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Prospects for the Future of the U.S.-Japan Science and Technology Relationship

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Abstract

This article demonstrates the significance of U.S.-Japan collaboration across the space, science, and technology sectors. It offers an overview of U.S.-Japan science and technology (S&T) relations over the years, showing how the relationship has grown from its formalization in 1988 to include policy coordination on issues like research and development (R&D) projects and space exploration as well as top-level cooperation on critical and emerging technologies, such as artificial intelligence and quantum information science. This article identifies opportunities to expand the U.S.-Japan S&T relationship to address strategic questions and regional issues such as China's technological rise and shows how deep U.S.-Japan cooperation on S&T issues benefit society beyond the national security policy space, including expanded soft power and a larger innovation sector in both countries. The author draws on his experience in science and technology policymaking and his knowledge of the U.S.-Japan relationship to offer a unique perspective on this important track of the U.S.-Japan relationship.

Prospects for the Future of the U.S.-Japan Science and Technology Relationship

Introduction

The relationship between the United States (U.S.) and Japan has brought national security and economic benefits to citizens in both countries for over sixty years, rooted in decades of trust and reciprocity. The U.S.-Japan relationship has expanded over the years to include science and technology (S&T) cooperation. This emerging component of the relationship will play a key role in addressing regional security issues, such as China's technological rise, and will be an important part of strengthening the economic and cultural relationship that exists between Washington and Tokyo on issues across the science, technology, and space sectors.

History of U.S.-Japan Science and Technology Relations

The U.S. and Japan have been treaty allies since the signing of the Treaty of Mutual Cooperation and Security between the United States and Japan in 1960, and the relationship between both countries has expanded to include many areas outside of the traditional security scope, including science and technology cooperation. Collaboration on S&T issues between the U.S. and Japan began soon after the security treaty was signed. The National Science Foundation set up its first overseas office in Tokyo in 1961,[1] and several S&T and space-related, issue-specific cooperation groups and programs were established throughout the 1960s and 1970s.[2]

As U.S.-Japan economic competition reached its zenith in the 1980s, the U.S. and Japan found common ground on science and technology cooperation despite Japanese export restrictions on some technologies,[3] Japanese dumping of semiconductors into the U.S. market, and retaliatory American tariffs on Japanese goods.[4] In 1988, U.S. President Ronald Reagan and Japanese Prime

[1] James L. Schoff, "U.S.-Japan Technology Policy Coordination: Balancing Technonationalism with a Globalized World" (working paper, Carnegie Endowment for International Peace, Washington, DC, June 2020), 10.

[2] Schoff, "U.S.-Japan Technology Policy Coordination," 10.

[3] Henry Scott Stokes, "Japanese Decide to Permit Export of Military Technology to the U.S." *New York Times,* January 15, 1983, https://www.nytimes.com/1983/01/15/world/japanese-decide-to-permit-export-of-military-technology-to-the-us.html.

[4] James Gerstenzang, "100% Tariff Put on Some Japan Goods: Reagan Move to Halt Chip Dumping Could Double TV, Computer Prices," *Los Angeles Times,* April 18, 1987, https://www.latimes.com/archives/la-xpm-1987-04-18-mn-1024-story.html.

Minister Noboru Takeshita formalized nonmilitary S&T relations between both countries when they signed the U.S.-Japan Science and Technology Agreement.[5] This agreement outlines S&T cooperation in areas of national importance and established the joint high-level committee (JHLC) to address S&T cooperation.[6] The agreement was extended for an additional ten years in 2014[7] and continues to set the framework for today's government-to-government S&T relationship, including the ministerial-level JHLC, where science and technology ministers meet to address emerging S&T issues, and the joint working-level committee (JWLC) meeting, where policymakers build working-level ties and plan the next JHLC. Consequently, through the new two-tracked format of JHLC meetings, S&T cooperation between the U.S. and Japan has grown to include collaboration on space-related issues, R&D projects, and high-level coordination on emerging technologies, such as artificial intelligence (AI) and quantum information science (QIS).

Science Relations

The 14th JHLC Meeting on Science and Technology Cooperation between the U.S. and Japan met at the White House on May 2, 2019, and was the first such meeting to feature two tracks: one on science and one on technology-specific collaboration. The science track emphasized the long-standing relationship between the U.S. and Japan on various issues, including the collaboration on high energy particle physics, advanced computing, plasma research, cancer biology, neuroscience, and natural disaster resiliency.[8] Recent developments show how the whole-of-government approach for S&T cooperation between the U.S. and Japan has continued for decades. For example, the U.S. Department of Energy invested $6 million for collaborative research with Japanese researchers in high energy physics[9] at Fermi National Accelerator Laboratory and the Japan Proton Accelerator

[5] Japan Science and Technology Agreement (1988). June 20, 1988. The full text is available at https://tcc.export.gov/Trade_Agreements/All_Trade_Agreements/exp_005581.asp.

[6] Ronald Reagan, "Remarks on Signing the Japan United States Science and Technology Cooperation Agreement," June 20, 1988. *The American Presidency Project.* https://www.presidency.ucsb.edu/documents/remarks-signing-the-japan-united-states-science-and-technology-cooperation-agreement.

[7] Japan Ministry of Foreign Affairs, "Extension of the Agreement between Japan and the US on Cooperation in Research and Development in Science and Technology," press release, April 23, 2014. https://www.mofa.go.jp/press/release/press22e_000015.html.

[8] Joint Statement: Joint High Level Committee Meeting on Science and Technology Cooperation between the Government of the United States of America and the Government of Japan, May 2, 2019 at the White House, https://www.mofa.go.jp/files/000475056.pdf.

Research Complex, and scientific cooperation continues between the U.S. and Japan in the Cooperative Cancer Research Program.[10] Continued joint research on these important topics is just one way that the U.S.-Japan science partnership helps develop scientific breakthroughs, medical cures, and advanced research that will benefit both countries in the long term.

Technology Relations

Emerging technology's growing importance as a part of U.S.-Japan relations was evident at the 2019 JHLC as this meeting was the first with a new technology track, led by the U.S. Deputy Chief Technology Officer. The technology track emphasized coordination on "industries of the future" such as AI and QIS, collaboration at future summits, and cooperation on other issues.[11] Both countries have remained committed to these principles, notably by signing the recommendations for Global AI Principles of the Organization for Economic Cooperation and Development (better known as the OECD), which includes respecting the rule of law, human rights, and democratic values.[12] Outside of multilateral organizations, the U.S. and Japan have deepened bilateral cooperation on QIS. The 2019 "Tokyo Statement" on Quantum Collaborations[13] recognizes both countries embarking on good-faith cooperation underpinned by shared values, such as freedom of inquiry and merit-based cooperation while protecting intellectual property, and should help deepen U.S. and Japanese quantum cooperation in the future. As the U.S. and Japan seek to lead the development and implementation of emerging technologies, increased investment in AI and quantum technologies in the private and public sector should continue. U.S. support for Japan's moonshot R&D initiative should also see deeper quantum cooperation between Washington and

9 Department of Energy Office of Science, "DOE to Provide $6 Million for U.S.-Japan Cooperative Research in High Energy Physics," press release, October 10, 2020, https://www.energy.gov/science/articles/doe-provide-6-million-us-japan-cooperative-research-high-energy-physics.

10 "US-Japan Cooperative Medical Science Program Organization and History," NIH.gov, last updated March 17, 2016, https://www.niaid.nih.gov/research/us-japan-cooperative-program-organization-history.

11 Joint Statement: Joint High Level Committee Meeting on Science and Technology Cooperation between the Government of the United States of America and the Government of Japan. May 2, 2019 at the White House, https://www.mofa.go.jp/files/000475056.pdf.

12 "What are the OECD Principles on AI?" OECD, accessed March 16, 2021, https://www.oecd.org/going-digital/ai/principles/.

13 White House Office of Science and Technology Policy, "U.S. and Japan Sign Landmark International Quantum Statement," U.S. Embassy Japan, December 19, 2020, https://jp.usembassy.gov/us-japan-landmark-quantum-statement/#:~:text=The%20United%20States%20and%20the,%2C%20societal%2C%20and%20security%20benefits.

Tokyo, and technological breakthroughs that occur as a part of this partnership show promise for improving the quality of life in each country.

Space Cooperation

The U.S. and Japan have a well-documented and successful civil and commercial space relationship, which dates back as far as the 1970s,[14] and is a strong source of soft power for both countries. The enduring nature of the partnership between the National Aeronautics and Space Administration (NASA) and the Japan Aerospace Exploration Agency (JAXA), along with the space industry's relationship with the private sector in both countries, was on full display in 2020 when Japanese astronaut Soichi Noguchi joined three NASA astronauts aboard the SpaceX Crew-1 mission to the International Space Station (ISS). NASA and JAXA have announced plans for future collaboration, including JAXA participation on the Crew-2 mission to the ISS[15] and Japan's role in the lunar Gateway project on and around the moon as a part of the Artemis Project.[16] These developments are supported at the policy level by the U.S.-Japan Comprehensive Dialogue on Space. Since its establishment in 2013,[17] the group has met seven times, with its most recent meeting calling for deeper cooperation on space exploration, global navigation systems, the Artemis Project, and lunar exploration.[18] Spillover benefits from the space industry's growth are poised to inspire the next generation of astronauts and scientists in the U.S. and Japan and will help drive economic growth. Japan hopes to double the size of its domestic space industry from its current 1.2 trillion yen ($11 billion) by 2030,[19] fueling the next generation of space-based innovation.

[14] *Science, Technology, and American Diplomacy 1982.* Third Annual Report Submitted to the Congress by the President Pursuant to Section 503(b) of Title V of Public Law 95-426 (June 1982), 204-205.

[15] National Aeronautics and Space Administration, "NASA Announces Astronauts to Fly on SpaceX Crew-2 Mission to Space Station," press release, July 28, 2020, https://www.nasa.gov/press-release/nasa-announces-astronauts-to-fly-on-spacex-crew-2-mission-to-space-station.

[16] National Aeronautics and Space Administration, "NASA, Government of Japan Formalize Gateway Partnership for Artemis Program," press release, January 12, 2021, https://www.nasa.gov/press-release/nasa-government-of-japan-formalize-gateway-partnership-for-artemis-program.

[17] U.S. State Department, "Joint Statement from the First Meeting of the Japan-U.S. Comprehensive Dialogue on Space," press release, March 11, 2013, https://2009-2017.state.gov/r/pa/prs/ps/2013/03/205939.htm.

[18] U.S. Embassy Tokyo, "Joint Statement – The Seventh Meeting of the Japan-U.S. Comprehensive Dialogue on Space," press release, August 27, 2020. https://jp.usembassy.gov/joint-statement-7th-japan-us-comprehensive-dialogue-on-space/.

[19] Mari Yamaguchi, "Japan to Boost Space Cooperation with US in Revised Policy," *ABC News,* June 29, 2020, https://abcnews.go.com/Technology/wireStory/japan-boost-space-cooperation-us-revised-policy-71513109.

The most recent Comprehensive Dialogue recognized the importance of the military side of U.S.-Japan space relations. Japan's Air Self Defense Force (JASDF) has stood up the Space Operations Squadron and hopes to be fully operational by 2023 to protect Japanese satellite assets. As this force grows, cooperation with the U.S. Space Force and U.S. Space Command will be key for deepening U.S.-Japan space relations, building interoperability, and increasing regional security as China's space program continues to grow. The development of the U.S.-Japan space relationship will continue to be a key component of the U.S.-Japan S&T relationship.

Future Collaboration Opportunities

The U.S. and Japan will continue to play a leading role in technological development in the future, and the alliance must remain strong to address national security challenges, such as China's technological rise. In order to do this, the way the JHLC and JWLC address security-specific issues may require updating. In this space, the U.S. and Japan should work together to develop secure supply chains for advanced technology to mitigate risks posed by Chinese technology inputs and to protect those supply chains as trade tensions continue with China. To this point, Washington and Toyo should address setting standards for emerging technologies as an important mechanism to protect national security and economic competitiveness. Coordination in these areas could prevent China from achieving its goal of controlling technology industry standards by 2035,[20] dealing Chinese tech companies a major blow in the world market. To the degree possible without sharing proprietary information and stifling innovation ecosystems, the U.S. and Japan should also find ways to evaluate sectors at risk from intellectual property theft and protect critical industries like AI and QIS from these threats.

The U.S.-Japan science relationship promises to continue at the governmental and the R&D level. The next iteration of the JWLC should incorporate a science-specific track to focus on important contemporary issues, such as the COVID-19 response and readiness for a future pandemic as well as cooperation on particle physics, fusion plasma, materials science, and natural disaster resilience. The newly created quantum working group will help guide the U.S. and Japan as they work to develop the first implementable quantum internet and build S&T capabilities to counter China's authoritarian use of AI and other emerging technologies. Winning the quantum race will have major benefits for both national security and economic competitiveness for both nations.

NASA and JAXA collaboration should continue to serve as an inspirational source of soft

[20] 2020 Report to Congress of the U.S.-China Economic and Security Review Commission, 106.

power for the U.S. and Japan and position both countries as world leaders in space development and exploration. Deeper collaboration between NASA and JAXA and respective national security space agencies and the private sector should inspire young scientists and future astronauts in both countries, spur private sector space innovation, and fuel billions of dollars of investment in civil and commercial space sectors as both countries work towards fulfilling their roles in the Gateway Partnership and the Artemis Program. Aligning the civil and commercial space side with defense-level cooperation between the JASDF, U.S. Space Command, and U.S. Space Force will pay dividends when the Japan's Space Operations Squadron becomes operational in 2023, adding another boost to private sector space development.

Conclusion

The United States and Japan have a robust science, technology, and space relationship. Despite trade tensions in the 1980s, the U.S. and Japan found common ground for S&T cooperation and have developed deep and enduring S&T ties since then. Early cooperation groups led to today's more formalized structure of cooperation on specific issue tracks, including medical science, emerging technology, and space. The U.S. and Japan are poised to remain world leaders in the scientific and technological industries of the future and the growing national security and economic implications of these endeavors in science, technology, and space bodes well for the enduring nature of the U.S.-Japan alliance in these key fields. The future is bright for more U.S.-Japan collaboration across these sectors.

Author Biography

Erik M. Jacobs taught English in Japan as an Assistant Language Teacher on the Japan Exchange Teaching (JET) Program from 2013 to 2016 in the coastal city of Kobe-shi, Hyogo Prefecture. After returning from Japan, Erik received an MA in Asian Studies from Georgetown University and has been involved in the U.S.-Japan relationship in various government roles. He served as the project manager for the ministerial level 14th Joint High-Level Committee Meeting on Science and Technology Cooperation Between the U.S. and Japan at the White House and also worked on two Vice Presidential visits to Japan in 2018. Erik holds a BA in Political Science from Temple University with a concentration in Japanese and was a study abroad student at Temple University, Japan Campus in Tokyo during the March 11, 2011, Great Tohoku Earthquake.