Science, Technology, and the U.S.–Japan Alliance

DR. ARTHUR HERMAN
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The U.S.-Japan alliance is the oldest one in Asia and for decades has been essential to the peace and security of the Pacific Rim. In diplomatic, intelligence, strategic and even military cooperation, the relationship could hardly be stronger—even though competition between two of the world’s largest and most vibrant economies has at times generated political friction.

All the same, the rise of new security challenges in the region in the past decade requires a new level of cooperation from both countries and even more of a coordinated joint response than in the past. These challenges also demand a new sector for cooperation, rooted in scientific and technological cooperation, in order to bolster defense.

On December 19, 2016, a team of security and defense experts as well as industry and government officials gathered at the Hudson Institute for a day-long conference. They considered how to increase such cooperation and assessed the opportunities and obstacles that remain to forwarding that relationship, especially given recent landmark changes in Japan’s defense policy and in its rapidly changing security environment.

There was never an emphasis on achieving consensus on any of these points. This report incorporates key insights from conference participants to give a clearer and more comprehensive picture of the future of the U.S.-Japan defense technology partnership and point the way to steps needed to encourage this increasingly important aspect of the U.S.-Japan alliance.
Since 2000, the rise of an aggressively armed China with an expansive strategy to match has been the key factor in forcing both Japan and the United States to rethink their security policy in East Asia. The China challenge by no means stands alone. The past two decades have also witnessed:

- the growing threat of a nuclear-armed and ballistic missile-wielding North Korea;
- Russia's resurgence as a military and geopolitical power, including in Northeast Asia, where long-standing territorial disputes between Tokyo and Moscow remain unresolved;
- the continually metastasizing threat of Islamic terrorism, which can impinge on the region's frontiers in South and Southeast Asia;
- increasingly dangerous threats of cyberattack and cybertheft, from advanced persistent threats (APTs) like North Korea, Russia, and China to lone wolf actors and anonymous hacking groups.

All in all, the threats add up to what is arguably the worst and most volatile security environment since the end of the Korean War—or even the end of World War II.

At the center of this threat environment, however, stands China. Vice Admiral (Ret.) Yoji Koda, in his keynote speech to the conference, brought to light important aspects of Beijing's primary strategy, generally described as anti-access/area denial (A2/AD), as it impinged on U.S.-Japan strategic cooperation.

He pointed out that although Chinese strategists do not use the term anti-access/area denial in their writings, it does capture the essence of their overall military strategy and "is a basic rationale born to justify the Chinese military buildup during the last two decades and will remain so" for another decade or more.

The term refers to a strategy for limiting the ability of the United States, particularly the U.S. Navy, to intervene in confrontations and conflicts in the Western Pacific—especially around the "first island chain" of the Kurile Islands, the Japanese archipelago and Ryukyu Islands,
Taiwan, the northern Philippines, and Borneo. China has also recently extended claims of sovereignty in the East and South China Seas.¹

All the nations that make up the first island chain and/or face onto the East and South China Seas have relied on U.S. military forces for regional security since the end of World War II. Admiral Koda and other commentators stressed that while China’s military spending has been growing at an alarming double-digit rate since 2000, the United States remains the mightiest military power in the region—indeed the world.

But there are no full-scale U.S. military bases in the region, while the bases the United States does maintain, like Okinawa in the Ryukyus and Guam in the Marianas, have remained small for strategically important reasons. China has invested in A2/AD weaponry—such as advanced anti-ship missiles, ballistic nuclear missiles, space and cyberattack capabilities that can disrupt and cripple U.S. command and control, a burgeoning attack submarine fleet, and systems aimed to counteract and eventually overtake the U.S. lead in stealth technology. If the sum of these systems can limit or even deny the United States access to the vital waterways and strategic chokepoints, like the Okinawa Straits, which command the Pacific Rim, then China’s nominal military inferiority translates into strategic superiority, such as the ability to make military operations in the Western Pacific and East Asia prohibitively costly in resources and lives.

In addition, China’s buildup of its own force-projection capabilities, such as long-range bombers, amphibious forces, and the launch of its first aircraft carrier in 2014 (with another two on the way), strongly suggest that its long-term aim is to supplant the United States as the region’s dominant military power.²

But for Admiral Koda as well as China expert and Hudson Senior Fellow Mike Pillsbury, military might is only one aspect of China’s overall grand strategy—in Pillsbury’s view, perhaps less than 10 percent.


- DR. MICHAEL PILLSBURY

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Additional aspects include gaining advanced technology transfers from the United States and other advanced industrialized countries by legitimate or illegitimate means. As Pillsbury expressed it, for the Chinese, “the best technology is what you can get from other countries and other people.” China’s aims include global economic dominance through trade and industrial might. In addition, the Chinese have an even more-grandiose strategy known as the One Belt, One Road Initiative, which aims to extend Chinese trade and routes of influence across South and Southeast Asia to the Middle East, Europe, and even Africa. China has committed to invest in the initiative in the next two decades four times the amount invested in the Marshall Plan.3

Yet there is a growing consensus within China that becoming a global hegemon also requires becoming a global military power, including developing a global military base network. The construction of naval bases in Pakistan and Mogadishu are early fruits of that effort, as are the development of aircraft carriers and means of blocking American space and cyber dominance. As Admiral Koda pointed out, should China succeed in overcoming U.S. dominance in any two or three of five vital domains—space, cyber, air, maritime, and C4ISR4—then the A2/AD strategy will have worked. In his view, China’s current goal is to weaken U.S. “intent and willingness to intervene” in the Pacific Rim region. As American influence wanes, China hopes to keep the United States out and thus see its own influence expand all the way across the Indian Ocean.

What has been the U.S. response? As indicated by Dr. William Schneider, Hudson senior fellow and longtime member of the Defense Science Board, and Dr. Andrew Krepinevich, former director of the Center for Budgetary and Strategic Assessments, the response has been twofold.


4 Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
One side of the Pentagon doctrine, known as Air-Sea Battle, was designed to defend the first island chain from Chinese attacks, and also aims to keep U.S. military assets, particularly the Fifth Fleet, out of the reach of Chinese access-denial weaponry like sophisticated anti-ship missiles. Yet as Dr. Krepinevich observed, China's A2/AD strategy puts the United States in a “very risky position in creating a forward defense posture,” including for helping Japan defend itself from future aggression. Therefore, some answer to A2/AD must be found if the United States—and Japan—are to restore the balance of security and stability in that part of the world.⁵

Even more importantly, Krepinevich emphasized, we “have to make sure that if the A2/AD regime is supplanted, it is supplanted by us.” That is the goal for what has come to be known as the third offset strategy, announced by the Pentagon in 2014, which aims “to sustain and advance America’s military dominance for the 21st century”⁶ by developing key technologies that will underpin our defense systems of the future. These include unmanned systems, robotics, miniaturization, artificial intelligence (AI), and big data, as well as advanced weapons systems such as high-energy lasers, hypersonic missile capabilities, and electromagnetic railguns.⁷

As Dr. Schneider reminded the audience, all serious technological changes in the defense sector have come in response to urgent strategic challenges. This is what happened in the first offset when, faced by the Soviet Union’s massive land and ground forces, the United States turned to its nuclear superiority to develop an arsenal that would “offset” Russia’s quantitative superiority in more conventional weaponry, including manpower. Likewise, when the Soviet Union managed to achieve nuclear parity with the United States in ballistic missiles, the Pentagon developed a second offset strategy in the 1980s built around precision-guided munitions, stealth technologies, and digitized advanced intelligence, surveillance, and reconnaissance (ISR). This neutralized the Soviets’ new quantitative edge and dominated the battlefield in Desert Storm, Iraqi Freedom, and Afghanistan.⁸

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Today, the third offset once again leverages America's technological advantages in the defense sector as a means of maintaining and extending the country's military edge. Yet the third offset's military technologies are also rapidly emerging as "exponential growth" areas in the civilian sector, and not only in the United States. This, in turn, will mean a dramatic change in both the per-cost basis and technological applications of future defense systems in ways that will mirror Moore's law, which describes how personal computers became more powerful as they became cheaper. It also means the emergence of new sources for America's future defense industrial base, many of which will be unprecedented.

These include an ally like Japan. As Admiral Koda noted, for now, “the future is still on our side by a large margin,” and not on China's. Yet “the single simple secret for successful Japan-U.S. bilateral technological cooperation is one that fully exercises each [country’s] advantages in a complementary, not competitive way.” Exploring those ways was the focus of the rest of the conference.

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THE SINGLE SIMPLE SECRET FOR SUCCESSFUL JAPAN-U.S. BILATERAL TECHNOLOGICAL COOPERATION IS ONE THAT FULLY EXERCISES EACH [COUNTRY’S] ADVANTAGES IN A COMPLEMENTARY, NOT COMPETITIVE WAY.

- VICE ADMIRAL (RET.) YOJI KODA
While the United States and Japan confront unprecedented levels of regional threat, both countries—especially Japan—are confronting “the most significant shifts in defense industrial landscapes in a generation,” a challenge that Pierre Chao of Renaissance Strategic Advisors explored.

For instance, there have been major developments in weapons systems to meet the needs of counterinsurgency strategies and the war on terror. In recent decades, warfare has suddenly become smaller and more granular and conducted in untraditional spaces, like urban centers in the Middle East and the West—most spectacularly in New York City on September 11, 2001. After this attack, a new premium was placed on advanced ISR and unmanned platforms, particularly unmanned aerial vehicles (UAVs), which deliver not only 24/7 intelligence, but also missile strikes via remote control.

The Pentagon was forced to procure equipment that had not appeared on its acquisition horizon ten years earlier, such as mine resistant armored personnel vehicles (MRAP). Additionally, commanders on the ground wanted technologies that could deal with relatively low-budget, small-scale, but highly lethal challenges like identifying and defusing improvised explosive devices (IEDs).

As the wars in Iraq and Afghanistan were reaching their climax, the risk of near-peer conflicts and threats began to loom, as China and Russia used America’s distraction with the war on terror to surge and build up their militaries to challenge the U.S.-dominated global security order. In addition, steadily mounting cyberthreats forced a major reassessment of how armed forces around the world

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could remain effective in an age of vulnerable computer networks. The weaponization of cyberspace, including in social media, poses huge challenges not only for the United States, but also for its NATO and Asian neighbors, including Japan.

By 2013, the new threat environment was approaching critical mass. The defense industry worldwide went into high gear to meet the needs of a security and military marketplace that was more complex, more diverse, more fragmented, but also more competitive than at any time in history.

At the same time, the technology underpinning defense systems was also rapidly evolving, becoming smaller, faster, lighter, cheaper, and also more available to unpredictable non-state actors like terrorist groups. The power of Moore’s law also applied to high-tech weaponry and related technologies, from advanced machine vision, modeling, and simulations, to big data analytics and 3D printing.

Not only are advanced systems like unmanned platforms becoming less expensive to design, develop, and operate; they are also becoming more readily available, especially for those prepared to take “second mover advantage” — i.e., to reap the benefits of learning from those who tackle the rigors of the learning curve first.

As Andrew Krepinevich underlined, this means that countries, like the United States, that want to maintain a technology-driven “offset” edge, need to develop and deploy the systems of the future more rapidly than ever. In short, they need quick progress now to maintain their edge later.

The third offset was conceived to reflect and take advantage of both these developments: Moore’s law–driven technological change, and the need for speed in development and deployment.

GLOBALLY PROLIFERATING TECHNOLOGIES ARE CHANGING THE MILITARY TECHNOLOGY LANDSCAPE AND SHRINKING THE TECHNOLOGY ADVANTAGE OF THE US AND EUROPE.

– PIERRE CHAO

All conference participants agreed that from the perspective of Japan’s defense technology cooperation with the United States (see section 4) and for its own self-defense (see section 3), Japan’s government and defense industry must be poised to take advantage of the same shifts. What Japan lacks in economies of scale compared to the U.S. defense establishment, and what it lacks in experience in defense industrial cooperation with other countries (including defense exports), it must make up for through agility, flexibility, and innovation. This is especially true when it seeks to partner with U.S. industry in developing and producing critical systems that will meet U.S. as well as global defense needs.

Facilitating this process is the revision of the so-called three principles regarding defense exports from Japan by Prime Minister Shinzō Abe’s government in 2014. These can be summarized as follows:

1. Transfers of defense equipment are prohibited when they a) violate obligations under treaties and other international agreements to which Japan is a signatory, e.g., the Chemical Weapons Convention, the Convention on Cluster Munitions, the Convention on the Prohibition of the Use, Stockpiling, Production, and Transfer of Anti-Personnel Mines and on their Destruction; b) violate sanctions and other obligations under UN Security Council resolutions; c) are destined for a country that is party to a conflict regarding which the UN Security Council is taking measures to maintain or restore international peace and security.

2. Transfers are permitted when they a) contribute to “the active promotion of peace” and international cooperation; b) contribute to Japan’s own security by enabling it to implement international joint development and production projects with its allies and partners; c) enhance security and defense cooperation with Japan’s allies and partners; d) support Japan Self-Defense Forces (JSDF) activities, including maintenance of equipment that enhances the safety of Japanese nationals.

3. Finally, transfers are permitted when, prior to transfer, the recipient country provides the Japanese government with appropriate formal guarantees regarding extra-purpose use and third-party transfers, and the government of Japan gives its consent.

These revisions mark a major loosening of Japan’s traditional defense-export ban, at least in theory. However, as conference participants like Steven Ganyard pointed out, some of these revisions remain problematic, such as the insistence on advance guarantees regarding third-party transfers, and might pose obstacles to doing so

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defense business with Japanese companies where none are needed.

Furthermore, Japan’s effort to increase overseas defense trade means breaking into a global marketplace long dominated by other, larger and more experienced players—not only the United States, but also France, Germany, Britain, Israel, Russia, and China, and even Canada and South Korea. Japan’s recent experience trying to sell Soryu-class submarines to Australia is an outstanding example of how challenging and frustrating this process can be for a newcomer.14

Yet as several conference participants noted, Japan brings a great deal to the defense-trade table. Pierre Chao listed several areas where Japan can offer comparative advantage: ballistic missile defense (BMD), ISR, robotics, sensors, composite materials, and even drones. Though the United States, China, and Israel seem to dominate the defense marketplace, as Chao pointed out, Japan has considerable experience in developing and deploying drones for precision agricultural use.

Another speaker, James Armington of Boeing, added the following technologies in which Japan has a great deal to offer:

- infrared search and track systems to detect small and even stealth targets
- autonomous control systems “to take over routine tasks and relieve demands on human decision-making,” an area that shades into artificial intelligence
- “lightweight composite structures that are stronger and more durable and enhance mission efficiency and effectiveness”
- the Internet of Things, e.g., smartphones and smartphone components, which can provide “an unprecedented level of awareness and adaptability in military affairs”

It is important to note that most, if not all, of these technologies are actually commercially based, yet in the age of the third offset and high-tech systems, they have enormous defense-sector applications. In fact, one of the three branches of opportunity for Japan highlighted by Pierre Chao and other participants is to allow U.S. defense companies to go directly to Japanese commercial technologies, since so many today have potential military and defense applications. Commercially based dual-use technologies represent a huge opportunity for Japan to turn its mastery of high-tech consumer goods into a defense marketplace bonanza.15

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A second branch of opportunity is indigenously developing capabilities that will attract the interest of the U.S. government, especially in third offset sectors, and present opportunities for government-to-government procurement. The third is co-development and licensed programs with U.S. companies. The current co-production F-35 program between the Japanese government and Lockheed Martin is an especially rich and promising example of this third branch, which will continue to involve numerous Japanese companies both large and small for many years to come.\footnote{Dave Mojumdar, “Get Ready, China: The F-35 Just Arrived in Japan,” National Interest, January 18, 2017, http://nationalinterest.org/blog/the-buzz/get-ready-china-the-f-35-just-arrived-japan-19096.}

This analysis, however, begs a key question. How does Japan break into this lucrative but challenging defense marketplace, including in the United States?

Pierre Chao’s advice was simple: follow the example of Robert Fulton who, when he wanted to sell the U.S. Army a steamboat, simply built one and sailed it to prove its effectiveness. In case that seems too audacious, James Armington has his own formula for future success: look to places where U.S.-Japan science and technology cooperation already exists, and try to expand that partnership into the defense sector. The example he gave was in commercial aviation, where Japanese and American industry members have built trust and close partnerships for many years, and where Japan can learn “to apply the same lessons to the defense industry where the opportunities will result in reduced defense spending and quicker ‘time to market’ on critical technologies.”\footnote{Veronica Brezina, “Japanese Businesses Seeks Aerospace Opportunities in Orlando,” Orlando Business Journal, January 19, 2017, http://www.bizjournals.com/orlando/news/2017/01/19/japanese-businesses-seek-aerospace-opportunities.html.}

Nonetheless, Japan’s defense industry will need to stretch beyond its own corporate or even national horizons. Here it can learn from Japan’s commercial sector, where foreign direct investment (FDI) and acquisition of foreign companies is standard practice as a way to gain market share.

Farhad Jalinous of White & Case LLP, one of the nation’s foremost experts on foreign investment in the United States, explained to conference goers that in inbound investment in the United States, Japan was the second largest source of foreign direct investment in 2013 and the fourth largest in 2014—virtually all in the commercial business sector. With “very few exceptions,” Jalinous noted, which “trigger review by the Committee on Foreign Investment in the United States (CFIUS),” these investments are “approved without resistance or hurdle.” This is good news for Japan’s defense sector. Japan is America’s most trusted Asian ally and a proven defense partner in the SM-3 Block IIA anti-missile missile program and the current F-35 program. Thus, Japan’s private companies should be able to receive Department of

The X-2 experimental stealth aircraft embarks on its maiden flight from Nagoya Airport on April 22, 2016 in Toyoyama, Aichi, Japan. Developed as a test bed for stealth technology planned to be incorporated in the ASDF’s next-generation fighter, the X-2 is equipped with high-powered, compact engines and is designed to be highly maneuverable.

(Photo by The Asahi Shimbun via Getty Images)
THERE ARE ALREADY A NUMBER OF JAPANESE COMPANIES IN THE FOCI PROGRAM IN THE DEPARTMENT OF DEFENSE. WE HAVE BEEN INVOLVED WITH A NUMBER OF THEM, AND IT HAS BEEN QUITE SUCCESSFUL...I DON’T EXPECT THIS TO BE IN ANY WAY CHANGING OVER THE NEXT COUPLE OF YEARS AS I THINK THAT THIS DEFENSE COLLABORATION IS GOING TO BE GROWING.

– FARHAD JALINOUS

Defense (DoD) clearance once they receive security clearance for classified work for the U.S. government.

How important is foreign direct investment in the U.S. defense sector? Britain’s BAE Systems plc has demonstrated how important—and successful—it can be through its wholly owned American subsidiary. In a few short years, BAE Systems Inc. has risen to become the eighth-largest U.S. defense contractor and has won top honors in competition for some of America’s most advanced systems, including the U.S. Navy’s electromagnetic railgun. Italy’s Leonardo (formerly Finmeccanica) bids fair to do the same.

Why not Japan?

As Dr. William Schneider has noted, foreign direct investment is essential to a sustained defense industry in today’s globalized marketplace and forms one of the pillars of what he and I have recently dubbed the “Golden Triangle” of a sound defense industrial base, alongside defense trade and industrial security. While the latter remains a challenge for Japanese defense cooperation, both technical and industrial, as we will see (in the Conclusion), compared to other Asian countries, even those with long experience in the defense marketplace, Japan is ready for liftoff.


3. How Science and Technology Cooperation Enhance Japan's Safety and Self-Defense

The issue of science and technology cooperation for self-defense has a particular importance, even urgency, for Japan. It faces three nuclear-armed neighbors—China, Russia, and North Korea—and Pyongyang is regularly testing ballistic missiles that can easily reach the Home Islands. In fact, one of these, a submarine-launched missile, recently crossed into Japan’s air-defense identification zone (ADIZ). In addition, aggressive Chinese moves in the East China Sea surrounding the Senkaku Islands, which China claims as its own, pose a regular threat. Given that these moves often involve the use of civilian fishing craft to generate or provoke an incident that China hopes to manipulate to its advantage, it is even harder to contain this threat.

Nor is the threat limited to kinetic or military action. Cyberattacks on Japan—most of them originating in China—have accelerated exponentially in recent years. In 2012, the attacks passed the 1 million mark for the first time, and in 2014, the number was 25 billion. The most current figures for cyberattacks on Japan show that they

hit a mind-boggling 128.1 billion in 2016. In addition, China has increasingly learned how to manipulate social media to plant or disseminate disinformation regarding its activities in the South China Sea and elsewhere to defuse political opposition and mislead the public.

Given the scope of the challenge, the Abe administration realized that fundamental new steps had to be taken to ensure that Japan has the right resources and equipment to protect the Home Islands from these threats and future threats. Therefore, in October 2015, the government created the Acquisition, Technology, and Logistics Agency (ATLA) within the Japan Ministry of Defense (JMoD) by merging the acquisition and procurement bureaus of the separate JSDF branches into a single streamlined organization.

The second keynote speaker of the conference, Dr. Hirokazu Hokazono, ATLA’s deputy commissioner and chief defense scientist, addressed the new agency’s mission and agenda. “If we do not adopt an appropriate defense policy, there is a risk of losing the . . . technological superiority” of the United States and Japan over potential foes, he warned.

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In addition, ATLA focuses on “promoting defense equipment and technology cooperation from the perspective of [its] promotion of peace, international cooperation, and the security of Japan,” which necessarily includes strengthening international security and defense cooperation.

The Japanese government’s Fifth Science and Technology Basic Plan states that “in order to ensure the safety and security of the nation and its citizens, it is important to make use of Japan’s many outstanding technological strengths.”

Dr. Hokazono laid out ATLA’s defense technology strategy and its three approaches to achieving this objective. The first is a technology survey, intended to collect information on Japan’s existing technology base as a foundation for developing a defense technology. The second is “optimized acquisition of defense equipment through project management” and formulating an overall research and development vision. The third step is technology protection, or providing appropriate safeguards for technology control, industrial security, and the use of intellectual property.

Finally, there also is the Technology Vision program for unmanned equipment, focused on “presenting a concept for future defense equipment and an R&D roadmap on necessary technologies for the next twenty years.” Future visionary plans include autonomous systems—such as swarm control and power supplies for underwater missions considered 4D (dangerous, dirty, dull, deep)—using unmanned platforms in support of manned systems.

ATLA envisions similar programs for AI and ICT (information and communication technology), which can have cyberattack survival skills that reach for “system of systems” integration.

But above all, Dr. Hokazono stressed Japanese cooperation with the United States on five particular technical projects:

- research on hybrid electric propulsion
- research on high-speed multi-hull vessel optimization
- development of BMD missiles, including the current SM-3 Block IIA joint project
- research on hearing loss and auditory damage caused by jet propulsion engines and other noise factors
- transfer of PAC-2 seeker gyro technology

Other panelists drew attention to additional areas where U.S. technologies can help Japan protect and defend its national territory, starting with maritime surveillance.

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Chris Pehrson of General Atomics Aeronautical Systems discussed how UAVs can become low-cost, high-value platforms for maintaining persistent surveillance in dangerous security zones close to Japan, such as the East China Sea and North Korea. His presentation demonstrated how General Atomic UAVs such as the Reaper, Guardian, and Avenger can be used to detect and track ballistic missile launches with low-apogee positioning, which, he says, allows for more precise tracking and coordination with other missile defense components, like the SM-3 Aegis cruiser or Aegis Ashore. Such a UAV can maintain a steady tactical data link (TDL) with Aegis or other BMD systems and will permit more accurate and timely interception. In addition, it will keep a TDL with Japan’s own satellite network for overall supervision.

Pehrson stressed the basic maxim to “innovate by integrating.” This means bringing together existing technologies in new combinations to transform security challenges into strategic advantages, and to offer a new frontier for government-to-government, company-to-company cooperation that can grow and expand for many years.

Dr. Leonard Caveny, former science and technology director for the Ballistic Missile Defense Organization, made the same “innovate by integrating” argument by using UAVs such as the Reaper and Avenger or Northrop Grumman’s Global Hawk as the starting point.

He noted that large, multistage rockets like ballistic missiles require high-thrust booster engines to push them out of the atmosphere, which then drop away when the missile achieves orbit. Ground- or sea-based anti-missile systems like Aegis and Terminal High Altitude Area Defense (THAAD) are designed to hit a missile during its final, or descent phase as it hurtles toward its target. However, it is better to destroy the missile in the slowest phase of the launch, the boost phase, because infrared sensors can more easily detect and identify it during this phase and do not have to overcome the missile’s greater speed later in its descent.

A boost phase intercept (BPI) would operate from a UAV stationed at 55,000 feet outside North Korean airspace. It would be armed with a conventional anti-missile missile of 225 kg with a 3.5 km-per-second velocity, giving the UAV’s operators on the ground nearly a minute to decide...
whether to intercept—more than enough time to prevent a mistake.\textsuperscript{25}

As Dr. Caveny pointed out, not only do all the technologies for such an operating BPI system exist, but they have been tested and qualified for use. Indeed, Japanese companies could take the lead in developing the system now using U.S.-built UAVs, then build the interceptor’s motors, sensors, and other components. While General Atomics and the U.S. government are currently developing a BPI using lasers, such a system could be half a decade or more in the development and testing phase. In Dr. Caveny’s estimation, it could be ready for testing in a year and a half, at minimal cost—perhaps no more than $25 million—if Japan took the technological lead.

Rajeev Sharma of ALQIMI National Security addressed U.S.-Japan technical cooperation in a more unconventional setting, namely the information domain, including media and social media.

Recent developments in Russia and China have transformed the Internet into an information battlespace where deliberate manipulation is used to disrupt, distract, and demoralize political opponents. In Russia’s case, information warfare has been successfully integrated into hybrid warfare tactics to precede or accompany kinetic operations, as in Ukraine and Crimea in 2014. China has been steadily moving in the same direction. Combined with cyberthreats, information war has become one of the most potentially dangerous and disruptive tools for aggressors, even without the possibility of armed conflict or kinetic operations.

Fortunately, big data analytics offers a way to strike back. ALQIMI has developed SIFT, which enables data collection from media and social media sources, including historical data previously collected, to identify and analyze sources of misinformation and malign influence. SIFT and similar artificial intelligence–driven systems monitor third-party media and social media use to create a rigorous threat assessment. SIFT has been used very successfully with Russian social media manipulation and was able to identify specific trolls and their networks. As Sharma pointed out, the same toolkit could be deployed

to analyze Chinese social media manipulation and its interaction with media misinformation.26

In addition, big data collection and analysis offers the opportunity to develop a counter-strategy and response to “fake news” and other information domain aggressions. SIFT can also monitor the effectiveness of the response to the counter-strategy. As Sharma indicated, big data analysis opens enormous possibilities for U.S.-Japan cooperation in developing a common information domain strategy.27 Together with cybersecurity, it may be among the most important and urgent developments in the future.

Big data and artificial intelligence, like ballistic missile defense, ISR, cyber systems, and space systems, point the way to a common U.S.-Japan defense science and technology strategy for the next generation, much of it connected to the third offset strategy, discussed in section 1.

Third offset technologies can enable Japan to enhance its security and self-defense without substantially raising the defense budget. As William Schneider reminded the conference, these technologies also make up for Japan’s graying population and the resultant personnel shortages for JSDF and other security agencies. Third offset technologies are powerful force multipliers—especially in the face of an opponent that has emphasized quantity over quality—and can provide a strategic advantage for decades.

In summary, the enormous benefits Japan will receive by gaining access to these technologies and helping to co-develop and co-produce them are evident. But what about the United States? How will the U.S. government, as well as U.S. companies, benefit from this new program of cooperation?

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For Japan, there are enormous advantages to be gained from increasing collaboration with the United States in defense technology and trade. These range from co-development with U.S. companies and manufacturing licensing with the DoD, to eventual investment in the United States, including acquiring companies as wholly owned subsidiaries on American soil.

What are the advantages for the United States?

All agree that Japan’s much-vaulted position as a high-tech industrial giant makes it an attractive partner for defense business. At the same time, conference participants stressed that Japan, as a brand-new entrant into the international defense marketplace, will need to think about and plan for several issues to attract more attention from Washington and America’s much larger and more mature defense industry. The conference brought to light many important matters that need to be addressed before the full possibilities of U.S.-Japan defense collaboration can be realized.

MANUFACTURING DOMINANCE UNDERPINS TECHNICAL DOMINANCE... WHEN WE LOOK AT IT FROM A NATIONAL SECURITY IMPLICATION, IT IS IN OUR BEST INTEREST TO DRAW CLOSER TO OUR ALLIES WHERE OUR SUPPLY CHAIN SITS.

– ADELE RATCLIFF

Adele Ratcliff, director of manufacturing technology at the DoD, described the highlights of her two visits to Japan in 2016. After meeting with key industry and government officials, she found great opportunities for cooperation,
especially at the industrial production level. At the same time, she saw the need for Japanese defense companies to develop a more innovative corporate culture, particularly in her main area of expertise, manufacturing. “Manufacturing dominance underpins technical dominance,” she pointed out, and while the defense industrial base for the United States looks far more diverse than it was a generation ago—even multinational—Japan’s remains highly insular. In addition, smaller manufacturing firms, which are often the source of key innovations, are overshadowed by the weighty larger firms and original equipment manufacturers (OEMs), which resell major company products under a separate name.28

The government has historically picked the winners in the defense industry instead of relying on high-level competition, even dividing up contracts among specific companies for reasons of politics rather than efficiency or cost competitiveness. This has also tended to limit innovation.

Ratcliff’s contacts with Japan’s research and development nexus—which incorporates ATLA, METI (Ministry of Economy, Trade, and Industry), and MEXT (Ministry of Education, Culture, Sports, Science and Technology)—also revealed significant limitations in innovation and application in the government’s own role in fostering defense research.

She noted that “there seems to be very little direct influence of ATLA on the R&D strategy with MEXT,” the agency that does almost all the basic R&D for the government. In a similar fashion, most of the research done at Japanese universities is driven by industry and commercial needs, not the needs of defense or national security. “Their total R&D investment is less than 25 percent of our DoD investment on an annual basis,” Ratcliff told the conference. “That’s their combined private and government research.” Clearly, the relationship between defense procurement and production and R&D needs new thinking in Japan.

As it stands now, significant breakthroughs in defense technology are not likely to emerge from Japan any time soon.29


The U.S. Navy variant of the F-35 Joint Strike Fighter, the F-35C, conducts a test flight over the Chesapeake Bay. (Photo by Lockheed Martin/U.S. Navy)

On the other hand, Ratcliff saw considerable grounds for optimism and also improvement. She noted the innovative culture of the up-and-coming generation, including “the young bench” at ATLA, and the interest at METI in seeing Japan’s defense-export opportunities develop and expand. Ratcliff sees many possibilities for Japanese companies to cut their defense teeth on logistics and sustainment, for example, in the Joint Strike Fighter program. In addition, she sees opportunities for the United States to help them grow the organizational
structure and corporate instincts they will need for a successful defense business culture that is customer-responsive and export-oriented.

“Focusing on using manufacturing and industrial base issues to grow our partnerships with our allies is even a recent event for us” at DoD, she admitted, “but no less important” for the United States than for Japan.

Encouraging that collaboration was the subject of a 2011 paper jointly written by the American Chamber of Commerce in Japan and the Keidanren Business Federation. James Armington stressed that although the paper was issued before the changes in Japan’s export rules, it still has enormous relevance in charting a future course for U.S.-Japan collaboration.

According to Armington, there were four basic approaches in the paper:30

- combined government-to-government research and development projects similar to SM-3 Block IIA
- single-country-led projects with multiple prime/subcontractor roles filled by both countries
- “fully commercial collaboration under policy guidelines,” in which Japanese and American companies map out their own projects in coordination with the rules of their respective governments regarding defense export and technology transfers
- licensed manufacturing, with proper protections regarding intellectual property rights and industrial security

Since then, Armington noted, “We discovered . . . it’s about creating and managing incentives.” Thus far, the Japanese defense industry still lacks many of those key incentives, while other factors continue to serve as disincentives even under the new, more-relaxed rules: reputational risk, intellectual property protections, and opportunity costs for companies that see more strategic

value for themselves in commercial projects than defense-related projects.

Steven Ganyard of Avascent, one of the country’s leading defense industrial consulting firms, drew on his long experience working in Japan to outline some of the key obstacles that still retard U.S.-Japan collaboration at the corporate level. In the end, he focused on four issues that need to be dealt with before important collaboration can move constructively forward.

First, the Japanese defense industry is not competitive in terms of cost or efficiency. Having been the happy captive of a single client, the government, Japan’s major defense companies have a corporate culture that is unresponsive to these issues, which are critical in today’s globalized marketplace.

Second—and here nearly all the American conference participants agreed—the new export policy is a change in the law but has not changed the mindset or incentives. “When the prime minister is your business development leader,” Ganyard noted sardonically, as with the Soryu submarine deal with Australia, “there’s a problem.”

IF YOU ARE A LARGE U.S. PRIME AND YOUR JAPANESE COUNTERPARTS ARE COMING TO YOU AND SAYING ‘WE WANT TO SHARE’, THERE’S REALLY NOT MUCH OTHER THAN MONEY TO INCENTIVIZE [YOU]. UNTIL JAPAN CAN BEGIN TO SHARE, PROTECT, AND COOPERATE IN WAYS THAT ENSURE BOTH INDUSTRIAL SECURITY FOR INTELLECTUAL PROPERTY [AND] FOR SECURITY OF SENSITIVE INTELLIGENCE ON THE US SIDE, THOSE INCENTIVES WILL NOT GET ANY BETTER THAN THEY ARE TODAY.

– STEVE GANYARD

Instead, Japanese defense manufacturers and contractors must realize there is a “virtuous cycle” that emerges from a vigorous entry into the defense-export market, one that includes a profit margin as much as two to ten times what the same company selling the same product in the home market can realize.31 The key to growing that opportunity, Ganyard stressed, is to reinvest those profits in internal research and development (IRAD), in the search to make “the next best thing”—whether in UAVs and unmanned systems; ballistic missile defense;

ISR and C3I (Command, Control, Communications, and Intelligence); space control and integrated space systems; or cyberdefense. This virtuous cycle will have to be the successful business model for Japanese defense companies going forward, since no company can thrive, or even survive, unless it has a strong export arm and is willing to collaborate with others in penetrating the global market.

This touched on Ganyard’s third point: Japan’s export-governing bodies, including METI and the Ministry of Foreign Affairs (MOFA), have confusing and sometimes conflicting interpretations of rules and regulations on issues like third-party technology transfers, and there is a lamentable lack of information sharing across the public-private divide and between the U.S. and Japanese governments. The term “stovepiped” came up in several conference presentations, and the lack of internal coordinating mechanisms to encourage and monitor information sharing is limiting the ability of Japanese companies to work with U.S. companies—and U.S. companies’ willingness to work with them.

Timely information sharing is just one of the benefits that can flow from a robust industrial security regime. Ganyard noted the lack of official funding in Japan for cybersecurity and industrial security, and stated that “industrial security and protection of IP must be key pillars of the future U.S.-Japan relationship.” Classification levels and a vigorous regime for personal security clearances must be developed. Aggressive cybersecurity and cybertraining is needed; industry worries that the government has not taken cybertraining seriously, even though cybertheft is the primary urgent threat to industrial security in the defense sector. The “single biggest impediment to the future of the U.S.-Japan security relationship,” Ganyard was forced to conclude, “is Japan’s lack of overarching industrial and cyber security protocols.” If Japan wants to be the sixth “I” country (to join the Five Eyes, the quintipartite intelligence alliance, whose members are Australia, Canada, New Zealand, the United Kingdom, and the United States), it will need to implement this approach.

How can Japan tackle this problem? That was the issue that Norman Pashoian, longtime administrator with the Defense Security Service (DSS) and currently with White & Case LLP, addressed in his presentation. He noted that of the 150 foreign companies working on classified contracts with the U.S. federal government that require a facility

security clearance, only 6 are Japanese. He also reminded the audience how important industrial security is for securing and maintaining DoD contracts and reviewed the key steps for passing muster under a facility clearance (FCL).

“Most foreign companies have phenomenal security programs to maintain FCL,” he pointed out, because they know that if they do not, they can have their clearances invalidated and can even lose their right to bid on contracts. A black mark on a company’s security record makes it hard to reestablish its reputation. He also noted that the DSS is moving away from its old reviews, using the regulation compliance model, toward reviews that target specific threats to specific companies. This means that for Japan, handling the cyberthreat from China moves front and center for any future DoD opportunities, and cooperation with U.S. agencies will be essential for addressing that.

In the end, nearly all the conference participants agreed with Steve Ganyard. “The industrial intelligence relationship rests on Japanese initiative,” he concluded, and “foundational blocks need to be in place [for Japan] to be a better, trusted partner and to share information and data at the highest levels of a highly classificatory industry.”

As the saying goes, in dreams come responsibilities. The dream of a strong and vibrant U.S.-Japan defense technology alliance is powerful, and in many respects overdue. But implementing that dream means responsible parties must step up and take the initiative, and that means in Tokyo as well as Washington.

All conference participants agreed on one salient point: in order for the Japan-U.S. science and technology partnership to succeed, governments of both countries will need to take the lead.

For example, Farhad Jalinous stressed that foreign direct investment needs official encouragement and leadership. To expand Japan’s opportunities for defense trade in the United States, “an extended program of defense collaboration needs to be based on a solid foundation” in which the U.S. and Japanese governments “welcome inbound investment in the U.S.”

Similarly, a solution to the problem of industrial security cannot rely on Japanese companies alone, but requires the full engagement of the government in Tokyo. As Norman Pashoian amply demonstrated, the U.S. government also needs to be heavily involved in explaining and possibly streamlining the complex FCL process for our Japanese partners.

Conclusion: A Time for Leadership and Political Will

THE SINGLE BIGGEST IMPEDIMENT TO THE FUTURE OF THE U.S.-JAPAN SECURITY RELATIONSHIP IS JAPAN’S LACK OF OVERARCHING INDUSTRIAL AND CYBER SECURITY PROTOCOLS.

– STEVE GANYARD

Likewise, Steve Ganyard told conference participants that the single biggest impediment to more U.S.-Japan cooperation is the lack of government-to-government information sharing, including sharing with relevant industry participants. The government of Japan must also push to make the new three-principles export policy an operational norm. As both Ganyard and Adele Ratcliff
emphasized, Japanese companies must embrace this as part of their regular business model because they are unlikely to develop an export policy one on their own. Nor is it likely that American companies will, on their own, encourage those Japanese companies to enter export markets, including the United States, where Japanese and American business leaders might face each other as competitors as well as partners.

At the same time, conference participants were virtually unanimous in arguing that the government of Japan must show greater leadership in pushing an effective national industrial security program. They also advocated for a cybersecurity program that can pass muster with the U.S. government and other governments, including those in NATO, looking to partner with Japan on major defense projects. In the absence of such a comprehensive program, it is unlikely that Japanese companies will be able to gain access to a rich arsenal of foreign-origin defense technologies that can be helpful to Japan’s defense industry and its self-defense.

WITH THE THIRD OFFSET STRATEGY WE CAN SEE A POSSIBILITY FOR US-JAPAN COOPERATION IN THE TECHNOLOGICAL SPHERE WHICH PROMOTES THE SECURITY OF THE UNITED STATES, AS WELL.

- DR. ARTHUR HERMAN


aerospace companies in the still-neutral United States to help them close the urgent gap between Allied and German air assets. The links London and Paris built with companies like Lockheed, North American, Martin, and Grumman—the future giants of the U.S. aerospace and defense industry—laid the foundations of what came to be known as the arsenal of democracy, which Washington then used to mobilize America’s great industrial base when war finally came after Pearl Harbor.35

If the Japanese government unilaterally handed out import licenses to individual U.S. defense companies or the DoD did the same for Japanese companies, could this lay the foundations for a similar arsenal of democracy in the twenty-first century?36 And will a defense science and technology alliance be the final missing piece in forging a U.S.-Japan “special relationship” like that between the United States and Great Britain, which won World War II? It is hard to say.

Andrew Krepinevich stressed that for any comprehensive strategy to succeed, whether it is the third offset or expanding the U.S.-Japan technology alliance, three things are needed. First, identify what you are attempting to do. Second, figure out the operational concept: What is the maximum effectiveness you can expect from deploying your strategy? Third, realistically calculate the time factor: Who can do what the fastest and the most effectively?

It is to be hoped that this conference and report have provided a conceptual framework for addressing all three issues in the U.S.-Japan technological alliance. Still, implementing a strategy to address them involves myriad concrete steps that no defense or technology company, or constellation of companies, can take by itself. Those


steps will have to be left to governments and their most important leaders.

Today those leaders are Prime Minister Abe and President Donald Trump. Like Roosevelt and Churchill, both men have achieved an extraordinary degree of personal chemistry in a very short time, and both have publicly stated that they see eye to eye on many issues, whether it is confronting the China challenge or nuclear blackmail by North Korea.38

Why not publicly and privately encourage broader defense trade and industrial cooperation? Such a strategy can be a win-win for both countries. One benefit would be economic: a booming export business for Japanese defense companies would contribute to Japan’s GDP, while Japanese direct investment in the United States would save old jobs in existing defense plants and generate new jobs in reopened or brand-new ones. There are fiscal benefits to developing third offset technologies that are more versatile in their uses but also include key strategic benefits in a volatile and uncertain East Asia.

In President Trump’s first speech before Congress on February 28, he stressed that the two pillars of his economic policy will be “buy American, and hire American.” A strong U.S.-Japan defense trade and industrial alliance can advance both pillars, while making both countries safer, stronger, and more secure.39

Conference participants also agreed that unless concrete steps are taken now to forge that defense technology alliance, and unless obstacles and impediments are addressed now, the opportunities will slip further and further way—while the threats to both nations grow more real.

As Thomas Schelling wrote more than fifty years ago, in today’s global security environment, “neither strength nor good will procures immunity” from the threat of violence, coercion, and blackmail.40 Only effective deterrence can do that, which rests on the right technologies, developed and deployed in the right way at the right time. That is the ultimate goal of U.S.-Japan technological alliance: safety and security for both, and peace for all.


40 Thomas Schelling, Arms and Influence (New Haven: Yale University, 1966).
## LIST OF NAMES AND ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>4D</td>
<td>Dangerous, Dirty, Dull, Deep</td>
</tr>
<tr>
<td>A2/AD</td>
<td>Anti-Access/Area Denial</td>
</tr>
<tr>
<td>ADIZ</td>
<td>Air Defense Identification Zone</td>
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<tr>
<td>AI</td>
<td>Artificial Intelligence</td>
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<tr>
<td>APT</td>
<td>Advanced Persistent Threat</td>
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<tr>
<td>ATLA</td>
<td>Acquisition, Technology, and Logistics Agency</td>
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<tr>
<td>BMD</td>
<td>Ballistic Missile Defense</td>
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<tr>
<td>BPI</td>
<td>Boost Phase Intercept</td>
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<tr>
<td>C3I</td>
<td>Command, Control, Communications, Intelligence</td>
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<tr>
<td>C4ISR</td>
<td>Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance</td>
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<tr>
<td>CFIUS</td>
<td>Committee on Foreign Investment in the United States</td>
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<td>DoD</td>
<td>Department of Defense</td>
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<td>DSS</td>
<td>Defense Security Service</td>
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<td>FCL</td>
<td>Facility Clearance</td>
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<td>FDI</td>
<td>Foreign Direct Investment</td>
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<td>FOCI</td>
<td>Foreign Ownership, Control, or Influence</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>IED</td>
<td>Improvised Explosive Device</td>
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<tr>
<td>IRAD</td>
<td>Internal Research and Development</td>
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<tr>
<td>ISR</td>
<td>Intelligence, Surveillance, and Reconnaissance</td>
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<td>JMoD</td>
<td>Japan Ministry of Defense</td>
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<td>JSDF</td>
<td>Japan Self-Defense Forces</td>
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<td>METI</td>
<td>Ministry of Economy, Trade, and Industry</td>
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<td>MEXT</td>
<td>Ministry of Education and Culture</td>
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<tr>
<td>MOFA</td>
<td>Ministry of Foreign Affairs</td>
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<tr>
<td>MRAP</td>
<td>Mine Resistant Armored Personnel vehicle</td>
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<tr>
<td>OEM</td>
<td>Original Equipment Manufacturer</td>
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<tr>
<td>TDL</td>
<td>Tactical Data Link</td>
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<tr>
<td>THAAD</td>
<td>Terminal High Altitude Area Defense</td>
</tr>
<tr>
<td>UAV</td>
<td>Unmanned Aerial Vehicle</td>
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<tr>
<td>UUV</td>
<td>Unmanned Underwater Vehicle</td>
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Dr. Arthur Herman and Lewis Libby were co-directors of the symposium on Science, Technology, and the U.S.-Japan Alliance, held at the Hudson Institute on December 19, 2016. They would especially like to thank Vice Admiral (Ret.) Yoji Koda and Dr. Hirokazu Hokazono, who came from Japan to provide the keynote remarks. They would also like to thank Dr. William Schneider; Dr. Andrew Krepinevich; Dr. Len Caveny; Chris Pehrson; Rajeev Sharma; Joshua Goldsberry; Dr. Michael Pillsbury; James Schoff; Pierre Chao; Farhad Jalinous; Adele Ratcliff; James Armington; Norman Pasholian; and Steve Ganyard. The insights of all the participants have shaped this report and contributed immensely to the discussion on advanced technological cooperation between the United States and Japan. Thanks are also due to Idalia Friedson, who edited the report and compiled visual and textual elements, and Mark Ashby and Mark Yokoyama, who assisted with gathering images, pull quotes, and footnotes.
Dr. Arthur Herman, Conference Co-Director
Senior Fellow, Hudson Institute

Dr. Arthur Herman (PhD, Johns Hopkins University, 1985) is the author of eight books, including the New York Times bestselling How the Scots Invented the Modern World (2001); the Pulitzer Prize finalist Gandhi and Churchill (2008); To Rule the Waves: How the British Navy Shaped the Modern World (nominated for the UK’s Mountbatten Prize); and the highly acclaimed Freedom’s Forge: How American Business Produced Victory in World War II, which the Economist picked as one of the best books of 2012. His most recent work, Douglas MacArthur: American Warrior, was published by Random House in June of 2016. His previous book, The Cave and the Light: Plato versus Aristotle and the Struggle for the Soul of Western Civilization, was published by Random House in 2013. Educated at the University of Minnesota and Johns Hopkins University in history and classics, Dr. Herman is a frequent contributor on defense, energy, and technology issues to Commentary magazine, the New York Post, the Wall Street Journal, and National Review, where he is a contributing editor. He was also the first non-British citizen to be named to the Scottish Arts Council, from 2007 to 2009.
Lewis Libby, Conference Co-Director
Senior Vice President, Hudson Institute

Lewis Libby, as Senior Vice President of Hudson Institute, guides the Institute’s program on national security and defense issues, devoting particular attention to U.S. national security strategy, strategic planning, the future of Asia, the Middle East, and the war against Islamic radicalism. Before joining Hudson, Libby held several high-level positions in the federal government related to his current work on national security and homeland security affairs. This included roughly a dozen years working in the White House, the U.S. Department of Defense, and the U.S. Department of State. From 2001 to 2005, Libby served as Chief of Staff to Vice President Richard B. Cheney, Assistant to the Vice President for National Security Affairs, and Assistant to the President. In these roles he attended nearly all National Security Council and Homeland Security Council meetings and participated in numerous high-level meetings, at home and abroad, with foreign government and U.S. officials. From 1998–99, Libby served as Legal Advisor to the U.S. House of Representatives Select Committee on U.S. National Security and Military/Commercial Concerns with the People’s Republic of China, commonly known as the Cox Committee. The committee issued a unanimous, bipartisan multi-volume report in 1999. From 1989 to 1993, during the George H. W. Bush administration, Libby served in the U.S. Department of Defense as Principal Deputy Under Secretary (Strategy and Resources), and later was confirmed by the U.S. Senate as Deputy Under Secretary of Defense for Policy. From 1982 to 1985 he served in the Department of State as Director of Special Projects in the Bureau of East Asian and Pacific Affairs. During these years, he had extensive experience with U.S. national security issues relating to Asia. Prior to joining the George W. Bush administration, Libby served as the managing partner of the Washington, D.C. office of international law firm Dechert LLP.

Vice Admiral (Ret.) Yoji Koda
Vice Admiral (Ret.), Japanese Maritime Self-Defense Forces (JMSDF) and former Director-General of the Operations and Plans Department in the Maritime Staff Office, Tokyo

Vice Admiral Koda is a graduate of the Japan Defense Academy (1972), JMSDF Staff College, and the U.S. Naval War College. As a surface officer, he took command of JS Sawayuki (DD-125), Destroyer Flotilla Three, and Fleet Escort Force at sea. His shore duty includes Director General (DG) for Plans and Operations, Maritime Staff and DG Joint Staff, as well as Commandant JMSDF Sasebo District. He retired from JMSDF as Commander-in-Chief, Self-Defense Fleet, in 2008. He was then invited to Harvard University’s Asia Center, where he was a research fellow on Chinese naval strategy from June 2009 to July 2011. He is a prolific writer on maritime affairs and military history. His recent articles include “The Russo-Japanese War: Primary Causes of Japanese Success” (U.S. Naval War College); “A Japanese Perspective on China’s Rise as a Naval Power” (Harvard Asia Quarterly); and “A New Carrier Race? Strategy, Force Planning and JS Hyuga” (U.S. Naval War College). He contributed to Refighting the Pacific War: An Alternative History of World War II (U.S. Naval Institute Press) and Maritime Strategy and National Security in Japan and Britain (Global Oriental). He served as an advisor to the National Security Secretariat of the government of Japan until March 2016.
Dr. Hirokazu Hokazono
Deputy Commissioner and Chief Defense Scientist, Acquisition, Technology, and Logistics Agency (ATLA), Japan

Dr. Hirokazu Hokazono was appointed Deputy Commissioner and Chief Defense Scientist at ATLA in October 2015. In 1981, Dr. Hokazono joined the Japan Defense Agency, which in 2007 was reorganized as the Japan Ministry of Defense (JMoD). He was assigned to the Technical Research and Development Institute (TRDI) and was engaged in research and development on defense equipment pertaining to guided missile systems such as infrared sensors, and firing control. In 2009, he was named Director of the Technology Policy Planning Division, Bureau of Finance and Equipment in JMoD, which included a focus on international technology cooperation with foreign countries. Dr. Hokazono was appointed Director General for Technology, Minister’s Secretariat in September 2013. As Director General for Technology, he was responsible for providing advice from a technical perspective on formulating JMoD’s research and development strategy and other related government policies, as well as relevant decision-making. Dr. Hokazono studied electrical engineering at Keio University and obtained his doctorate in 1992.

James Armington
Vice President, Global Sales and Marketing–Japan, Boeing Defense, Space & Security

Jim Armington is Vice President for Japan, Global Sales, Boeing Defense, Space & Security (BDS), with responsibility for strategy and execution of major BDS sales campaigns in Japan. Armington was formerly Vice President for the East Asia Pacific region under BDS International Business Development. Prior to serving in this regional role, he was BDS Director for Business Development in Japan, where he was based in Tokyo and also served in a leadership role for the American Chamber of Commerce in Japan. Prior to joining Boeing in 2010, Armington was Vice President of Raytheon International, Inc. in Tokyo, Japan, and the regional executive for North Asia and India. Before Raytheon, Armington served for twenty years in the U.S. Air Force, retiring as a Lt. Col. Armington is a distinguished graduate of the U.S. Air Force Academy, where he received a bachelor of science degree in physics. He also holds a master’s degree in International Public Policy from Johns Hopkins University, School of Advanced International Studies (SAIS) and is a graduate of the Defense Language Institute, with a qualification in Japanese language.
Dr. Len Caveny
Aerospace Consultant, former Director of Science & Technology, Ballistic Missile Defense Organization

Leonard H. Caveny has engineering degrees from the Georgia Institute of Technology and the University of Alabama. In the 1950s, after attending college on an NROTC scholarship, he served as a line officer on a destroyer operating in the Mediterranean and the Middle East. During the 1960s, he led rocket-propulsion projects for the Thiokol Corporation. In the 1970s, he supervised graduate-student research in combustion and propulsion at Princeton University. During the 1980s and 1990s, he initiated and managed aerospace science and technology endeavors for the Department of Defense. Since retiring in 1997 as the Ballistic Missile Defense Organization’s Director of Science & Technology, he sustains and initiates aerospace research and development through Caveny Tech, LLC. Acknowledgments of his contributions include Fellow, American Institute of Aeronautics and Astronautics (AIAA); Lifetime National Associate of the National Academies; Yuri Gagarin Medal, Russian Space Federation; and AIAA Wyld Propulsion Medal. He has hands-on experience with several aspects of missile defense.

Pierre Chao
Founding Partner, Renaissance Strategic Advisors

Mr. Chao is a founding partner of Renaissance Strategic Advisors and a co-founder of Enlightenment Capital. He has three decades of expertise in aerospace/defense strategy management consulting, investment banking, equity analysis, investing, and policy analysis. From 2003–07, Mr. Chao was the Director of Defense-Industrial Initiatives at the Center for Strategic and International Studies (CSIS), a Washington, D.C.–based, non-partisan defense and foreign policy think tank, where he remains as a Senior Associate. Before joining CSIS, Mr. Chao was a Managing Director and Senior Aerospace/Defense Analyst at Credit Suisse First Boston. During his Wall Street career, Mr. Chao’s team was ranked #1 by Institutional Investor every year it was eligible. He is also a guest lecturer at the National Defense University and the Defense Acquisition University, has served on several Defense Science Board task forces, and was a member of the Defense Business Board (2010–13). He holds the right to use the Chartered Financial Analyst designation and holds a Series 79 license. Mr. Chao earned dual bachelor of science degrees, in political science and management science, from MIT.
Steve Ganyard
President, Avascent Global Advisors

Steve Ganyard is President of Avascent Global Advisors, the senior-level advisory arm of Avascent, a strategy and management consulting firm serving clients in government-driven industries. He is a Founding Director of Global Shale Partners, an investment and advisory firm focused on North American unconventional oil and gas and related sectors. Additionally, he is a co-founder of China Beige Book™. He is also an Emmy-nominated, on-air contributor at ABC News for political-military and aviation issues. In government service, Mr. Ganyard served as Deputy Assistant Secretary of State in the Bureau of Political-Military Affairs. In this position, he was responsible for a budget of more than $5 billion related to global political-military security programs and served as the primary interface between the Departments of State and Defense. Previously, he served as Chief of Staff to the Counselor to the Secretary of State. He received a Department of State Superior Honor Award for his service. In the Marine Corps, he served as the Military Assistant to the Deputy Secretary of Defense and in the Joint Chiefs of Staff. As a fighter pilot, Mr. Ganyard received two decorations for combat valor. A graduate of Northwestern University and Johns Hopkins School of Advanced International Studies (SAIS), Mr. Ganyard has published articles and opinion pieces in the New York Times and other publications and professional journals. He is a member of the Bretton Woods Committee, and also serves as a consultant to the Institute for Defense Analyses.

Joshua Goldsberry
Principal Data Scientist, ALQIMI

Joshua Goldsberry is a Principal Data Scientist and SIFT Architect for ALQIMI. Mr. Goldsberry has thirteen years of experience working in the U.S. military, the government, and the intelligence communities. He is a noted subject-matter expert in the fields of counter-intelligence, counter-terrorism, and data analytics and visualizations. Mr. Goldsberry holds a master’s in intelligence analysis and a bachelor’s degree in Middle Eastern studies from American Public University (Virginia).
Farhad Jalinous
Partner, White & Case LLP

Farhad Jalinous is a partner in the Global International Trade and Global Mergers & Acquisitions practices of White & Case LLP. In addition, he heads the firm’s National Security and CFIUS (Committee on Foreign Investment in the United States) practice. His experience includes negotiating some of the most complex and sensitive national security agreements approved by the U.S. government. In particular, he represents clients in national security reviews before CFIUS and several U.S. government agencies—including the Department of Defense, the Department of Energy, and other cognizant security agencies—with respect to mitigation of foreign ownership, control, or influence (FOCI) under the applicable national industrial security regulations. Mr. Jalinous has represented clients from all over the world and routinely represents companies in all stages of the CFIUS process. These include deal structuring and other strategic planning; negotiating purchase agreement terms to ensure client protection; conducting due diligence to assess potential areas of national security concern; developing strategies for engaging the government and facilitating a smooth process; preparing CFIUS filings and managing follow-up inquiries; negotiating CFIUS mitigation requirements; and guiding companies through mitigation implementation. He is consistently recognized by Chambers USA and Chambers Global as one of the top-tier CFIUS practitioners in the U.S. legal market. Mr. Jalinous is often quoted in prominent publications including the Wall Street Journal, the Financial Times, the American Law Daily and the Daily Deal.

Dr. Andrew Krepinevich
President and CEO, Solarium LLC

Dr. Andrew F. Krepinevich, Jr. is a Distinguished Senior Fellow at the Center for Strategic and Budgetary Assessments (CSBA), which he founded in 1995. He assumed this position in March 2016 after serving for twenty-one years as CSBA’s President, prior to which he served for twenty-one years in the U.S. Army. He also serves as President and CEO of Solarium LLC. Dr. Krepinevich has served in the Department of Defense’s Office of Net Assessment and on the personal staff of three secretaries of defense. He has also served as a member of the National Defense Panel, the Defense Science Board Task Force on Joint Experimentation, and Secretary of Defense Robert Gates’s Defense Policy Board. He currently serves as chairman of the Chief of Naval Operations Executive Panel and on the Advisory Council of Business Executives for National Security. Dr. Krepinevich recently published The Last Warrior: Andrew Marshall and the Shaping of Modern Defense Strategy, which he co-authored with Barry Watts. His other recent book is titled 7 Deadly Scenarios: A Military Futurist Explores War in the 21st Century. A graduate of West Point, Dr. Krepinevich holds an MPA and PhD from Harvard University. He is a member of the Council on Foreign Relations.
Norman Pashoian
Industrial Security Consultant, White & Case LLP

Norman Pashoian, an Industrial Security Consultant in White & Case LLP’s National Security and CFIUS (Committee on Foreign Investment in the United States) practice, provides non-legal strategic advice on compliance with Department of Defense and Department of Energy industrial security regulations. His focus is on matters of foreign ownership, control, or influence (FOCI) as they pertain to U.S. government contractors, including FOCI mitigation arrangements. Mr. Pashoian also has broad experience in compliance matters pertaining to industrial security regulations, including facility security and personnel security clearance matters. He served for seventeen years with the Defense Security Service (DSS) of the Department of Defense, including as Deputy Inspector General (Industrial Security). During his tenure with DSS, he was a member of the professional staff of DSS Headquarters, with assignments to the International Security, FOCI, and Special Access Programs divisions. He also served as a security inspector for five years in the greater Boston area.

Chris Pehrson
Vice President for Strategic Development, General Atomics Aeronautical Systems, Inc.

As Vice President for Strategic Development at General Atomics Aeronautical Systems, Inc. (GA-ASI), Chris is responsible for sustaining and growing lines of business for the company’s remotely piloted aircraft, sensor payloads, and other mission system solutions. He develops business strategy and leads a team of business development professionals to provide the Department of Defense and other customers with extremely effective, reliable, and affordable capabilities. Prior to joining GA-ASI in 2010, Chris served in the U.S. Air Force, retiring as colonel. During his military career, he commanded two squadrons and an operations group and completed staff tours at Headquarters Air Force and the Office of the Secretary of Defense. As a pilot and Electronic Warfare Officer, he flew over 3,500 hours in the F-111, EF-111, C-130, and non-standard aviation aircraft, including the King Air 350, Cessna Caravan, and Mi-17. He flew over 400 combat hours, and his military decorations include the Defense Superior Service Medal, Legion of Merit, Distinguished Flying Cross, Bronze Star, and eleven Air Medals. Chris holds a bachelor’s degree in computer science from the University of Michigan, a master’s degree in computer information systems from Boston University, and a master’s degree in logistics from the Air Force Institute of Technology. He is also a graduate of the U.S. Army Command and General Staff College and the Air War College.
Dr. Michael Pillsbury
Senior Fellow and Director of the Center for Chinese Strategy, Hudson Institute

Michael Pillsbury is a distinguished defense policy advisor, former high-ranking government official, and author of numerous books and reports on China. During the Reagan administration, Pillsbury was Assistant Under Secretary of Defense for Policy Planning and was responsible for implementation of the program of covert aid known as the Reagan Doctrine. While at the RAND Corporation, Pillsbury published articles in *Foreign Policy* and *International Security* recommending that the United States establish intelligence and military ties with China. The proposal, publicly commended by Ronald Reagan, Henry Kissinger, and James Schlesinger, later became U.S. policy during the Carter and Reagan administrations. Under President George H. W. Bush, Pillsbury was Special Assistant for Asian Affairs in the Office of the Secretary of Defense, reporting to Andrew W. Marshall, Director of Net Assessment. Pillsbury is a member of the Council on Foreign Relations and the International Institute for Strategic Studies. He is the author of *China Debates the Future Security Environment* (NDU Press, 2000) and *The Hundred-Year Marathon: China’s Secret Strategy to Replace America as the Global Superpower* (Henry Holt, 2015), as well as editor of *Chinese Views of Future Warfare* (NDU Press, 1998). Pillsbury was educated at Stanford University (BA in history with honors in social thought) and Columbia University (MA, PhD).

Adele Ratcliff
Director of Manufacturing Technology, U.S. Department of Defense

Adele Ratcliff is currently the Director of International Manufacturing & Innovation within the Office of the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy. She has focused on building strong interagency partnerships to address broad transition of manufacturing issues, such as manufacturing readiness and the advanced manufacturing enterprise, most recently as Director of the DoD Manufacturing Technology (ManTech) Program and the DoD’s national Institutes for Manufacturing Innovation (IMIs), outlined in the President’s 2013 State of the Union address and now known as Manufacturing USA Institutes. Ms. Ratcliff was Program Manager for the congressionally mandated Defense Acquisition Challenge Program and Deputy Program Manager for the Foreign Comparative Test Program. She spent more than eleven years in Air Force Test and Evaluation at Eglin Air Force Base in Florida. Ms. Ratcliff earned an MS from the U.S. Navy War College and a BS in mechanical engineering from Mississippi State University. She graduated from the Defense Senior Leadership Development Program (DSLDP) of the Department of Defense. She received the SECDEF Award for Excellence for her support of the Pilot Institute for Additive Manufacturing in March 2013.
Dr. William Schneider
President, International Planning Services, Inc. and Senior Fellow, Hudson Institute

William Schneider, Jr. is President of International Planning Services, Inc., a Washington, D.C.-based international trade and finance advisory firm, and a Senior Fellow of the Hudson Institute. He was formerly Under Secretary of State for Security Assistance, Science and Technology (1982–86). He served as Associate Director for National Security and International Affairs at the Office of Management and Budget (1981–82) prior to being nominated as Under Secretary by the President. In addition, Dr. Schneider serves as an advisor to the U.S. government in several capacities. He currently serves on the Department of State's Defense Trade Advisory Group and is a member of its Arms Control and Non-Proliferation Advisory Board. He served as Chairman of the President's General Advisory Committee on Arms Control and Disarmament from 1987 to 1993, and has served on the Defense Science Board since 2001. Dr. Schneider received his PhD from New York University in 1968. He is a member of the American Economic Association, the Econometric Society, the Council on Foreign Relations, and the International Institute for Strategic Studies.

James L. Schoff
Senior Fellow, Asia Program, Carnegie Endowment for International Peace

James L. Schoff is a Senior Fellow in the Carnegie Asia Program. He focuses on U.S.-Japan relations and regional engagement, Japanese politics and security, and the private-sector role in Japanese policymaking. He previously served as Senior Advisor for East Asia Policy at the U.S. Office of the Secretary of Defense and as Director of Asia Pacific Studies at the Institute for Foreign Policy Analysis (IFPA). At the Defense Department, Mr. Schoff was responsible for strategic planning and policy development for Japan and the Republic of Korea. His publications include Uncommon Alliance for the Common Good: The Post–Cold War U.S.-Japan Experience and Future Path (Carnegie, forthcoming), What Myanmar Means for the U.S.-Japan Alliance (Carnegie, 2014), and Tools for Trilateralism: Improving U.S.-Japan-Korea Cooperation to Manage Complex Contingencies (Potomac Books, 2005). Schoff earned an MA from Johns Hopkins School of Advanced International Studies (SAIS) and a BA in Japanese history from Duke University (and spent a year at International Christian University in Japan).
Mr. Sharma is the founder, CEO, and Chairman of the ALQIMI Group of companies, including ALQIMI Analytics and Intelligence and ALQIMI National Security. Mr. Sharma has over twenty-five years of experience in the information technology industry. Since he founded ALQIMI in 1997, it has repeatedly proven its capabilities in complex cybersecurity, big data, application development, and system integration environments. These capabilities have been demonstrated with high-demand clients such as the U.S. intelligence community and military health and commercial enterprises. Mr. Sharma established ALQIMI Analytics & Intelligence and SIFT in 2014 and subsequently focused the company’s product-development effort on building a sophisticated, versatile, money-saving, cloud-deployed big data software tool. These efforts have resulted in the commercial launch of SIFT. Prior to founding ALQIMI, Mr. Sharma enjoyed a successful career at IBM. During his tenure, he quickly established himself as a future young IBM executive by leading the organization’s efforts with some of its highest-profile federal government customers such as the FBI, the Department of Justice Criminal Division, and the Immigration and Naturalization Service.
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