

Rising Moon: The Geopolitical Significance of Japan's First Moon Shot in 2018

Marshall Bennett
Georgetown University

Abstract

This study examines the geopolitical context of the Japan Aerospace Exploration Agency's (JAXA) announcement of its first moon shot in 2018 and how the mission connects to Japan's national competitive strategies against its neighbors. After discussing the current space competition in Asia and the security challenges that Japan confronts in the post-Cold War era, the study surveys how a lack of cooperation in space among Asian countries due to unresolved historical issues have led to a redundancy among space programs. The study then considers how Japan has adapted the foreign dimension of its space policy to this environment and how the nation can create opportunities for greater regional cooperation in space. The study concludes that Japan (with support from the U.S.) can create new forms of multilateralism via transparency and confidence building measures (TCBMs), which would serve as stepping stones for Asian nations to ensure that access to space remains safe and secure.

Introduction

On April 19, 2015, the Japan Aerospace Exploration Agency (JAXA) announced its plan to attempt Japan's first lunar landing by fiscal 2018. Funding is contingent upon approval by the Ministry of Education, Culture, Sports, Science, and Technology (MEXT)—the authoritative body that holds primary responsibility for JAXA's finances and personnel (Anan, 2013, p. 1). If approved, JAXA will use its Epsilon solid-fuel rocket technology to launch and deploy a SLIM (or Smart Lander for Investigating Moon) probe onto the celestial surface (McKirdy, 2015). Officials indicate that the mission's purpose is to collect data and develop technology to conduct soft landings, both of which could be later used for a manned mission to Mars (End, 2015). However, while the unmanned moon mission would enhance Japan's international prestige in space and technology, their efforts are redundant with the achievements and objectives of other nations in Asia and thus demonstrate a lack of regional cooperation in space. Moreover, while JAXA's moon mission is scientific in its purpose, its geopolitical context connects to Japan's competitive national strategy against neighboring threats from North Korea and China (Kallender-Umezu, 2015). This paper discusses 1) the context of the current space competition in Asia, 2) the challenges Japan faces in the post-Cold War era, which have led the nation to alter its space strategy, 3) the redundancy in space programs and lack of cooperation in space that characterizes the Asia region, 4) the foreign policy dimension of Japan's space policy, and 5) prospects for regional confidence-building measures.

I. The Current Space Competition in Asia

James Clay Moltz (2012), a professor in the U.S. Naval Postgraduate School's Department of National Security Affairs, notes that Japan's overall motivations for space activity are indicative of the Asian space rivalry (or second space age) taking place, where Asian nations compete for regional recognition in space technology and achievements. The second space age began in October 2003 when China became only the third country in the world, after the United States and Russia, to demonstrate its human spaceflight capabilities with the return landing of *Shenzhou 5* (Moltz, 2012, p. 12). Relative to the United States and Russia, however, China is a new entrant as a space power, and its rapid and impressive progress in space technology has largely been based on the pioneering achievements of the U.S. and Russia. In his report to the U.S.-China Economic and Security Review Commission, Kevin Pollpeter (2015) emphasizes that while China is probably truthful in expressing that it is not in a space race, such statements cloud the true objective of its space program—"to become militarily, diplomatically, commercially, economically as competitive as the U.S. is in space" (p. iii).

At the same time, unlike the bipolar dynamics of the space race during the Cold War era, the current competition is multipolar due to the economic globalization of information, investments, and ready availability

of space technology in the international market (Moltz, 2012, p. 14, 22). Setsuko Aoki (2009), a professor at Keio University and former associate professor at the National Defense Academy of Japan, highlights that antagonistic dyads (India-China, China-Japan, India-Japan, India-Pakistan, Japan-South Korea, and North Korea-South Korea) characterize the space contest in Asia (p. 369). Yet the rivalry is less of a quest for world leadership than it is competition for *regional* ascendancy, technological prowess, economic advantage, and power (Moltz, 2012, p. 32). In turn, the pursuit for dominance in these areas has influenced and led to national space programs that are siloed from neighboring nations. While the high risks and costs of space should encourage collaboration, the current realities of the regional dynamics have limited space cooperation.

II. Japan's Challenges in the Post-Cold War Era

Kazuto Suzuki (2008), a professor at the University of Tsukuba and advisor to JAXA, notes that the post-Cold War era has brought new circumstances to Japanese space strategy (p. 134). While the threat of communism has been dramatically reduced, regional events since the 1990s between China and Japan—such as ongoing territorial disputes, unsettled wartime issues, China's nuclear tests in the 1990s and missile tests in the Taiwan Strait, as well as growing nationalism and military objectives on both sides—have compelled the two nations to become more defensive towards each other due to ambiguity in the other's intentions. At an economic level, in 2010, China replaced Japan as the second largest economy in the world—a status that Japan had originally earned during the Cold War. Now China, not the U.S. or Japan, has become the biggest trading partner for many of its neighbors (Barboza, 2010). The rise of the Chinese economy was also paralleled with its rapid entry into human spaceflight.

However, changes to Japan's space strategy were not only precipitated by China's accomplishment of landing the *Shenzhou 5* in 2003 but also stem from the North Korean nuclear crisis, which began in 1993. This threat was evidenced by North Korea's construction of nuclear weapons, retraction from the Non-nuclear Proliferation Treaty (NPT), a No-dong missile launch, and lack of cooperation to permit inspections by the International Atomic Energy Agency (IAEA) (Green, 2001, p. 121). Furthermore, after refusing to allow Japan to join the 1996 Four Party Talks (which included the U.S., China, and South Korea) as a means to reach a peace agreement, North Korea launched a two-stage Taepo-dong missile over Japanese territory in 1998 (WuDunn, 1998). Thus, during the immediate post-Cold War era, the compilation of nuclear threats and lack of transparency by both China and North Korea caused Japan to alter its original Cold War strategy of keeping defense investment out of space activity. This led to the decision to initiate a new satellite program, the Information-Gathering Satellite (IGS), which monitors the military activities of adversaries, as well as the joint U.S.-Japan Defense program

in 2003 (Suzuki, 2008, p. 135-136). Yet, China's gradual integration into the liberal international system was met by other challenges that caused Japan to make additional adjustments.

In her article, "Strategic Imperatives for US-Japan Outer Space Cooperation," Crystal Pryor (2012), a former Japan Studies Visiting Fellow at the East-West Center, adds that the security challenge was further heightened in January 12, 2007 when, without prior notification, China conducted an anti-satellite test on a defunct weather satellite, which created over 3,000 pieces of debris (p. 1). Members of the Science and Technical Subcommittee (STSC) of the United Nation's Committee on the Peaceful Uses of Outer Space (COPUOS): Canada, Czech Republic, France, Germany, Japan, and the U.S., expressed serious concerns about how China's new demonstrated space capability poses a danger to manned space activities and other space programs (Aoki, 2008, p. 49-50). While China responded that the test did not constitute a threat to any country, its actions "refreshed Asian understandings of the potential capability of China's military force, People's Liberation Army" (Suzuki, 2008, p. 141). From the international community's perspective, China's turn from its successful manned mission in 2003 to direct weaponization was not readily accepted (Banerjee, 2008, p. 130). Indeed, Japan categorized Beijing's act as a "violation" of the 1967 Outer Space Treaty (OST), which espouses the use of space for peaceful purposes (Moltz, 2012, p. 64). Ultimately, the event further compelled Japan to consider other measures to increase its space capabilities.

Thus, within the context of North Korea's unpredictable behavior and its own mistrust of China's intentions in space, Tokyo passed a revised national legislation on space in 2008: the Basic Space Law. As Pryor (2012) observes, "The law shifted Japan's longstanding interpretation of the 'peaceful purposes' clause of the Outer Space Treaty from 'non-military' to 'non-aggressive' use of outer space" (p. 1). In other words, the reinterpretation permits military authorities to use space assets, such as the development of space satellites, for self-defense. While in a regional context the change is bold, the new approach is in accordance with other Western positions (as signatories of OST) on the peaceful purposes of space (I. Marboe: Former Chair of Legal Subcommittee of the UN Committee for the Peaceful Uses of Outer Space, personal communications, March 7, 2016).

As a side note, another driver for passing the Basic Space Law was to facilitate Japan's commercial space sector to move beyond its national market and provide international space services. This was originally based on the success of both Mitsubishi Electric Company's commercial contract with a joint venture between Taiwan's Chunghwa Telecom and Singapore's SingTel in 2008 and Mitsubishi Heavy Industries' commercial launch contract with South Korea in 2009. Aoki highlights that the Japanese government believed it was necessary "to promote and assist the space industry as a national project" (Moltz, 2012, p. 61). As a

result, since 2007, JAXA has been collaborating with IHI Aerospace, a domestic aerospace company, to help design the Epsilon rocket that is anticipated to launch the SLIM probe in 2018 (“IHI Aerospace: Epsilon Launch Vehicle,” 2015).

Despite these recent successes, however, some observers note that the future for Japan’s “industrialization” of space remains limited. As Moltz (2012) has observed, with the rise of space competitors in Asia and Japan’s aging population, “JAXA and other government agencies view the need to stimulate younger people’s interest in space as a national priority” (p. 62). In particular, Takeshi Hakamada, the team lead for Google Lunar X Japan and CEO of ispace technologies, Inc., hopes that more individuals from the younger generation undertake emerging challenges via Japan’s space industry of legacy companies and startups (T. Hakamada, personal communications, August 17, 2015). Thus, given the regional and domestic obstacles of the nation, “a strategic decision seems to have been made that continued growth in space capability remains critical to Japan’s image, technological reputation, and security” (Moltz, 2012, p. 63). This is especially the case when considering how the U.S. space industry’s technical reputation is being transformed by embracing the commercial sector’s development of lower cost launch vehicles (both for satellite and human spaceflight) and spacecrafts.

Given the geopolitical changes in the region and Japan’s need to support its commercial space industry, in 2009, the Strategic Headquarters for Space Development, chaired by the prime minister, created the Basic Plan for Space Policy which aims to realize “a safe, secure and affluent society through the development of space use as well as strengthening national security through the development of space use” (Maeda, 2009, p. 3). Combined, the Basic Space Law and Basic Plan for Space Policy emphasize the role outer space should play in Japan’s national security and the strategic development of the nation’s domestic space industry (Pryor, 2012, p. 1). To reach these objectives, a 2012 legal amendment was later established to allow the Cabinet Office to create a new Space Strategy Office, while also modifying JAXA to “work flexibly for each ministry’s administrative purposes, including national security” (Anan, 2013, p. 8). This has led, for example, to JAXA directly cooperating with the Ministry of Defense (MoD) to support a MoD-built infrared missile sensor on a JAXA-built reconnaissance satellite, as well as the development of more maneuverable surveillance-satellite technologies to capture sharper images (Kallender-Umezu, 2015).

In January 2015, Japanese Prime Minister Shinzo Abe confirmed the nation’s priority in bolstering its national security in space and domestic space industry by approving the 2015 Basic Space Plan. Marked as a “historic turning point,” the law announces that “[Japan] will engage in space development to directly utilize it for [the] nation’s diplomatic and security policies, as well as for the Self-Defense Forces” (Kyodo Staff Report, 2015). A published Japanese government report notes that the shift

away from research and science is in reaction to changes in the regional security environment (Pultarova, 2015). The law seeks to further develop the quasi-zenith satellite system (QZSS), space situational awareness (SSA), space debris clean-up technology, X-band satellite-based communication network, information gathering satellite, operationally responsive satellites, and advanced optical and radar satellites. In conjunction with Japan's National Security Strategy (which advocates for Japan's right to collective self-defense), this new policy is supplementary to Abe's decision in 2014 to depart from the nation's postwar pacifist approach by permitting export of arms and allowing Japanese troops to engage in overseas combat (Pultarova, 2015). The Strategic Headquarters for Space Policy highlights that the law marks a new era for both nations (Strategic Headquarters for Space Policy, 2013).

In summary, the post-Cold War era has been partly characterized by East Asian nations adapting to a new geopolitical and economic environment. For Japan, Cold War national security policies, such as the original Basic Space Law, were made in agreement to respect the U.S. alliance by observing constitutional constraints on the nation's defense capabilities. However, this anachronistic approach requires some updating in an era when Japan sees a need to take on greater defense responsibilities due to security threats from China and North Korea. While the ascendancy of China's economy and space program is impressive, China will have to abide by maturing within the boundaries of the existing liberal international system's agreements. In terms of North Korea, as one of the last nations under communist rule (with a one-person dictatorship and centralized economy), Pyongyang's unpredictable behavior stems from its fear of survival in the world. Although the international community's attention has been largely focused on the nation's missile program and attempted space launches, there does not appear to be a methodical plan for developing a space industry (Moltz, 2012, p. 170). In turn, the state of these geopolitical relations and issues has influenced how Japan pursues its space program, both civil and military. Yet, the challenge remains if its neighbors are ready to accept what the nation has become.

III. Redundancy and Lack of Cooperation

At the same time, distrust in the region is directed not only towards China and North Korea but also towards Japan. Tensions essentially center on two reinforcing issues: Japan's potential for rearmament and its imperial past. With unresolved historical issues from its colonial period during World War II, Michael Mochizuki (1994) of George Washington University notes, "the way in which Japan has dealt with its...past is just as, if not more problematic, than its modernizations programs" (p. 138). The onset of the post-Cold War opened the prospect for these issues to surface and create tense bilateral relations because Japan and China were no longer indirectly aligned against the Soviet Union (Green, 2001, p. 78). In contrast, as Mochizuki (1994) points out, because the U.S. is now the

only buffer between their differences and is partly responsible for Japanese security, “the Chinese could assume Japan’s military forces would remain limited; and as long as Japanese forces remained limited, they would pose no threat to China” (p. 160).

This perspective was, in part, based on Japan’s first Basic Law on space activity in 1969, which prevents Japan from using space for military purposes. Moltz (2011) highlights, “For these reasons, [Japan] has not developed as quickly in space as it might under ‘normal’ circumstances in other countries, given the size of its economy” (p. 74). When compared to China, Japan has not yet created its own human space flight program and has relied on the U.S. to launch its astronauts to the International Space Station. Japan is well situated to compete in space, but as evidenced by Abe’s approved 2015 Basic Space Law, it will have to continue to weigh other national priorities such as budgetary limitations, its longstanding pacifist constitution, “and questions about the need to achieve full autonomy given the significant benefits available from its close cooperation with the U.S.” (Moltz, 2012, p. 44). Even with the end of the Cold War, the U.S.-Japan alliance still remains the cornerstone of security in East Asia. Despite tensions, the region is more stable under a U.S.-Japan (and U.S.-Korea) alliance than without it.

However, Daniel Sneider of Stanford University’s Freeman Spogli Institute emphasizes that many Japanese of all political backgrounds were never comfortable with a strategy of reflexive dependence on the U.S. He elaborates, “There is a growing consensus that Japan should be a ‘normal’ nation, with the weaponry and independence of action that implies” (Sneider, 2013). For instance, Japanese Prime Minister Shinzo Abe’s cabinet includes a mix of pragmatic realists who want to expand Japan’s security role in close coordination with the U.S. as well as revisionist nationalists who desire a face-off with China and express unrepentant views about Japan’s wartime past (Sneider, 2013). In fact, Abe’s most recent U.S. visit with President Obama in April 2015 was prompted by a need to reassess the dynamics of the alliance due to the changing regional and global security environment—which has been partly shaped by China’s lack of transparency with its growing military and assertive behavior in the East and South China Sea (Tiezzi, 2015). Among the agreed-upon guidelines, Abe and Obama’s discussion included global military cooperation in defense against ballistic missiles as well as cyber and space attacks.

In particular, both nations reaffirmed their commitment to cooperating in Space Situational Awareness (SSA)—which allows for the vital tracking of space debris and provides a range of other applications (such as early missile warning functions). The agreement includes, “establish[ing] and improv[ing] capabilities and shar[ing] information about actions and events that might affect the safety and stability of the space domain and impede its use” (Pomerleau, 2015). The defense guidelines continues to note that U.S. Armed Forces and Japanese Self-

Defense Forces will cooperate in mitigating risks and preventing damage when their space systems are threatened, alluding to China's Anti-satellite (ASAT) weapons test designed to destroy satellites for strategic military purposes. Thus, with a noticeable gravitation towards a more "normal" role in space, Japan's neighbors are especially concerned with the nation's decision to alter its 40-year-old Diet Law on space activity and to permit military uses for the first time. As some observers would note, space has become a venue to address deep-seated historical rivalries.

In turn, with each state over-insuring against perceived risk from the others, space has become an extension of other competitive areas, where Asian countries carefully observe regional rivals in order to match, or at least check, their capabilities, influence, and power. According to Moltz (2012), this realist type of behavior has created an environment where "Asian space powers are largely isolated from one another, do not share information and display divergence of perspectives with their space goals and a tendency to focus on national solutions to space challenges and policies of self-reliance rather than on region wide policies or multilateral approaches" (p. 2). In agreement with Peter Katzenstein and Christopher Hemmer's (2002) essay, "Why There is No NATO in Asia," there is a lack of institutional experiences that could help create a sense of community and provide a collective identity in the Asia-Pacific. The Cold War and post-Cold War experiences in East Asia can be partly characterized by each nation becoming a part of the international economy and community during different periods. This has contributed to the development not only of incongruent identities but also of different degrees of sophistication in their space programs.

In contrast to the regional collaboration that defines the European Space Agency (ESA), the overshadowing influences of national identity, politics of nationalism, and collective memory of history in Asia leaves little potential for cooperation among major space-faring powers, which, in turn, has resulted in the duplication of efforts (Pryor, 2012, p. 1). For example, in response to China's 2003 manned mission, India is "developing an Indian manned flight program with the launch of Indian astronauts planned by 2016-2018 using manned spacecraft and launch vehicles developed in India" (Covault, 2012). In addition, since 2007, there have been three, separate lunar mapping missions by Japan, India, and China (Moltz, 2011, Dec.). In particular, China had already conducted its own unmanned lunar landing in 2013, the same year that South Korea announced its intent to launch an unmanned lunar rover. While these individual accomplishments and plans are notable, the problem is that the nations are competing with each other to get to the next level (thus, duplicating efforts) instead of co-developing programs that serve the national or international good (Moltz, 2015).

In reference to the United Nation's establishment of the International Day of Human Space Flight, Secretary-General Ban Ki-moon highlights that the day will "remind us of our common humanity and our need to

work together to conquer shared challenges” (“UN: International Day of Human Spaceflight,” 2015). Although the following will be addressed later in greater detail, it is appropriate to also note here that one path for East Asian nations to look past historical rivalries and the burdens of historical memory is to consider the common threats they face in the region. The great challenges of the 21st century: energy, climate, health, natural disasters, etc., are issues that transcend the capabilities and resources of any one nation or sector (“UNOOSA: Benefits of Space,” 2015). From remote sensing of epidemiological patterns of infectious diseases to monitoring change in soils, space-based technologies will play a vital role to addressing these issues. However, as highlighted by John F. Kennedy in his 1962 Moon Speech at Rice University, space is hard, and resolving these issues will require the combined efforts of nations.

IV. Foreign Policy Dimension of Japan's Space Policy

Rather than creating a single Asian space body to discuss mutual security approaches to space, China and Japan have each formed their own regional space organizations to maintain their sphere of influence and pursue individual goals. In addition to the geopolitical factors discussed, Moltz (2011) notes that this has been due to the availability of alternative partners (Russia, Ukraine, France, the United Kingdom, and, for some, the United States) with more advanced capabilities, as well as stronger ties with less developed countries, which has made regional cooperation within Asia seem unnecessary and undesirable (p. 72). These dynamics are exemplified by Japanese, South Korean, and Indian relations with the U.S. and by Chinese, South Korean, and Indian relations with European space powers (including Russia) (Moltz, 2011, p. 78).

In keeping with this pattern, China's strategy is a combination of cooperative initiatives with the main space powers (such as extensive satellite development with the United Kingdom and France) and nurturing opportunities with lesser powers through its leadership of the Asia-Pacific Space Cooperation Organization (APSCO) (Pollpeter, 2015, p. 114). APSCO was established in 2008, and while it is a relatively new organization, its creation is the final institutionalization of an existing multilateral cooperative effort that was initiated by China more than 20 years ago in 1992 (Aliberti, 2013, p. 2). The organization has full international legal status and is a formal membership-only group with a dues paying requirement. However, although it is structurally modeled after ESA, it is far from being the equivalent due to the asymmetric capabilities China maintains in comparison to other members. For instance, to prevent dominance of the organization by a single state, Article 18 of the APSCO Convention states that no Member State shall make a financial contribution in excess of eighteen percent (18 %) of the approved budget Organization (“APSCO: Policies, Rules and Regulations,” 2015). However, this stipulation does not prevent China from leading the decision-making process of APSCO. As a result, India,

Japan, and South Korea have refrained from membership because of the imbalance in relationship with China over joint projects (Moltz, 2012, p. 32). Japan, in particular, is concerned about collaborating with China because of its blurring between civil and military projects (Pryor, 2012, PowerPoint). Thus, regional fragmentation has been partly due to China's ambitions to be a leader by supremacy, whereas Japan (as expressed by the Ministry of Foreign Affairs) approaches Asian countries as equal partners in order to foster region-wide socio-economic development (Aso, 2005).

However, as Moltz (2011) points out, despite the uncertainty within Asia towards Chinese space leadership, countries with less developed space programs tend to bandwagon with Beijing because of their promises in providing ready technological assistance (p. 75). As such, with a current membership that includes Bangladesh, China, Mongolia, Iran, Pakistan, Thailand, and Turkey, APSCO aims to promote and develop collaborative space programs, technology, research, training, respective members' space industries and contribute to the peaceful use of outer space ("APSCO: Policies, Rules and Regulations," 2015). By helping the members of developing countries improve their technical capabilities and develop their space infrastructure, China's policy has encouraged Japan to respond by pursuing a similar direction (Aliberti, 2013, p. 4). Thus, Moltz (2015) argues, "these activities reinforce the image that China can interact with the major space powers as equals while creating an alternative universe where China can lead space activities free from the interference of the other major space powers" (quoted in Pollpeter, p. 114). At the same time, Aoki (2008) notes that because the organization's members include Latin American and Middle Eastern nations, "...a sense of regional cooperation is not a conspicuous feature" (p. 66).

In contrast, JAXA continues to benefit the most from its close alliance with the U.S. and NASA. Since 1992, Japanese astronauts have participated in thirteen U.S. shuttle missions and seven of the nation's astronauts, in particular, have worked on the International Space Station (ISS) ("JAXA: Japanese Shuttle Missions," 2015). As Charles Bolden, NASA Administrator, notes, "We currently have more than 35 active agreements with JAXA in human spaceflight, Earth science, space science, and aeronautics, making Japan one of the agency's leading partners in civil space cooperation" (Braukus & Weaver, 2013). Despite being bypassed by China in some areas, Japan still has the oldest space program in the region and maintains the closest relationship with the U.S. (Moltz, 2012, p. 2).

As previously noted, this relationship was also exemplified by SSA agreements during Prime Minister Abe's visit to the U.S. in April 2015. In keeping with the Obama administration's ongoing "pivot to Asia" (or rebalance with Asia), addressing it was part of a greater U.S.-Japan strategy for dealing with China's military modernization and recent contentious behavior in the South and East China Sea. However,

cooperation in this program actually traces farther back to Obama's 2010 National Space Policy, which shifts away from unilateral leadership in space defense and highlights a renewed American receptivity to international cooperation with partners, such as Japan, in areas like SSA (Moltz, 2012, p. 205). As such, later in 2013, both nations signed a memorandum of understanding, "Space Cooperation: Space Situational Awareness Services and Information—Agreement Between the U.S.A and Japan," that permits Japan to contribute to SSA by "augmenting US and international sensor networks and helping with back-end data processing" (Pryor, 2012, p. 2). SSA collaboration has served as a means to establish new standards of noninterference and peaceful behavior in space.

With regards to regional collaboration, Japan maintains its presence through its leadership of the Asia-Pacific Regional Space Agency Forum (APRSAF), established in 1993. With its voluntary membership policy, no dues, and open framework, APRSAF focuses on enhancing space initiatives in the Asia Pacific region. Since its inception, governmental and space agency representatives from over 40 countries and regions have participated in its conferences ("APRSAF: About," 2015). Past participants have included Australia, Bangladesh, Brunei, Cambodia, China, France, Germany, India, Indonesia, Japan, South Korea, Laos, Malaysia, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, the Philippines, Russia, Singapore, Sri Lanka, Thailand, the U.S., Vietnam, as well as international space organizations, such as the U.N. Office for Outer Space Affairs (Moltz, 2012, p. 77). As it stands, APRSAF is the largest coordinating space organization in the Asia-Pacific region.

However, some observers believe that Japan's extensive cooperation with the U.S. has mitigated incentives to reach out to its neighbors. This lack of outreach is evidenced by how Japan's influence initially declined when APSCO was first established due to the benefits that China could provide to developing countries. In response, APRSAF transformed itself into a more program management structure by leading regional initiatives, such as the Sentinel Asia program in 2005 (which provides environment and disaster monitoring), Space Applications for Environment (SAFE) in 2008, and others (Aliberti, 2013, p. 3).

In conjunction, this diplomatic offensive in the region has also been supplemented by Japan's Official Development Assistance (ODA), from which Vietnam (in particular) has benefited immensely. Moltz attributes the development of this relatively new relationship between JAXA and the Vietnam Academic of Science and Technology (VAST) to China's rise in space, arguing that its actions have caused unlikely partners to form new strategic alliances (Covault, 2012). Specifically, in 2013, Prime Minister Abe announced that Japan would provide \$1 billion USD in space development assistance to Vietnam for constructing a National Space Center by 2017; the center would be used for developing and operating two radar imaging satellites (Covault, 2012). Given Japan and Vietnam's shared distrust of China, these Vietnamese spacecraft will be used to

overfly not only Vietnam but also China, and Vietnam will likely share the information with Japan (Moltz, personal communication, June 5, 2015).

Undoubtedly, China and Japan are both using soft power strategies to build respect and political influence in Asia and the world. However, even with APSCO and APRSAF's extensive projects with lesser space powers, complete region-wide space dialogue and planning remains infrequent. The truth is that both China and Japan have cooperated with major powers to acquire needed technology and with developing spacefaring states to advance their own interests in exporting technologies (Moltz, 2011, Dec.). In regards to the latter, while such initiatives are a good start, they are unlikely to result in broader cooperation and may actually continue to widen the existing regional divide between APSCO and APRSAF (Moltz, 2012, p. 206).

As a positive outcome, though, the competition for regional leadership has resulted in innovation. Before APSCO, some observers critiqued APRSAF for being a venue of mostly discussion with little action. In other words, the establishment of APSCO and its pursuit to nurture space infrastructures in developing countries forced APRSAF to raise the standard of its programs for partners. In turn, the unintended enhanced cooperation has allowed underdeveloped nations to benefit the most from the rivalry.

V. Prospects for Regional Confidence-Building Measures

One of the solutions for resolving the differences between APSCO and APRSAF, as well as encouraging broader communication and research collaboration among all regional nations, would be to combine the efforts of both organizations to form a new space agency. South Korean space analyst Doo Hwan Kim notes that an APSCO-APRSAF organization would be critical "as he sees space developments in the future leading to a struggle for the Asian space market between less-developed Asian space programs and the advanced programs in the United States, Russia, and ESA" (Moltz, 2012, p. 207). However, such an idea was proposed in 2010 and failed to progress due to APSCO and APRSAF's divided political orientation (Suzuki, 2010). Specifically, Professor Sang-Myon Rhee (2006), Seoul National University's College of Law, argues that the main obstacle towards an integration of the two entities is China's non-partnership in the Missile Technology Control Regime (MTCR), which espouses the non-proliferation of weapons of mass destruction (p. 148). Rhee (2006) elaborates that in China's case, the issue is that "there is no...line between the technology used in military missiles and that used in civilian space launch vehicles..." (p. 148). As such, APRSAF members, such as Japan, South Korea, and Australia, are reluctant in their policies towards APSCO due to its partnership with Iran (Alberti, 2013, p. 5). Although China has pledged to abide to the terms of MTCR by not transferring missile technology to rogue states, the U.S. questions Beijing's current compliance due to its lack of transparency and

unwillingness to discuss such topics (Moltz, 2012, p. 216). Thus, rather than an APSCO-APRSAF merger, it would be more conducive “to find a common ground for cooperation in space activities among Asian countries in the region and focus on it” (Aoki, 2006, p. 95).

This can be achieved by focusing on common environmental and security issues that all spacefaring nations confront through agreements on transparency and confidence building measures (TCBMs). In his 2013 speech on “Pursuing Space TCBMs for Long-Term Sustainability and Security,” Frank A. Rose (US State Department Deputy Assistant Secretary, Bureau of Arms Control, Verification, and Compliance) observed that “TCBMs are the means by which governments can address challenges and share information with the aim of creating mutual understanding and reducing tensions” (Rose, 2013). In parallel, Scott Pace (2012), Director of George Washington University’s Space Policy Institute, notes that TCBMs are helpful in avoiding the chances of accidental conflict and improving predictability, safety, and security in space for both developing and developed spacefaring states (p. 59). In particular, some opportunities for collaboration would be the creation of an international code of conduct for outer space activities, Space Situational Awareness (SSA), and Humanitarian Assistance and Disaster Relief (HA/DR) operations.

First, an international code of conduct for outer space activities would encourage “best practices” and help reduce the risk of misunderstandings and accidental conflicts by committing nations to share space policies, strategies, and procedures. Since 2008, the European Union (EU) has been leading efforts to develop such a text that would be acceptable to the greatest number of States (Rose, 2013). In 2010, the EU published a revised draft, which encouraged member states to establish “policies and procedures to minimize the possibility of accidents ... or any form of harmful interference with other States’ right to the peaceful exploration and use of outer space” (Zenko, 2011).

While in July 2015 the EU held negotiations on the code of conduct at the UN Headquarters in New York, it failed to garner the needed support due to Russo-Chinese opposition, which stemmed from their frustration with the international community not embracing their proposed Treaty on Prevention of the Placement of Weapons in Outer Space (PPWT) (personal communications with Moltz, 2015). Created in reaction to the EU drafting process not being inclusive enough, PPWT pursues the worthy objective of illegalizing the weaponization of space. However, it has been rejected by many states because it does not address ground-based ASAT testing, which reminds the world community of China’s 2007 ASAT incident (Listner & Rajagopalan, 2014).

Nevertheless, because there is still no country or group of countries that regulate space activities—just a patchwork of informal industry standards, bilateral agreements, and some UN standards, which need to be revised so that they better reflect issues in the 21st century—there is still a

need for an agreed-upon, overarching framework to enhance security. Thus, it is important for nations with advanced space programs, such as the U.S. and Japan, to leverage their international reputations to continue influencing negotiations at the UN COPUOS and to improve upon the EU's version of the international code of conduct (Zenko, 2015). However, as the EU's August 2015 negotiations proved, "A space code of conduct will be valuable to the extent it can create a consensus with other spacefaring states around the world" (Pace, 2012, p. 58). Although it will take time to acquire acceptance by other nations (such as India and China) that have not cooperated closely with U.S. civil space operations, Michael Krepon (Co-founder of the Stimson Center) proposes pursuing two parallel tracks: *ad hoc* (but informal and transparent) implementation of the EU's International Code and *ad hoc* negotiation in a UN channel. Krepon's argument for this approach is that "space deserves protective norms, and these norms will not be advanced by waiting for stragglers" (Krepon, 2015). While Krepon recognizes the authority of a UN mandate, the length of its negotiating process is cumbersome, which encourages some states to delay their commitment (Krepon, 2015). Regardless, whether via a UN or EU track, these discussions need to take place because "[s]uch communications, contacts, and norms of consultation have been almost wholly absent from Asian space relations" (Moltz, 2012, p. 17).

Second, since the launch of Sputnik in 1957, spacefaring nations have become highly dependent on satellite technologies for various applications (such as education, meteorology, and military), which has resulted in the space environment becoming increasingly congested (Hersh & Lele, 2014). Currently, over sixty countries own and operate about 1,100 active satellites in an environment where there are approximately 22,000 pieces of orbital debris (Zenko, 2011). To ensure safety and sustainability, U.S. leadership will be vital since it operates 40% of all spacecraft in orbit, maintains the Space Surveillance Network (a worldwide network of 30 space surveillance sensors) to observe objects, and monitors debris through the Joint Space Operations Center (JSPOC), which can extend its capabilities "at no cost to the international community—by warning countries and commercial space operators when their satellites are at risk from large space debris or other satellites" (Zenko, 2011). As such, even without the presence of a space governance regime, it is important for the U.S. to continue SSA data sharing initiatives to prevent debris from further increasing and to enable nations to manage risks as it helps to navigate the flotsam, avoid collisions, and improve operational resilience.

Currently, the U.S. has signed 11 SSA sharing agreements with national governments, including Germany, United Kingdom, Republic of Korea, Japan, Australia, France and others, intergovernmental organizations (such as ESA), and 47 commercial entities (Stewart, 2015). By housing hardware (radar and optical telescopes) and providing data in the future, these partnerships enhance SSA capabilities, while also

nurturing dialogue on space security issues. In particular, the Japan Space Forum contributes to SSA and orbital debris monitoring by operating two of the world's limited number of space debris observatories. The analysis directly contributes to JAXA's collaboration with NASA and JSPOC's greater space surveillance network to ensure the sustainable use of outer space and space security (Yamamoto, 2015). In general, though, to ensure that an expanded SSA network furthers TCBMs, the U.S. and its allies need to portray such an alliance as being defensively oriented and non-threatening to other nations, such as China, which could otherwise lead to hostile reactions and possibly even a space arms race (Moltz, Summer 2011, p. 22).

Third, there is a growing awareness in the region of the importance of utilizing space assets in a cooperative manner for disaster prevention and environmental monitoring. Such forms of civil cooperation in Humanitarian Assistance and Disaster Relief (HA/DR) situations helps to nurture mutual trust and confidence. The value of such cooperation was illustrated during both the 2008 Chinese earthquake and the 2011 Tohoku Earthquake and tsunami, when the U.S., Japan, and China helped each other by sharing satellite data for recovery operations (Pryor, 2012, p. 2). As such, Moltz (2012) highlights, "If Asian countries can learn to work together using space-derived data, they will be more successful in combating the common threats posed to the region by natural disasters" (p. 194). To this end, Aoki (2008) proposes forming a regional satellite monitoring system by leveraging the satellites of China, India, Japan, South Korea, and the other ten members of the Association of East Asian Nations (ASEAN), which would ultimately enhance regional TCBMs and progress towards cooperative space security (p. 66). Given how prone Asia is to natural disasters, it is in the interest of all regional stakeholders to continue developing space-based capabilities and partnerships to better predict and aid future disasters (Rose, 2013).

In summary, while collaboration between APSCO and APRSAF would require serious, coordinated efforts and is an unlikely near-term outcome, pursuing TCBMs provides another avenue for collaboration and for building trust and confidence. In agreement with Moltz, if Asian nations can rise above national differences and instead, focus on common security interests as well as leveraging space as a means to promote regional development and environmental stewardship, space may instead become an effective tool for improving Asia's regional relations.

Conclusion

If JAXA achieves its goal of a lunar landing by 2018, Japan will become the fourth nation to have sent an unmanned probe to the moon after Russia, the U.S. and China. However, this accomplishment (while impressive) will be an extension of other competitive realms, in which neighboring countries are attentively watching regional rivals in order to match or at least check their capabilities, influence and power (Moltz,

2012, p. 2). Although competition can encourage innovation, pursuing regional cooperation and collaboration via TCBMs is essential due to the current state of space activities relying on anachronistic Cold War-era agreements. In addition, increasing economic pressure may eventually encourage cooperation as Asian nations face a choice of either continuing to pay higher costs or beginning to work with rivals to share research and optimize investments (Moltz, 2011, p. 83). Since cooperation in space does not drive relations on Earth “and is more of an indicator of the state of a relationship than a critical component,” Asian nations need to overcome their national differences by focusing on common security interests and environmental challenges that they all confront (Pollpeter, 2015, p. v). Thus, whether through unilateral agreements or current regional organizations, the key to ongoing progress will be to focus on project specific cooperation first, and then work ‘backwards’ to the establishment (if needed) of a single cooperative regional body (Moltz, 2011, p. 83). Creating new forms of multilateralism to discuss a code of conduct, furthering development of a regional satellite system and SSA network, as well as supporting neighbors via HA/DR operations, will serve as stepping-stones for Asian nations to ensure that access to space remains safe and secure.

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