

China Science and Technology Relations 2.0: Time for a Reset

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OVERVIEW

A recent Pew Research Center [survey](#) reports that more than three-quarters of all Americans have a negative view of China. Such anti-China sentiment has, unfortunately, contributed to policy shifts that are increasingly [damaging](#) to U.S. national interests, particularly in science, technology, and education. Where once cooperation with China brought shared benefits and substantial exchange of knowledge, today's climate of suspicion and mistrust is fostering disengagement at the very moment such partnerships are needed most. The last thing we want to do is curtail our access to the Chinese research and development, or R&D, system. It is essential for U.S. researchers and policy experts to remain engaged with China to avoid potential technological surprises. As world leaders in science and technology, or S&T, our two countries can benefit from knowledge sharing and collaboration.

While concerns about national security, intellectual property theft, and technology transfer [are real](#), U.S. policymakers have allowed [fear](#) to eclipse logic. The belief that any benefit to China is inherently detrimental to the U.S. undermines American universities and innovation potential. Reducing access to Chinese talent at a time when China is becoming a [global leader in STEM](#) fields risks isolating the U.S. academically and technologically.

Rather than blacklisting universities or discouraging exchange, the U.S. should encourage students to study in China to better understand its system, economy, and research landscape. During the 2023–24 academic year, 278,000 Chinese students were studying in the U.S. — a quarter of all international students. Yet, at the same time, the number of U.S. students studying in China had [dropped](#) to about 1,000.

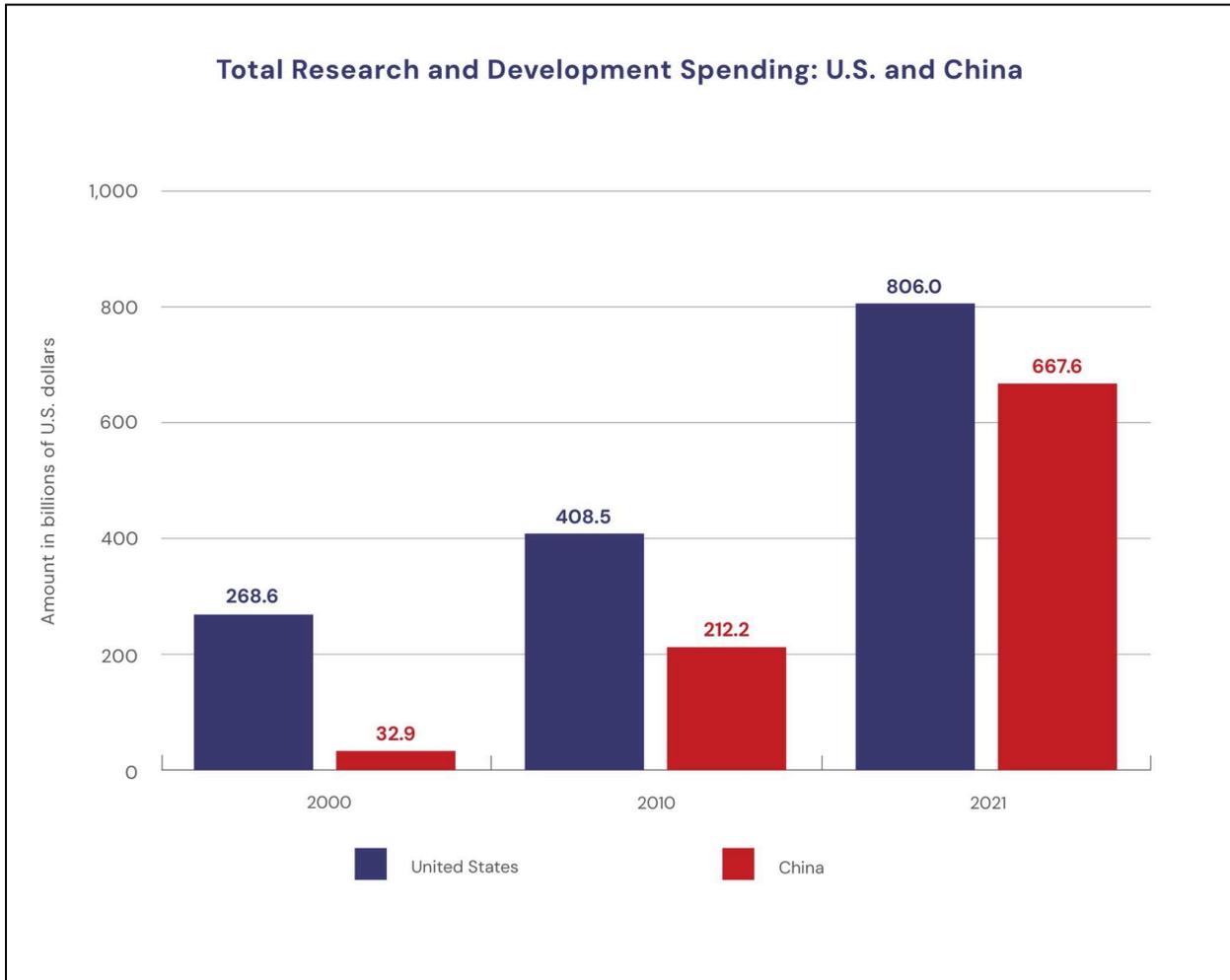
Shunning educational partnerships in the name of national security limits the very insight needed to navigate complex U.S.–China relations. The [Chips and Science Act](#), passed with bipartisan support under President Biden, contained many useful provisions intended to expand U.S. chip production through \$280 billion in funding. However, as stated in the [Federal Register](#), the act's provisions precluded using funds in ways that would directly or indirectly benefit “foreign countries of concern,” which includes China. Although President Trump initially described the act as a “horrible, horrible thing,” he has since created a new Commerce Department [“Investment Accelerator”](#) office to administer it.

DISCUSSION

The current situation calls for a major recalibration to guide future U.S.–China S&T cooperation. The original frameworks that governed U.S.–China S&T collaboration date to the 1979 agreement, and clearly were not sufficient to address the complexity of today’s relationship. The U.S. Innovation and Competition Act, passed by the Senate in 2021, illustrates this shift. Though it promoted domestic innovation, it was also riddled with anti–China provisions reflective of rising paranoia. A new and revised S&T agreement, which was finally signed in December 2024 during the last days of the Biden administration, contains an assortment of new provisions that better protect the interests of both countries.

Several significant transformations warrant a new approach:

China as an Innovation Leader: Once considered an innovation laggard, China is now a front-runner in innovation. China is second only to the U.S. in total R&D spending and is poised to surpass it. China leads in space exploration (Mars landings, lunar missions), deep-sea research, and quantum communication via its Mozi Jinan–1 satellites, the only satellites currently in space that are capable of exchanging quantum-encoded messages with base stations on Earth. In the global artificial intelligence, AI, race, the United States has long led, but China’s recent strides indicate it’s no longer just catching up. A prime example is DeepSeek, a Chinese AI startup that has achieved high-performance AI with significantly lower costs and resource consumption. DeepSeek’s success challenges the perception that China’s rise is simply state-driven mimicry. Founded in 2023, it relies on optimizing software and algorithms rather than the costly hardware race. Its DeepSeek–R1 model, trained on just 2,048 Nvidia H800 GPUs, cost \$6 million, a fraction of what U.S. firms spend. Moreover, DeepSeek’s commitment to open-sourcing its technology fosters innovation and collaboration.



Source: National Science Board, National Science Foundation, “Research and Development: U.S. Trends and International Comparisons. Science and Engineering Indicators 2024,” 2024, <https://ncses.nsf.gov/pubs/nsb20246/>. Note that totals for U.S. R&D spending includes federal capital funding for federal intramural and nonprofit R&D, in addition to what is reported as U.S. total R&D. Billions of dollars is in U.S. current purchasing power parity, PPP.

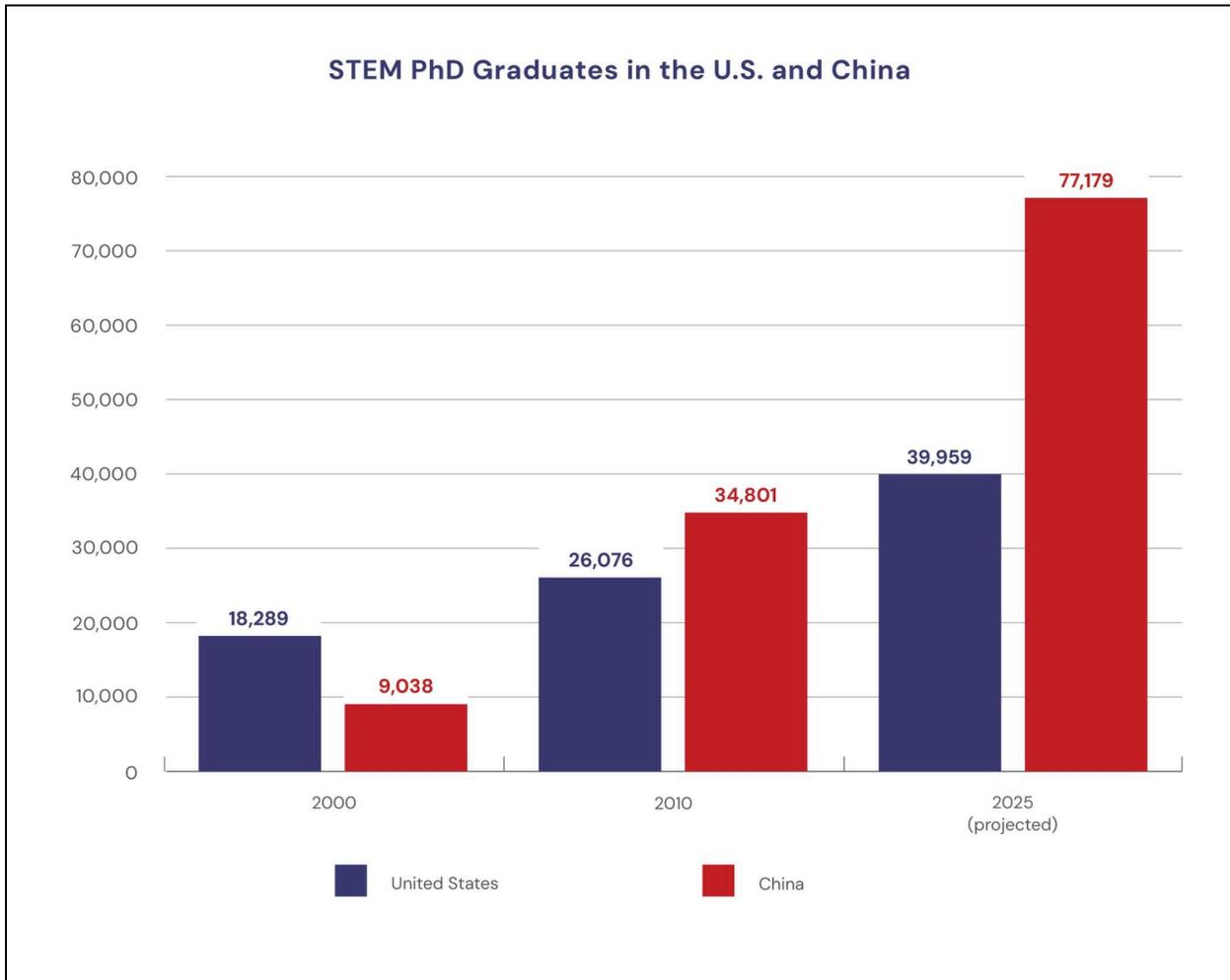
Technological Parity: The relationship between the U.S. and China in science and technology is evolving from a highly asymmetrical, hierarchical dynamic to one marked by greater parity in both capability and capacity. China is no longer just a recipient of intellectual capital but is now a major generator; its rise is evidenced not only by spending, but also by its patent generation and contributions to leading scientific publications. China’s R&D spending increased 11 percent annually between 2019 and 2023. The country now has a substantial pool of high-end science and engineering talent and a rapidly improving university system. In 2022, the number of R&D personnel reached 6.3 million — doubling in 10 years. China has also significantly modernized its R&D infrastructure. Its scientific publications and patent output now exceed that of the U.S., and its universities and institutions have also modernized significantly.

From Rule-Taker to Rule-Maker: China's approach to international S&T affairs has shifted dramatically, from merely catching up to actively competing, and from being reactive to playing a key role in shaping global S&T agendas and rule-making processes. China is no longer just a rule-taker or -breaker, but aspires to be a rule-maker. It has transformed from a peripheral player to one of the most influential countries in international S&T. China has formed S&T partnerships with over 150 countries and regions, executing more than 100 intergovernmental agreements on cooperation. Additionally, China is involved in more than 200 international S&T cooperation and research organizations. The country has appointed over 140 S&T diplomats in 70 overseas offices across 47 nations, showcasing its growing global presence. As of 2018, more than 400 Chinese scientists held positions in international S&T-related NGOs. Furthermore, China is now a key participant in global scientific initiatives, having initiated four of the world's 48 major cross-border science projects and officially participating in 17 others. This expansion of influence underscores China's increasing leadership and active role in global S&T governance.

Technology Exporter and Standards Setter: China has transitioned from being a learner and information-taker to becoming a source of technology transfer and a key player in shaping global technical standards. Between 2011 and 2021, China significantly increased its leadership roles in international standards-setting bodies, raising some concerns among China's critics. At the International Organization for Standardization, ISO, China's leadership expanded to 71 secretariats from 45, while at the International Electrotechnical Commission, it doubled its leadership roles to 12, from six. China also surpasses the United States in technical committee participation at ISO, with China involved in 729 committees compared to the U.S.'s 562. Additionally, China has taken a prominent role in the International Telecommunication Union, chairing twice as many standards focus groups as the U.S. As part of its growing global influence, China's Belt and Road Initiative, BRI, which spans over 65 countries, now emphasizes science, technology, and education alongside infrastructure projects. A recent study by the Council on Foreign Relations revealed that the BRI's focus has shifted toward digitalization, telecommunications, smart cities, artificial intelligence, and clean energy. The Chinese Academy of Sciences is pivotal in training future scientists and engineers to lead technological development across BRI nations, further solidifying China's position as a major global technology leader.

Brain Gain: China has undergone a significant shift, moving from a country struggling with "brain drain" to one that is now attracting qualified talent back home. This change is driven by China's rapidly advancing digital economy, where digitalization and the "Internet of Things" are taking hold faster than many realize. While not all of the brightest minds are returning, high-profile individuals like Shi Yigong, president of Westlake University in Hangzhou, have chosen to return to China, reflecting a broader trend. China is also aggressively recruiting scientific and engineering talent from abroad. Additionally, the presence of 10 Sino-foreign joint-venture universities and dozens of related projects has become a magnet for top international faculty. These universities, which must issue the same degrees as their overseas

counterparts, ensure that the degrees they offer are formally accredited in the United States, adding credibility and prestige to their programs.



Source: Remco Zwetsloot et al., “China is Fast Outpacing U.S. STEM PhD Growth,” Center for Security and Emerging Technology, Aug. 2021, 5, <https://cset.georgetown.edu/China-is-Fast-Outpacing.pdf>.

CONCLUSION

This growing influx of both returning and foreign talent underscores China’s transformation into a hub for innovation and scientific advancement, where top-tier professionals are eager to contribute to the country’s burgeoning technological landscape. These five transitions suggest that the context for bilateral collaboration has changed dramatically. We must move beyond outdated frameworks and negotiate new rules that address current challenges like cybersecurity, intellectual property protection, and academic integrity. Rather than decoupling, we should pursue structured engagement.

The notion of “decoupling” is particularly shortsighted. There is no global challenge — from climate change to global health — that can be solved without close U.S.–China collaboration. Cutting the U.S. off from China will also damage the U.S. ability to learn from developments at the global frontier of advanced manufacturing technology. An appropriate degree of technological and scientific cooperation between the two powers is a [necessity](#), not a luxury.

China, for its part, is doubling down on innovation in response to growing geopolitical tensions. As it concludes its [14th Five-Year Plan](#) and Made in China 2025, its next phase will focus heavily on AI, quantum computing, biotech, and semiconductors. It is already a leader in electric vehicles, solar energy, and high-speed rail. The 15th Five-Year Plan is [expected](#) to emphasize technological self-reliance even more aggressively.

Clearly, some problems require our urgent attention, especially those involving intellectual property protection, cybersecurity, academic access, and research ethics. It is in our joint interest to arrest these problems before the current downward spiral in relations acquires even further momentum. U.S. policymakers must understand that this is not a reactionary China but a proactive one, determined to lead in the industries of the future. [Disengagement](#) from China does not weaken its resolve; it only isolates the U.S. from shaping global norms and standards.

As noted, the U.S.–China Science and Technology Agreement, STA, was, after much debate, renewed for five years in December 2024. The revised STA includes appropriate guardrails to address personal and data security issues of concern to both sides, specifically excluding critical or emerging technologies. It seems clear that the Trump administration has no intention of pursuing the STA and, as of this writing, has plans to [close](#) the State Department office responsible for bilateral science cooperation agreements.

We must rethink our approach to S&T and education cooperation with China as well as other countries. This is not about ignoring valid security concerns, but about avoiding a one-dimensional response driven by fear.

A new framework for U.S.–China science and technology cooperation should focus on areas where mutual interests align with global challenges, complementary strengths, and low geopolitical sensitivities. Accordingly, the most probable targets for a revival of cooperation are those addressing universal challenges and operating within the newly introduced guardrails dealing with data and personal security. New collaborative initiatives should also accommodate a reasonable modicum of competition. Success will depend on balancing the mutual benefits with safeguards against technology misuse and appropriation.

Such a framework, grounded in realism and mutual benefit, can restore trust and harness the tremendous potential for collaboration in areas that affect the future of the entire planet. The time to act is now — not with fear, but with vision.

About the Authors

Denis Simon, PhD, is an expert on international business and technology affairs. He has more than four decades of experience studying business, competition, innovation, and technology strategy in China. Most recently, he has served as the holder of the Bank of America Chair at the Schwarzman College on the campus of Tsinghua University in Beijing. He also has served as Professor of Practice at Duke University's Fuqua School of Business and executive vice chancellor of Duke Kunshan University in China (2015–20). He was a founding member of the Experts Group of the U.S.–China Innovation Dialogue organized by the White House Office of Science and Technology Policy and China's Ministry of Science and Technology (2008–17). In addition, he served as a special adviser on several cross-border innovation projects, including at the U.S. Patent and Trademark Office, regarding intellectual property rights issues in China. He also has been a senior adviser on China and global affairs at several U.S. universities. From 1995 to 2000, he was general manager of Andersen Consulting in Beijing (now Accenture) and was founding president of Monitor Group China (2001–02). He earned his PhD and MA from the University of California, Berkeley, and his BA from the State University of New York.

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