize on the recent successes and achievements of Europe in space and to translate the political impetus into new programmes able to deliver knowledge, services and competitiveness and to shape ESA to assert

[371] European Space Agency."History of the European Space Agency." 14 Nov. 2008. ESA. 4 December 2008. http://www.esa.int/specials/about_esa/sem7vfevl2f_0.html.
[372] "European Global Positioning Satellites: Galileo Navigation Satellites." 2006. Space Today Online. 4 December 2008 http://www.spacetoday.org/Satellites/GalileoEuroNavSat.html.
[373] Atkins, William. "ESA Agrees to Spend US $12.8 Billion on Future Space Missions." 30 Nov. 2008 ITWire. 4 Dec. 2008. http://http://www.itwire.com/content/view/21986/1066/1/2/.
[374] European Space Agency. "European Ministers Inject New Impetus to Ensure Space's Role as a Key Asset in Facing Global Challenges." 26 Nov. 2008. ESA News. 4 December 2008. http://www.esa.int/esaCP/Pr_47_2008_p_EN.html.

itself as a global space agency, indispensible to the world in contributing to global policies.[375]

International Considerations

Through an examination of these countries and their space programs, it is apparent that space, if not regulated, has the potential to become a new battleground. To avert a conflict in space, the U.S. must take measures to communicate and cooperate with each space-faring country to prevent and preempt the threat of an attack. This could be achieved through joint ventures in space, such as the ISS. Russia, Japan, Brazil, and the ESA already cooperate on the ISS. Russia maintains its own module on the ISS that the U.S. can lease room from in order to carry out experiments. Japan has developed the JEM for the ISS and works peacefully with the U.S. Brazil exchanges technology for access to the station with the U.S. Although this is a peaceful relationship, it has the capability to become more competitive. Therefore, it is in the best interest of the U.S. to continue this exchange with Brazil in order to stay abreast of their developments and intentions. The ESA cooperates on the ISS and has good relations with the U.S. It is also in the best interest of the U.S. to maintain these relations, especially with the development of their Galileo system.

China and India are not current members of the ISS. India is growing in power and desires a greater voice in space. Allowing India to join the ISS would provide this and give the U.S. and other countries greater insight into its capabilities and direction it intends to focus its space program. However, allowing China to join the ISS remains a controversial issue. Those who argue against China participating in the joint venture believe that even if China does participate,

[375] European Space Agency. "European Ministers Inject New Impetus to Ensure Space's Role as a Key Asset in Facing Global Challenges."

little effort will be made to improve transparency of future space intentions. Additionally, an invitation to join the ISS could be seen as tacit approval from the U.S. of China's power and show that the U.S. now considers China to be an equal. Finally, detractors believe that if China joins, it may operate a separate module, similar to Russia. However, allowing China to participate in this joint endeavor in space would provide more opportunities for collaboration and give the U.S. increased ability to monitor China's activities and intentions in space.

Operating jointly on a venture like the ISS would provide incentive for all states involved to avoid space warfare. This does not include development apart from the ISS, but a joint project would be a collaborative effort that would hold those involved accountable for hostile actions taken outside the ISS.

TREATIES AND INTERNATIONAL AGREEMENTS

Examining the members of a given international treaty, and understanding the intent of that treaty are crucial to evaluating the intentions of, and restrictions on, a state. There are a number of treaties, institutions, and agreements in the international realm that seek to address many facets of space. It is important to consider the implications of a state's signature on a treaty or agreement, because it denotes a legal commitment to uphold the ideals of the treaty in both domestic affairs and international relations. Additionally, it is essential for the purposes of this research to examine international treaties and agreements that address arms transfers and non-proliferation, as they can be applicable to space weapons or counterspace capabilities.

The purpose of creating international treaties for different aspects of space, such as the use of planets and the protection of astronauts, was to essentially establish rules that would keep states safe in space:

> The rules that currently govern the use of space were codified in the 1967 Outer Space Treaty less than a decade after the first satellites were flown. They were designed to protect the common interest of all societies while regulating the competition for military advantage that dominated the pioneering programs of the United States and the Soviet Union.[376]

United Nations Treaties and Principles on Space Law

The Committee on the Peaceful Uses of Outer Space is the only international forum whose specific purpose is the development of international space law. There are five international legal

[376] Gallagher, Nancy and John D. Steinbruner. "Reconsidering the Rules for Space Security". *American Academy of Arts and Sciences*. (2008).Foreward: v.

instruments and five guiding legal principles that have been established through the Committee to govern space-related activities.

The five treaties are:[377]

- Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (referred to as the Outer Space Treaty, and entered into force 10 October 1967).
- Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (referred to as Rescue Agreement, and entered into force 22 April 1968).
- Convention on International Liability for Damage Caused by Space Objects (referred to as Liability Convention, and entered into force 1 September 1972).
- Convention on Registration of Objects Launched into Outer Space (referred to as Registration Convention and entered into force on 15 September 1976).
- Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (referred to as Moon Agreement, and entered into force 11 July 1984).

The five declarations and legal principles are:[378]

- Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space.
- Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting.

[377] United Nations. "United Nations Treaties and Principles on Outer Space." New York : 2002. 5 October 2008. p v-vi. http://www.unoosa.org/pdf/publications/STSPACE11E.pdf
[378] United Nations. "United Nations Treaties and Principles on Outer Space."

- Principles Relating to Remote Sensing of Earth from Outer Space.
- Principles Relevant to the Use of Nuclear Power Sources in Outer Space.
- Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries.

These treaties and principles are the *only* legal international rules that directly define activity in space, and the only norms that may hold nation-states accountable. Therefore they are especially important to understand, relative to U.S. and Chinese interactions in space and with each other. They reveal both the restrictions imposed on nation-states and problems that have not yet been addressed by the international community, such as technical terminology and arms races.

The 1967 Outer Space Treaty

Completed in 1967, the Outer Space Treaty (OST) still remains the backbone of international outer space relations. Many argue that despite its origin in less technologically-complex times, its framework extends so effectively to modern day occurrences that new measures should focus upon clarifying the terms of the OST rather than building a new treaty and new set of international space guidelines.

Much of the OST contains boiler plate language speaking to the peaceful use of space. This focus upon peaceful collaboration among all nations is best described in Article I:

> The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries,

> irrespective of their degree of economic or scientific development, and shall be the province of all mankind.[379]

Inherent in the OST is the ideal of cooperation and perceiving space ventures as beneficial to all of mankind and not just the astronaut's country of origin. Although the OST explicitly states that the "moon and other celestial bodies shall be used exclusively for peaceful purposes," the ASAT tests are not prohibited in the OST. Still, its attempts at creating a collaborative space environment in the last 40 years prove its success as an international space agreement and lend credence to the fact that a new U.S.-China or international sense of cooperation can emerge.

Accordingly, when a December 2000 UN General Assembly resolution sought to re-affirm the value and tenets of the OST, it passed by a vote of 163-0. The U.S. abstained from voting.[380]

Rescue Agreement

This treaty is an elaboration of aspects of Articles V and VII of the Outer Space Treaty,[381] emphasizing the importance of protecting humans in outer space. It declares that states shall take all possible steps to rescue and assist astronauts in distress, that such astronauts will be promptly returned to the launching state, and that upon request, states will provide assistance to launching states in recovering space objects. The treaty reiterates the importance of international cooperation, respect for human life, and transparency in actions that are valued in the United Nations. [382] It is important to consider that space warfare and debris from space warfare may

[379] United Nations. "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies."(1967) 3 October 2008. http://www.state.gov/t/ac/trt/5181.html.
[380] Clary, Christopher and Michael Krepon. "Space Assurance or Space Dominance? The Case Against Weaponizing Space." 2003. The Henry L. Stimson Center. 26 October 2008. http://www.stimson.org/pub.cfm?ID=81.
[381] United Nations. "Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched in Space."(1968). 16 October 2008. http://www.unoosa.org/oosa/SpaceLaw/gares/html/gares_22_2345.html
[382] United Nations. "Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched in Space."

disturb the safety of humans during manned space missions and the protected return of space assets to states.

Liability Convention

Entered into enforcement in 1972, the Convention on International Liability for Damage Caused by Space Objects expands on Article VII of the Outer Space Treaty.[383] The Liability Convention insists that states who launch objects into space are completely responsible and liable to pay compensation for any damage caused by its space objects on the earth's surface, aircraft, or in space. Further, the treaty outlines the settlement claim procedures that countries must follow in the event of damage caused. Relevant to space warfare, the treaty states that all liability is included under harm from space objects and that "no exoneration whatever shall be granted in cases where the damage has resulted from activities conducted by a launching State which are not in conformity with international law." Therefore, damage inflicted by or from space objects' counterspace capabilities or space warfare are still subject to the Liability Convention.

Registration Convention

To foster international responsibility and accountability of national activities in outer space, the Registration Convention established a central registrar of objects launched into space. Article IV of the Registration Convention states that information provided to the space object registry shall include the name of launching state, a designator or registration number, the date and location of the launch, basic orbital parameters (nodal period, inclination, apogee, and perigee), and general

[383] United Nations. "Convention on International Liability for Damage Caused by Space Objects."(1972). 14 October 2008. http://www.unoosa.org/oosa/SpaceLaw/gares/html/gares_26_2777.html.

function of the space object.[384] The treaty encourages transparency of all states in outer space and also facilitates the protection of space objects. It is important for counterspace capabilities because under this treaty, dual-use technology and space weapons launched into orbit are still applicable.

Moon Agreement

Article IV of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies states that "the exploration and use of the moon shall be the province of all mankind and shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development."[385] This treaty emphasizes the importance of peaceful international access to outer space, particularly with new scientific developments on the moon and other celestial bodies. Further, the agreement stipulates that should a body in space demonstrate exploitable resources, an international regime will be necessary to regulate the exploitation. While this treaty primarily pertains to eliminating the colonization of space, it demonstrates the importance of unlimited access to space and joint collaboration in scientific endeavors.[386]

UN Treaty Membership Status of United States, China, and Russia

The five international treaties discussed above are open to signature and ratification by Member States of the United Nations. States may follow the guidance of the treaties and principles

[384] United Nations. "Convention on Registration of Objects launched into Outerspace." (1976). 18 October 2008. http://www.unoosa.org/oosa/en/SORegister/regist.html
[385] United Nations. "Agreement Governing the Activities of States on the Moon and Other Celestial Bodies." (1979) 18 October 2008. http://www.unoosa.org/oosa/SpaceLaw/gares/html/gares_34_0068.html.
[386] United Nations.

regardless of whether or not they are signatories. However, the provisions of the treaties are only binding on the states which have ratified them. To better understand the international positions of China, the U.S., and even Russia on many space related issues, it is important to pinpoint their status' in these five UN treaties. Their membership or lack thereof, offers insight into which treaties the state wants to be legally binding in their affairs.

Chinese Status on Five Treaties

China is a party member to the first four out of the five treaties of UNOOSA. They have acceded, or agreed, to the treaties without signing them. Despite accession to the first four treaties, China has neither acceded to nor signed the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, making it a non-party member.[387]

Russian Federation's Status on Five Treaties

Russia has both signed and ratified the first four treaties, and has not acceded to the fifth treaty, Agreement Governing the Activities of States on the Moon, making it a non-party member.[388]

United States of America's Status on Five Treaties

The U.S. is a non-party member to the fifth treaty, Agreement Governing the Activities of States on the Moon and Other Celestial Bodies. As signatory members, the U.S. has ratified the first, second, third, and fourth treaties.[389] Nonetheless, in 2000 the U.S. abstained from a vote to reaffirm the Outer Space Treaty of 1967.

[387] United Nations. "Treaty Signatures". *Office for Outer Space Affairs.*13 October 2008. http://www.unoosa.org/oosatdb/showTreatySignatures.do.
[388] United Nations. "Treaty Signatures".
[389] United Nations. "Treaty Signatures".

The Wassenaar Agreement (Arrangement)

The Wassenaar Agreement (sometimes referred to as the Wassenaar Arrangement) was established by 33 countries in 1996 with a vision to contribute to regional and international security and stability. Its purpose is to promote transparency and responsibility in conventional and dual-use arms and technologies in order to prevent conflicts and destabilization through controlled arms transfers.[390] The agreement has established control lists including "criteria for the selection of dual-use goods, including sensitive and very sensitive items," which the 40 current member countries are to abide by in their foreign military sales. Export controls are implemented by the individual participating member, so the practical enforcement of the controls is subject to national standards. This agreement makes room for regional considerations, which often override or justify certain arms exports that are not technically allowed under the treaty. However, the Wassenaar Agreement merely serves as an ex post facto reporting system for notifying member states of denial of exports. Because applicability of the agreement is up to the discretion of each member, the notification system may possibly create export opportunities for other members.[391]

Relevant to counterspace development, the Wassenaar Agreement could potentially serve as a basis for states who seek to limit the spread of certain space technology.

[390] "Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies". 1996. *Wassenaar Arrangement*. 10 October 2008. http://www.wassenaar.org/introduction/index.html.
[391] Waldrop, Elizabeth Seebode. "Integration of Military and Civilian Space Assets: Legal and National Security Implications." 2004. *The Air Force Law Review*. 55. p 191.

Missile Technology Control Regime (MTCR)

Originally concerned only with nuclear capable delivery systems, the MTCR now has established guidelines to restrict to proliferation of all missiles or delivery systems with the capacity to deliver any weapon of mass destruction (nuclear, chemical, and biological). The agreement, which has 33 partner states, even includes space launch vehicles under the definition of missile.[392] China has pledged to adhere to the ideals of the MTCR without officially joining the regime, whose export controls are domestically implemented by each partner state. Although the MTCR has important proliferation guidelines, it is only a body of loose expectations for its members. U.S. Congress has a policy to impose economic sanctions against countries who export applicable technology to non-MTCR states, and has applied such sanctions to China, India, Iran, North Korea, Pakistan, Russia, South Africa, and Syria since 1990.[393] Export controls are a common response among states, especially to defend space-oriented national security interests. They present an interesting dynamic to the topic of counterspace intentions in that non-proliferation and technology restrictions may help states to pursue space security.[394]

1963 Hot Line Agreement and its Progeny

The 1963 "Hot Line" Agreement was the first bilateral agreement between the U.S. and the Soviet Union concerning the possible negative ramifications of modern nuclear weapons. The agreement set up a wire telegraph circuit and a radiotelegraph circuit which led to a consistently open channel between nations. While limited in its scope, the agreement showed that nations

[392] "Missile Technology Control Regime." *Federation of American Scientists*. 27 October 2008. http://www.fas.org/nuke/control/mtcr/.
[393] Waldrop, Elizabeth Seebode. "Integration of Military and Civilian Space Assets: Legal and National Security Implications." 2004. *The Air Force Law Review*. 55. p 190.
[394] Waldrop, Elizabeth Seebode. p 189.

could reach collaborative agreements while in a Cold War mentality. Beyond U.S.-Soviet relations, the hot line proved useful during the Arab-Israeli war in 1967 by preventing misunderstandings of U.S. fleet movements.[395] When new technological advances emerged, the Hot Line Agreement was not abandoned; rather, it has been consistently updated. In 1978, the agreement remained in effect, and was expanded to include two satellite communications circuits, which replaced the radio circuit. The wire telegraph circuit was maintained as a back-up. In 1983, President Reagan sought to expand the hot line with a high-speed facsimile capability. This led to a congressional act (DoD Authorization Act of 1983) and a series of international negotiations held in Moscow and Washington D.C. The bilateral accord adding a facsimile line was signed in 1984 and became operational in 1986.[396]

This hot line now permits foreign leaders to exchange messages quickly, as well as detailed graphic material such as maps and charts.[397] However, these cooperative capabilities in 1986 might not have existed if the U.S. and Soviet Union had not begun cooperative negotiations 23 years earlier. Both nations decided that the benefits of an open channel, linked to a multi-faceted satellite and communications system, outweighed the costs of entrusting the other side.

Anti-Ballistic Missile Treaty

The Anti-Ballistic Missile Treaty (ABM) was signed into law by the U.S. and the former Soviet Union in 1972. The treaty placed limitations on the quality, quantity, and location of anti-

[395] "Hotline Agreements." *Federation of American Scientists*. 29 November 2008. http://www.fas.org/nuke/control/hotline/intro.htm.
[396] "Hotline Agreements."
[397] "Hotline Agreements."

ballistic missile systems that either country could use.[398] For example, according to the terms of the treaty, each country could only have two ABM deployment areas that could not be located in such a manner as to a nationwide ABM defense or form the basis for developing one. Furthermore, each country was limited to 100 interceptor missiles and 100 launchers per site.[399] Consequently, each country had a comparable vulnerability to attack by long-range ballistic missiles and the reality of mutually assured destruction served as motivation to maintain peace.

The status of the treaty became slightly ambiguous with the fall of the Soviet Union in 1991. The U.S. withdrew from the ABM treaty in 2002, but not before giving six months notice to Russia.[400] The Bush administration justified withdrawal on the grounds that the treaty was no longer needed as the Cold War had ended and relations with Russia were amicable. Further, the administration claimed that the treaty was standing in the way of developing nationwide defenses to "…protect our people from future terrorist or rogue state missile attacks"[401]. Critics of the withdrawal state that the ABM treaty could have been renegotiated to allow for the development of additional defense systems[402]. Finally, the U.S. withdrawal had consequences for international relationships outside of Russia as it has been interpreted as an American justification for developing space weapons.

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[398] United States. "Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems." Treaties and Agreements. 1972. *Federation of American Scientists*. 1 November 2008. http://www.fas.org/nuke/control/abmt/text/abm2.htm.
[399] United States. "Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems."
[400] United States. "Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems."
[401] Perez-Rivas, Manual. "United States Quits ABM Treaty." 14 Dec. 2001. CNN. 8 December 2008. http://archives.cnn.com/2001/allpolitics/12/13/rec.bush.abm/.
[402] Perez-Rivas, Manual.

Prevention of an Arms Race in Outer Space

The PAROS resolution in the UN is meant to complement and build upon the 1967 Outer Space Treaty by setting the expectation that member countries will refrain from actions contrary to the treaty's objectives. Further, the resolution states that the current space legal regime may be insufficient to guarantee the prevention an arms race in outer space.[403] While UN resolutions are not legally binding, the U.S. has been the biggest and only critic of the resolution in the UN (Israel abstained from voting).[404] U.S leadership voted against the resolution in 2005[405] and made the statement that there is no space arms race and therfore no need to place restrictions or limitations on space activities.[406]

The U.S.' opposition to PAROS agreements within the UN has an important effect on its international image. Because PAROS reaffirms the tenants of the OST, which is thought of as the basis for cooperative ventures in space, U.S. opposition comes off as being unilaterally motivated. Further, when considered in light of political actions like U.S. withdrawal from the ABM treaty with Russia or abstention from the OST, the U.S. appears to be disregarding international security.

[403] "Outer Space and the United Nations: A Backgrounder on what is Being Done to Prevent an Arms Race in Outer Space at the U.N." *Reaching Critical Will*. 3 December 2008. http://www.reachingcriticalwill.org/legal/paros/wgroup/PAROS-UN-factsheet.pdf.
[404] "Current and Future Space Security: Government Proposals." 2008. *James Martin Center for Non-Proliferation Studies*. 29 November 2008. http://cns.miis.edu/research/space/armscontrol/international/.
[405] "Current and Future Space Security: Government Proposals."
[406] United Nations. "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies."(1967) 3 October 2008. http://www.state.gov/t/ac/trt/5181.html.

Treaty on the Prevention of the Placement of Weapons in Outer Space

Russia and China jointly submitted to the UN Disarmament Conference in 2008 called the Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects (PPWT). After "recognizing that prevention of the placement of weapons and of an arms race in outer space would avert a grave danger for international peace and security," China and Russia deemed the issues in the treaty as vital.[407] Defining terms such as "weapons in outer space" and "use of force in space", this treaty seeks to expand on many ideals paramount in the OST of 1967. Article II of the treaty clearly prohibits states from launching any objects carrying weapons, installing weapons on celestial bodies, stationing any weapons in space, or the threat or use of force against outer space objects.

More important than the details of the treaty is the symbolic call of space powers to address gaps in existing space law. Chinese Ambassador Hu Xiaodi cautions that if space weapons negotiations that include the U.S. do not start now, the Conference on Disarmament would eventually need to address the disarmament of outer space. [408] Russian Foreign Minister Sergei Lavrov maintains that the treaty will preserve costly space property and strengthen general security and arms control.[409] Throughout Conferences on Disarmament and introductions of negotiations and treaties addressing space weaponization, the U.S. has maintained it has no plans

[407]"Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects." 2008. *Reaching Critical Will*. 16 November 2008. http://www.reachingcriticalwill.org/political/cd/papers08/1session/Feb12%20Draft%20PPWT.pdf.
[408]Rissanen, Jenni. "876th Meeting of the Conference on Disarmament." 2001.*The Acronym Institute for Disarmament Diplomacy*. 9 November 2008. http://www.acronym.org.uk/cd/cd12.htm.
[409] United Nations. "Conference on Disarmament Hears Address by Foreign Minister of Russia and Message by Chinese Minister for Foreign Affairs." 2008. *The United Nations Office at Geneva*. 4 November 2008. http://www.unog.ch/unog/website/news_media.nsf/(httpNewsByYear_en)/80D87E545CFCBBA0C12573ED00455AA8?OpenDocument

to build weapons for space, there is no arms race in outer space, and "there is no valid reason for proposing new arms control measures for outer space."[410]

Urgency for New International Approach to Space in Law

As nations continue to weaponize space and the possibility of a space war increases, the U.S. must understand that space is now a multi-polar universe and create policies which provide an international approach.

> The United States was the principal sponsor of the original rules [of space] but has become the principal obstacle to their legal elaboration. In order to protect efforts to develop ballistic missile defense, the United States has refused since the 1980's to consider explicit rules prohibiting deliberate attack on space objects and the deployment of space weapons in space. It has assertively blocked formal attempts to organize negotiations on those topics and has stood virtually alone against the world in doing so.[411]

The ESA, China, and Russia have demonstrated remarkable interest in maintaining stability and peace in space. The U.S. commitment to deny adversaries the use of space, public demonstration of counterspace capabilities (e.g., DoD destruction of U.S. spy satellite, Lockheed Martin test of Multiple Kill Vehicle) and refusal to discuss space weaponization is seen as a threat by other space powers. A unilateral approach to space security may actually exacerbate tensions in space, possibly increasing the likelihood of space conflict. The U.S. does not appear to appreciate the unique qualities of space as it assumes that space strategies and weaponization will work as well

[410] Mohanco, John. "U.S. Statement at the Conference on Disarmament". 2006. *Department of State*. 21 October 2008. http://geneva.usmission.gov/Press2006/0613USstatementattheCD.htm.
[411] Gallagher, Nancy, and John D. Steinbruner. "Reconsidering the Rules for Space Secuirty." American Academy of Arts Sciences (2008):pg v.

as in other domains.[412] "Because the provision of security is a central obligation of all governments on which their legitimacy depends, the disparity of capability creates fundamental issues of sovereign equity and makes the operating principles of the United States military establishment a matter of strong international interest."[413]

Regardless of content in PAROS and PPWT, it is clear that military capabilities in space are advancing with no serious effort to multilaterally discuss this situation, let alone negotiate their usage. Without legitimate support of the OST or the development of modern international legal tools that address current space issues, space vulnerability for all states continues to grow. Although the U.S. has ratified the OST, many of its actions and domestic policies are in direct violation of the treaty's principles. This can be seen in the recent development of the Multiple Kill Vehicle (MKV) and the aggressive language of the U.S. Space Policy. For any international treaties to be effective, the U.S. must first show its support for universal access to outer space, seen in the OST.

Additionally, current international treaties and agreements do not effectively mitigate the proliferation of space technology or dual-use counterspace technology. Many complications and nuances exist in treaties, especially ones which regulate the transfer of arms. An enforceable non-proliferation treaty which regulates space and counterspace technology may be a starting point for controlling the spread of space weapons because it will necessitate multilateral dialogue of space weaponization.

[412] Weeden, Brian. "Space Weaponization; Aye or Nay?" 2008. *Arms Control Association.* 29 November 2008. www.armscontrol.org/act/2008_11/Book_Review.
[413] Gallagher, Nancy, and John D. Steinbruner. "Reconsidering the Rules for Space Secuirty." American Academy of Arts Sciences (2008):pg 1.

RECOMMENDATIONS

Overall, it is important to note that space policies must be multi-polar, taking into account not only the U.S. and China but also such space powers as Russia, the European Space Agency, India, Taiwan, Brazil and Japan, among others. More than what policies the U.S. adopts, U.S. policymakers must also consider how they phrase such policies so that foreign nations do not misinterpret U.S. policy as overly aggressive. An analysis of Chinese and U.S. space and counterspace intentions led us to the following recommendations.

Manage the United States' International Image

While a strong National Space Policy is needed to support and defend U.S. assets in space, attention must be given to interpretations of this policy by foreign states. Just as the U.S. watches and analyzes foreign states' actions, it too is being watched by the world. Chinese officials, for example, are aware of U.S. policy and space activities and have "confidently concluded that the United States seeks to control space."[414] U.S. leadership must consider how documents like the 2006 National Space Policy will be received internationally. Considering a reputation that has begun to form around refusing, or leaving, various arms control agreements, something must be done to manage the U.S.' image. For example, the language of the next generation of space policies could be softened. The Clinton and George W. Bush documents deliver very similar messages, but the 1996 policy does so with softer language. If it is deemed necessary for the U.S. to withdraw from a popular agreement or to enact a strong policy, effort should be given to addressing international concerns that may arise. For example, efforts similar to those used to

[414] Blazejewski, Kenneth S. "Space Weaponization and US-China Relations." Strategic Studies Quarterly. 2008. *Air University*. 23 Oct. 2008. <http://www.au.af.mil/au/ssq/2008/spring/blazejewski.pdf>.

justify leaving the ABM treaty could be used to explain voting against PAROS or abstaining from the OST.

Maintain an Awareness of Mismatching Chinese Policies and Actions

Chinese authored literature and white papers often state that China's growing military and space capabilities are necessary to maintain a comprehensive national defense. U.S. policymakers, however, should be aware that Chinese policies and actions are not always the same. This is especially important to consider as tensions between the two states rise over economic or international issues.

An analysis of Chinese texts shows that Chinese leadership is aware of, and interested in, the tactical weaknesses of the U.S. in space, specifically the country's heavy reliance upon space-based assets like satellites. In contrast to a publically peaceful space doctrine, Chinese military officials have written about the importance of preemption in conflict[415] as well as the asymmetric advantage that can be gained over a country with such a heavy reliance on space.[416] Chinese leaders have identified the U.S. reliance upon space as its' "soft ribs and strategic weakness."[417]

In addition to the attention given to identifying U.S. military weaknesses, China also has a robust counterspace program that includes a variety of space-based weaponry like anti-satellite

[415] Orletsky, David, David Schlapak, and Barry Wilson. "Dire Strait? Military Aspects of the China-Taiwan confrontation and Options for United States Policy." 2000. *RAND Corporation*. 10 Oct. 2008. <http://www.rand.org/pubs/monograph_reports/2007/mr1217.pdf>.
[416] Burles, Mark, Michael S. Chase, Roger Cliff, Derek Eaton and Kevin L. Pollpeter. "Entering the Dragon's Lair: Chinese Antiaccess Strategies and Their Implications for the United States." 2007. *RAND Corporation (Project Air Force)*. 29 October 2008. http://www.rand.org/pubs/monographs/2007/RAND_MG524.pdf.
[417] United States. Annual Report to Congress: Military Power of the People's Republic of China 2008. *Department of Defense*. 2008. 1-56.

missiles, satellite and GPS jammers, and directed energy weapons.[418] When juxtaposed with the outwardly peaceful defensive and space policies promoted by China through mediums like the UN, this Chinese analysis of U.S. weaknesses in combination with a growing space weapons arsenal paints an unclear picture of Chinese intentions. As a result, U.S. policymakers must make difficult decisions regarding what to believe. Are Chinese leaders really trying to avoid the weaponization of space through agreements like PAROS, or are the Chinese employing contrasting public and private policies regarding space and the U.S. in an effort to gain an edge in space. Thanks largely to the opaqueness with which the government of the PRC operates, there may be no definitive answer. The best course of action for the U.S. may be to pay attention to Chinese political actions, but to be careful not to take them at face value. Maintaining an awareness of developing Chinese capabilities and any contradictions with published Chinese policy may be useful in determining Chinese intentions in space.

Reviewing Current Trade Restrictions

ITAR restrictions have cost the U.S. space industry between USD$3-6 billion since changes in the U.S. Munitions List in 1999. International collaboration with regards to space has become almost a thing of the past, and the U.S. share of the international space market has plummeted.

Additionally, the benefits of international cooperation have become nearly nonexistent. U.S. companies have a difficult time procuring contracts with international customers because of the ITAR restrictions. Countries like China, for example, have policies not to deal with ITAR at all. Companies are being harmed by these restrictions seemingly to no avail. The consensus among

[418] United States. Annual Report to Congress: Military Power of the People's Republic of China 2008. *Department of Defense*. 2008. 1-56.

opponents to ITAR is that other countries already possess a majority of the technology that is being regulated, so it is a lose-lose situation for the U.S.

Due in large part to the lack of transparency within the Chinese private sector, it is very difficult to ascertain who exactly will end up with sensitive technology once it leaves the shores of the U.S. This is because U.S. companies can designate that all of their technology exports for private sector use only. Despite such efforts, the Chinese government, through their state sponsored enterprise program, has ownership in many private companies, and therefore would have access to dual-use technology.

On the issue of economic interdependence, China has been artificially sustaining its massive trade surplus with the U.S. through the manipulation of exchange rates between the dollar and the yuan, as well as the subsidization of private industry to bolster production so Chinese companies can sell goods at lower cost. These methods are in violation of WTO agreements and should not be condoned by the U.S.

It is very possible that even with current ITAR restrictions parties are that not supposed to receive sensitive technology would receive it anyway. In the interest of national security, it would be prudent to further strengthen ITAR restrictions so that international governments would not be able to procure the technology.

Therefore, it is recommended that the U.S. conduct a review of current ITAR restrictions and make changes in accordance with future interests and policy.

Refrain from Confrontational Strategies

Expanding from lessons of China's culture, it is easy to see that the Chinese highly value community standing and seek international prestige. This corresponds not only with heightened senses of nationalism and culturalism, but also from cultural tendencies such as the need to achieve "face" or *Mianzi* and *Lian*. This can be partly achieved if the U.S. acknowledges China's growing power in not only space, but also economic and international relations. [419] Acknowledging China's recent growth in both sectors will not require any sacrifices on the U.S.' behalf, but will likely soften the image of the U.S. Related to the concept of *guanxi*, the U.S. should not focus on controlling China's power through direct threats or economic measures. The Chinese prefer long term strategies of constant giving of favors and direct measures from the U.S. would only continue perceptions the Americans are boorish and rude. This also ties into the social categorization effect of *guanxi*, as an "us vs. them" mentality would continue. It does not benefit the U.S. for China and foreign countries to consider the U.S. as a hegemon bent on space dominance. Furthermore, attempts to directly stifle China's progress would likely backfire, creating increased resentment toward the U.S. and hamper harmonious U.S.-China relations. The goal, instead, should focus upon turning any aspect of a possible U.S.-China space race into a "benign competition."[420]

Lieutenant Colonel Troy L. Dixon described a U.S. approach to achieving increased cooperation with the Chinese.[421] Dixon stated that U.S. policy must not appear confrontational or adversarial to the Chinese. Direct confrontation will likely cause the Chinese to feel threatened and make

[419] Haass, Richard N. "The Case for 'Integration'." The National Interest 81 (2005): 30 September 2008. http://www.cfr.org/content/publications/attachments/Haass_Case_for_Integration.pdf.
[420] Dixon, Troy L. "More Dreams in Longer Night: United States China Policy." 2006. U.S. Army War College Strategic Research Project. 27 October 2008. http://www.strategicstudiesinstitute.army.mil/pdffiles/ksil329.pdf.
[421] Dixon, Troy L.

more political decisions based upon reducing this perceived international threat. The CCP often focuses upon nationalism, and public outrage often stems from perceived unfair treatment by the West rather than any traditional communist ideology.[422] The Chinese government is unwilling to compromise on any issue which hinders national unification because Chinese leaders consider unification to be the secret of immortality for a civilization.[423] Therefore, any confrontational measures enacted by the U.S. to reduce China's ability to compete in space might appear as an attack to China as a whole and offend nationalistic notions. This would make "inroads to democratic reform difficult if not impossible."[424]

Attempts at collaboration must also consider the political climate. Many rebuked the Clinton Administration for having "their lips firmly planted on Beijing's boot."[425] It is argued that Clinton's policy of "constructive engagement" led to continued "appeasement" and deferential (and potentially dangerous) behavior toward China.[426] One potent example concerns the 1999 accidental bombing of the Chinese embassy in Belgrade by U.S. planes under the direction of NATO. After the event, the U.S. Department of State provided a very detailed and apologetic briefing to the government of the PRC.[427] Some conservative critics found the apology too apologetic and derided the U.S. response to "violent, week-long" protests at the U.S. Embassy.[428] George W. Bush's administration did not soon overturn this approach, as his policy

[422] Bajoria, Jayshree. "Nationalism in China." April 28, 2008. The Washington Post/ Council on Foreign Relations. 21 September 2008. http://www.washingtonpost.com/wp-dyn/content/article/2008/04/28/AR2008042801122.html.
[423] Scobell, Andrew. "China and Strategic Culture." 2002. *Strategic Studies Institute*. 7 October 2008. www.strategicstudiesinstitute.army.mil/pdffiles/pub60.pdf.
[424]Dixon, Troy L. "More Dreams in Longer Night: United States China Policy." 2006. U.S. Army War College Strategic Research Project. 27 October 2008. http://www.strategicstudiesinstitute.army.mil/pdffiles/ksil329.pdf.
[425] Carpenter, Ted Galen. "Appeasing China, Humiliating Ourselves." 2000.*CATO Institute.* 23 September 2008. http://www.cato.org/pub_display.php?pub_id=4620.
[426] Timperlake, Edward and William C. Triplett. Year of the Rat: How Bill Clinton Compromised United States Security for Chinese Cash. Washington, DC: Regnery Publishing ,1998.
[427] United States. "Report on Accidental Bombing of Chinese Embassy". 6 July 1999. *Department of State*. 19 October 2008. http://www.state.gov/documents/organization/6524.doc.
[428] Carpenter, Ted Galen.

"toward Asia is one of continuity rather than change."[429] The recommendation here is one of balance. U.S. aggression toward China will be an offense to Chinese nationalistic pride and their sense of self and will provoke future actions, but U.S. acquiescence might place the U.S. in a permanent state of reactivity, unprepared for China's emerging power.

Cooperative Measures

The United States has great power to influence the international approach to space weapons. "Not since the development of the atomic bomb has the United States had an equivalent opportunity and incentive to show leadership for restraint in the development of a new class of weapons, namely weapons in space."[430] With foreign nations either fearful of or in awe of the U.S. space capability and past achievements, the U.S. must refrain from a position of space dominance and consider cooperative measures instead. These measures should focus upon not only strengthening U.S.-China relations in space, but also assuring international cooperation to prevent unnecessary space weaponization and attacks such as satellite jamming.

The U.S. can utilize many diverse options to achieve cooperation, ranging from formal agreements such as treaties and executive agreements to informal negotiations and discussions among states. Whichever method the U.S. selects, cooperative measures must be transparent enough to allay any country's fear that the U.S. speaks of cooperation while building its own arsenal of space weapons.[431]

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[429] Bacevich, Andrew J. "Bush and Asia: Continuity or Change?" 2003. *Woodrow Wilson International Center for Scholars*. Ed. Robert M. Hathaway and Wilson Lee. 7 October 2008. p 25-34. http://www.wilsoncenter.org/index.cfm?fuseaction=news.item&news_id=21871.

[430] "Drawing the Line: The Path to Controlling Weapons in Space," *Disarmament Diplomacy*, No. 66 (September 2002), p. 5. (cited by Clary, Christopher and Michael Krepon. "Space Assurance or Space Dominance? The Case Against Weaponizing Space." 2003. *The Henry L. Stimson Center*. 26 October 2008. http://www.stimson.org/pub.cfm?ID=81. p.89).

[431] Clary, Christopher and Michael Krepon. "Space Assurance or Space Dominance? The Case Against Weaponizing Space." 2003. *The Henry L. Stimson Center*. 26 October 2008. http://www.stimson.org/pub.cfm?ID=81.

This issue becomes particularly difficult because most technological advances in space have both a military and commercial/civil purpose and "space warfare" is neither a black and white issue nor one likely to occur in the short term. Any future actions resembling "space warfare" might be incremental advances in weaponization and actions such as satellite jamming rather than missile attacks of satellites. But that does not mean the U.S. should sit idly by as countries advance their space technologies. Twelve years before the Chinese ASAT test, policymakers noted that "ASATs possess a considerably greater capacity for transforming a crisis into a war, and for enlarging wars, than they do for assisting in military missions or enhancing deterrence."[432] While the notion of "space warfare" is still not likely in the short term, the U.S. should consider international measures which lead to worldwide cooperation in space.

Policymakers are urged to start making advances on "what is politically feasible and useful first."[433] One option to start the process of cooperative measures is to begin "cooperation at the fringes." Under this strategy, states agree on the more tangential issues of space warfare such as debris management and a national register of objects launched into space. Over time, this cooperation breeds further cooperation on more militarized issues such as the use of ASATs and counterspace technologies.[434]

Chinese government spokespeople have made consistent statements regarding their interest in international treaties as an approach to prevent a space arms race. One potent example emerged in June 2002, when Russia and China jointly submitted a space weaponization ban to the Conference on Disarmament. This ban included not only weapons on celestial bodies, but also

[432]Clary, Christopher and Michael Krepon. "Space Assurance or Space Dominance? The Case Against Weaponizing Space." 2003. *The Henry L. Stimson Center*. 26 October 2008. http://www.stimson.org/pub.cfm?ID=81 citing "Antisatellite Weapons: Weighing the Risks," in "Weapons in Space, Vol. I: Concepts and Technologies, *Daedalus*, 114, no. 2 (Spring 1985), p. 148.
[433] Clary, Christopher and Michael Krepon. "Space Assurance or Space Dominance? The Case Against Weaponizing Space." 2003. *The Henry L. Stimson Center*. 26 October 2008. http://www.stimson.org/pub.cfm?ID=81..
[434] Personal interview in Washington, D.C. (NG).

any weapon placed "in outer space in any other manner."[435] Russia and China also recommended "confidence-building measures, including information exchanges on space policy, space launch sites, and the property and parameters of objects being launched."[436]

Still, a lack of transparency has led some U.S. officials to doubt whether this stems from a genuine Chinese interest in international cooperation or, rather, as a way to unilaterally gain technological advances in what could become a "Space Pearl Harbor." [437] The concept of creating agreements which demand an open channel of communication between countries is not novel to space relations. Instead, much can be gained from understanding and reanalyzing U.S.-Soviet Union agreements made during a time in which both countries were locked in a Cold War mentality. Furthermore, an international workshop coordinated by The Stimson Center's Space Security Project in November 2008 focused directly on these goals.[438] Diplomats from Canada, China, France, Germany, India, Italy, Japan, Russia, and the U.S. agreed to bring three initiatives back to their countries for discussion:

1. An agreement to enter into negotiations on a treaty that would seek to ban the testing and use of destructive methods against space objects.

2. Pending the completion of such a treaty, states participating in the negotiations would agree to pledge not to test or use destructive methods against space objects.

3. An agreement to enter into negotiations on a Code of Conduct including transparency and confidence-building measures with preambular language outlining a common vision for the peaceful uses of outer space in which weapons are not deployed.

[435] Clary, Christopher and Michael Krepon. "Space Assurance or Space Dominance? The Case Against Weaponizing Space." 2003. *The Henry L. Stimson Center*. 26 October 2008. http://www.stimson.org/pub.cfm?ID=81.Working paper on PAROS presented to the U.N. Office in Geneva (June 27,2002).
[436] Clary, Christopher and Michael Krepon.
[437] Rumsfeld Space Commission Report.
[438] Space Security Project: International Workshop to Promote New Space Diplomacy Initiatives. *The Stimson Center*. December 11, 2008. Executive Summary. [e-mailed summary of workshop from Michael Krepon].

In particular, the third initiative's goal of both increased transparency and confidence-building measures will likely allow other countries to better understand each others' goals and intentions and ultimately correspond with more cooperative ventures. While countries cannot blindly trust other countries in times of political conflict, open communication is necessary to prevent an upcoming space arms race. The following recommendation further discusses an international framework for addressing space.

Multilateral Legal Approach to Space

There are two methodologies for addressing vulnerability in space: unilateral action with a perception of space as a contested domain, and multilateral action with a perception of space as a cooperative domain. The U.S. should choose the course of action most beneficial to its national and economic security.

Current U.S. space policy and action have denoted the unilateral approach to space, seen through moves like withdrawal from international legal framework such as the OST and also a formalized domestic commitment to potentially deny adversaries access to space. However, this isolationist approach to space does not adequately address the realities of space weaponization in a multipolar world, and actually renders the U.S. more vulnerable in space.

The U.S. maintains that it cannot limit its access to space because of national security interests; admittedly, its military and commercial infrastructures are completely run by space systems. By avoiding treaties that define an appropriate use of space, other states will see no reasons to limit their own access. Fear of Chinese and Russian counterspace capabilities stems from the U.S. concern of their attempts to dominate space, much like it is seeking to do. The U.S. has a special interest in maintaining international space security and stability. Perhaps if it takes multilateral

steps to limit the usage of counterspace capabilities now, it will better protect its assets in space in the future.

The OST offers an optimum level of cooperation for the use of space. This international legal tool views space as a cooperative domain, rather than a contested one, and opens doors for further development in new multilateral ventures. In order for other nations to want to cooperate with the U.S. or have an interest in protecting its assets in any type of space treaty, the U.S. must reassure its commitment to space as a cooperative domain. Only after reaffirming its adherence to the OST and opening doors for cooperation will the U.S. be able to embark on addressing modern complexities of space weaponization.

Without effort for marked cooperation, conflict in space could become an even greater threat. Noncooperation and unilateral action fuels distrust and weapon development. Such weapon development encourages other nation states to seek counterspace abilities for deterrence. Because space is international territory and conflicts affect all of its occupants, the proliferation of space weapons should be evaluated in terms of both national security and international stability. One of the strongest methods to ensure mutual protection of military and commercial assets would be to address the proliferation of space weapons and space technology through an international legal framework.

Since standards for the usage of space remain relatively undefined, assets and operations currently in space could be vulnerable. Norms for counterspace usage and proliferation could actually complement the U.S. national security quest to secure its space assets. Without an agreement or treaty, there is little oversight of states such as China who develop and sell space technology to newly emerging space powers, such as Pakistan. Establishing enforceable

international standards for the purchasing of space technology would foster U.S. and international oversight in the proliferation and usage of such powers, much like the transferring of nuclear technology.

It is paramount to note that the greater the number of states who acquire counterspace capabilities, the more likely that an escalation to space warfare could occur. Even practical tweaks to existing treaties, such as modernized definitions, may go a long way to securing space assets. Therefore, the U.S. should embrace its leadership role and pilot the collaborative movement to *address* the many potential harms of space weaponization with multilateral dialogue. From these exchanges, space faring powers are better equipped to define the rules for space. Such engagement is an opportunity for the U.S. to multilaterally guard its interest in space.

Admittedly, pursuing such a policy requires trust and faith that agents of other states will also pursue multilateral policies peacefully. Transparency in the process may increase trust and decrease suspicion of defective behavior, but verification will likely always remain a concern. Still, the gains from such a policy focused on a peaceful, less weaponized (and, therefore, less risky) use of space should far outweigh U.S. losses from a space race. Currently positioned in the upper echelon of political, social, and military power, the U.S. stands as one of the states with the most to lose from a conflict in space. Policymakers should recognize that, while pursuing the recommendations of this paper might place the U.S. in some risk, the risk from current policies could be greater. International relations theory predicts a continued build-up of space weapons. This continued development infinitely increases the risk that such weapons will be used.

A conflict involving space weapons has potential to be the most destructive war in human history. Destruction of satellites will harm not only major space powers, but also all countries that benefit from global communication and the economic benefits derived from such satellite technology. In a worst case scenario, destruction of a significant number of satellites in space could envelop the globe in a cloud of debris, forever preventing the launch of new satellites. Without the capabilities of instant communication and information transfer people have grown used to, the human enterprise would digress half a century.

CONCLUSION

Extensive multifaceted analysis of Chinese culture, Chinese perceptions of space, the impacts of space weaponization, and the role of the U.S. in space, has led to a series of recommendations. Overall, the U.S. must understand space as a collaborative venture. An increased effort given toward dialogue and a softening of what some Chinese perceive as an overly aggressive space policy will help the U.S. bolster their international image. Increasing cooperative measures does not mean that the U.S. must sacrifice national security; instead, it is recommended that U.S. decision makers better understand Chinese culture in order to understand how U.S. actions can be misinterpreted by the Chinese and review the costs and benefits of current trade restrictions in light of revenue, innovation, and national security. It is essential to thoroughly examine the extent of all possible consequences of space weaponization in order to avoid a space arms race and how policy, culture, and economics all tie into the space equation. This would not be the first international, collaborative space venture. The International Space Station shows how cooperation can lead to superior scientific endeavors. Accordingly, it is suggested that the U.S. should consider allowing China to join the ISS. This could become an excellent opportunity to establish mutual collaboration and a stronger bilateral relationship. The U.S. should also consider re-affirming the Outer Space Treaty of 1967 to reassure its commitment to cooperatively work in space. In conclusion, collaboration and a legally binding, enforceable, counterspace non-proliferation treaty could both greatly help to avoid an arms race in outer space and protect U.S. space assets.

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ABOUT THE AUTHORS

Michael Caldararo is a graduate student at the University of Nebraska at Omaha (UNO) studying Public Administration. He earned his undergraduate degree in Criminal Justice with minors in Psychology and Sociology in 2006 from UNO as well. His primary research interests are local government management and public policy.

Jason Cantone graduated from the University of Nebraska College of Law with his J.D. and M.A. in Psychology and is currently a doctoral student in Law and Psychology. His research focuses upon decision making models and his published research concerns the faults with the United States Congress' attempt to reduce consumer credit card dependency. He is also an instructor at University of Nebraska-Lincoln, teaching classes such as Psychology of Social Behavior.

Jonathan Cowin is a senior at Creighton University, specializing in economics. He also served as a summer intern at Microsoft Corporation.

Hailey Rademacher is a junior at Creighton University, studying international relations and French. Her primary interests include international law, effects of arms transfers on regional conflicts, foreign language, and creation of a new model for the effective implementation of sustainable development in third world states.

Drew Sendelbach is currently enrolled in the International Relations program to earn a Master of Arts degree from Creighton University. Drew also attended Creighton for his undergraduate education, graduating magna cum laude with a major in Political Science and minors in Economics and Communication Studies. His primary research agenda interests include global environmental issues and rules making within institutional design.

Rachel Huggins is a junior at Creighton University studying political science and business administration. Her primary interests include Arabic, the Arab culture and the development of democracy in Arab states. She is also interested in China and the Chinese culture and is learning both Chinese and Arabic.