Written Statement for Senate AI Insight Forum: AI and National Security

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Thank you for the opportunity to participate in this forum. It is an honor to be here and contribute to this discussion. I am currently a Senior Fellow at the Center for Security and Emerging Technology (CSET) at Georgetown University where I research S&T policy development and global technology competition. I previously served as the National Counterintelligence Officer for East Asia and for most of my career I have studied China's science and technology (S&T) development and innovation ecosystem, including its efforts to acquire technology and technological know-how, how these efforts have changed over time and the policies and programs China uses to meet its strategic goals.

China's policies and programs to target U.S. technology will have far reaching implications for U.S.-China strategic competition. Here, I will provide a brief overview of China's S&T system, discuss research security and potential mitigation strategies and discuss how our systems differ. Lastly, I'll offer lessons learned, which include:

- China's system is not the same as ours. It takes a holistic approach to developing technology—blurring the lines between public, private, civilian and military. Its universities, researchers and companies are a product of this system and are not neutral actors that function like our own.

- China says it will use any knowledge or technology it acquires for its military. This is not conjecture, profiling, or analysis, but China's stated position for decades. Our policies and mitigation strategies need to reflect this reality.

- Regardless of their personal views, Chinese scientists, businesspeople and officials interacting with U.S. universities, research entities and companies have to respond to the PRC's government or security services if they are asked for information or data. China intimidates and harshly silences its critics—this has only grown more so in the past few years. This increasingly includes its citizens abroad.

- Beijing in many ways understands our societal tensions, which include race relations, and its statecraft is directed at them, exploiting identity politics by promoting any changes in U.S. policy as ethnic profiling, offering a narrative about being merely a proponent of "development" and science, in order to divert attention from its own questionable behavior. This is a well-funded effort.[1]

It is because of this last point that I want to acknowledge how difficult and challenging discussing these issues can be. My own grandparents were immigrants who came to this country with little formal education, worked menial jobs and made a new life for themselves. My

presence here today is a testament to the American Dream. There is no room for xenophobia or ethnic profiling in the United States—it goes against everything we stand for as a nation.

And precisely because of these values, the issues we are discussing today will make us uncomfortable as we move forward to find principled ways to mitigate the policies of a nation-state that is ever more authoritarian, does not share our values and seeks to undermine the global norms of science and commerce and exploit our national innovation base. These challenges are not about the concerns of one administration or the policies of one political party, but the actions of a nation-state with a different system, different regard for human rights and different view of competition, and one that has put in place policies and programs that undermine the very values we hold dear: a fair and level playing field, transparency, reciprocity and market-driven competition.[2]

The Importance of S&T and the Threat from China

Emerging technologies—such as AI, biotechnology and green tech—are increasingly at the center of global competition, providing the foundational research and developments that underpin future industries and drive economic growth. These emerging technologies will alter economic, political and security dynamics and directly affect national security and competitiveness. However, knowledge-based industries rely on collaborations and sharing of data, research and human capital across national borders. While this has always been a U.S. strength, it creates vulnerabilities in our innovation base as some countries use these collaborations and exchanges to support the expropriation of existing know-how and talent. This often includes the acquisition of technology and technological know-how through legal, illegal and extralegal means.

While China is not the only country that targets U.S. technology, according to the ODNI's 2023 Annual Threat Assessment[*] "China is the top threat to U.S. technological competitiveness, as it targets key sectors and proprietary commercial and military technology from the U.S. and allied companies and institutions." Beijing views technology—and the robust S&T infrastructure needed to develop it—as a national asset. The way it has structured its system to reach this goal is inherently at odds with key assumptions of the global norms of science which are built on transparency, reciprocity and sharing. Beijing, especially Xi, looks at development as a zero sum game and that government support for key industries—the emerging technologies such as AI, next generation communications and biotechnology—gives China an advantage. Xi's statements include the following:

- "We must regard science and technology as our primary productive force, talent as our primary resource, and innovation as our primary driver of growth," (November 2022)
- "We should seize the commanding heights of technological innovation." (May 2018)
- "Artificial Intelligence is a vital driving force for a new round of technological revolution and industrial transformation. China must control artificial intelligence and ensure it is securely kept in our own hands" (October 2018)[3].

[*] https://www.dni.gov/files/ODNI/documents/assessments/ATA-2023-Unclassified-Report.pdf

Drivers of Technology Acquisition: Central Government S&T PLANS

China recognizes that future strength will be built on 5G, AI, biotechnology and advanced manufacturing. Its S&T development plans focus its efforts on acquiring technology that will help build these future industries, as well as the supporting industries that enable them. These are not always the "cutting edge" technology, but they either fill a strategic gap or help China control key supply chains for materials or goods.[4] China's priorities are laid out in major policies like the Medium- and Long-Term Development Plan (MLP), Strategic Emerging Industries Strategy, and Made in China 2025.[5]In pursuing these technologies, China's lack of transparency with collaborators and aggressive technology acquisition practices pose increasing national security concerns. The policies focus not only on specific technology areas but seek to create the environment to foster innovation and development, and most importantly build a national innovation base that will be the foundation for future economic growth and military modernization that Beijing controls.

China's plans for Strategic Emerging Industries[6] also lays a blueprint for its future goals of dominating key sectors[*]. It articulates how its goals are securing the China market first on the way to building global champions—such as Huawei, BGI and CATL—creating a model for how China breaks into and controls key sectors. These national champions are the embodiment of China's industrial policies.

The "13th Five-year Plan for Military and Civil Fusion"[7] was established in 2017 and focused on emerging technologies. The plan specifically calls for a "cross-pollination of military and civilian technology in areas not traditionally seen as 'national security issues,' such as quantum telecommunication and computing, neuroscience and brain-inspired research," and states that such projects will be supported by foreign outreach initiatives. In addition to these overarching projects, there are programs to develop specific high-tech areas such as biotechnology, integrated circuits, and "next-generation" artificial intelligence.[8] Each such program highlights the role foreign "talent" is expected to play.

Human Cost of China's Behavior: The Role of Non-Traditional Collectors

One of the biggest challenges to understanding the scale and scope of China's actions, and designing mitigation strategies, is China's use of what are called "non-traditional collectors." These are the experts—scientists, students and business people—who work on particular research projects in different industries and target technology and technological information. This is a different methodology and is documented in Chinese language policy documents over the last several decades.[9] Our system—and I would add our institutions and the authorities we have granted them—is not designed to counter this kind of threat. Traditionally, counterintelligence has focused on intelligence officers, military end-use and illegal activities. I tell you today, if we only focus on trying to mitigate China's illegal actions, those undertaken by intelligence officers or those only related to military technology, we will fail.

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[*] The following are considered strategic emerging industries: energy efficient and environmental technologies; next generation information technology; biotechnology; high-end equipment manufacturing; new energy (such as solar or wind); new materials; and new energy vehicles—including batteries.

Talent Programs[10]

The CCP and Chinese government continue to view Western education as an entry point into the U.S. innovation base because it is an easier target. Xi has called human capital the "first resource"[11] and China's policies reflect this.

- Chinese government's National Medium and Long-term Talent Development Plan (2010–2020), stated that talent was core to the country's social and economic development and set detailed national talent targets.[12]
- 2017: "Plan to Build a National Technology Transfer System." A comprehensive articulation of China's tech transfer system. The acquisition of "high-level overseas talent"—both ethnic Chinese scientists from abroad and other foreign scientists—is emphasized throughout.
- 2016: "Planning Guide for Manufacturing Talent Development." Joint plan to import (another) "1000" foreign experts able to make "breakthrough" improvements, via talent programs and other venues. Emphasizes recruiting from "famous overseas companies."
- CAST's "HOME Program" (or Haizhi Plan, 海智计划)," instituted in 2004 by the Chinese Association for Science and Technology to "Help Our Motherland through Elite Intellectual Resources from Overseas," and supported by China's central and local governments. Its 2019 slate includes 29 projects.[13,14]

Conclusions

China's holistic approach to development, blurring what is civilian, what is military, what is private and what is public—has deep implications for U.S. China competition. It impacts the basis for entry of Chinese students and post-docs into U.S. labs because of China's ability to compel citizens to share information. It also challenges existing export and visa policies that build their restrictions around affiliations with a military end-user but make exceptions for civilian uses. To the Chinese leadership, every civilian use is also a potential military use.[15]

There is no magic bullet to solving these complex challenges but, mitigation strategies should include investments in our own future, as well as concrete steps in the short-term that focus on protecting our innovation base. These steps should include stemming China's influence in our academic and research institutions through enhanced reporting requirements for resources from the Chinese government and talent programs or dual appointments, and tying collaborations and access to U.S. facilities and data to meeting the agreed upon criteria of any S&T agreement. Below are additional suggestions for what a mitigation strategy should include:

Improve ourselves: The United States and other liberal democracies must invest in their respective futures. Not all discovery has immediate commercial applications—it took 30 years from discovery to development of the Lithium-ion battery. We must accept that everything should not be only about the lowest cost, but instead focus on the highest value for the nation. We must build research security into future funding programs.

Face the facts: Beijing doesn't play by free-market rules, it does not respect intellectual property, it is willing to act directly or indirectly to ensure its favored companies win in the market, and it doesn't share the same views on political openness the United States, Europe and other "like-minded" countries have long shared. Engagement with China has not made it more open, and it

has not acquiesced to existing norms and rules. Acknowledging this reality complicates mitigations, because we are not negotiating on individual policies but against a different system.

Ensure True Reciprocity: Too often S&T agreements between U.S. and China's entities do not result in true reciprocity including sharing of data from China, access to China's most advanced institutions, and interactions with China's scientists without government interference. Connecting China's reciprocity and sharing of scientific data to its access to U.S. institutions and big science facilities is a leverage point.

In moving forward, I leave this forum with the following thoughts:

- Extreme propositions, such as closing our eyes (laissez faire) or closing our doors, only benefit China—the latter by discrediting en masse all efforts to address the problem and by depriving ourselves of the contributions of foreign-born scientists.

- China's policies and plans form a complementary web of development and industrial policies for emerging technologies—and talent growth—and most importantly build a national innovation base that will be the foundation for future economic growth and military modernization that Beijing controls. ***It is not where they are today in certain fields, but the rate of change that we should focus on.***

- China's policies are increasingly challenging for the United States and its allies to counter with policy measures because ***most policy measures are tactical and not designed to counter an entire system that is structurally different***.

What will also make this difficult is that the reality that China is presenting is inconvenient to those benefiting in the short-term. This includes companies looking for short-term profits, not long-term sustainability of a particular industry, academics that benefit personally from funding or cheap labor in their labs, and former government officials who cash in as lobbyists for China's state-owned and state-supported companies.

By not talking about the structural differences in our systems and instead focusing on individual instances of bad behavior—what is happening can seem anecdotal. In order to protect U.S. competitiveness, we have to move beyond the current tactical approach—and instead build research security into our investments, policies and programs from the beginning.

I want to thank this body for continuing to discuss this issue. These are hard conversations that we as a nation must have if we are to protect and promote U.S. competitiveness, future developments, and our values. If we do not highlight and address China's policies that violate global norms and our values, we give credence to a system that undermines fairness, openness and human rights, and deprives China's educated elite of the dignity they aspire to and deserve. The Chinese people deserve better. The U.S. people deserve better. Our future depends on it.

[1] William C. Hannas and Didi Kirsten Tatlow, *Beyond Espionage: China's Quest for Foreign Technology* (Routledge 1st edition, September 2020); Alex Joske, "Hunting the Phoenix," Australian Strategic Policy Institute, 2020, https://www.aspi.org.au/report/hunting-phoenix ; Receipts of local UFWD paying overseas scientists available at: "The distribution list of provincial-level projects for the introduction of foreign intelligence special funds at the provincial level in 2018" [2018 年省级引进国外智利专项经费直项目分配明细表], https://web.archive.org/web/20201112190122/http://webcache.googleusercontent.com/search?q=cache%3AKAaZ3LpEe4oJ%3Arst.hunan.gov.cn%2Frst%2Fxxgk%2Ftzgg%2F201802%2F9516964%2Ffiles%2Fe1c7ddd51dda49f6b70a6ad5ae9b0490.xls+&cd=3&hl=en&ct=clnk&gl=us

[2] E.g., "The IP Commission Report." The Commission on the Theft of American Intellectual Property (May 2013). Hannas, Mulvenon and Puglisi, *Chinese Industrial Espionage*. (Routledge, 2013) hereafter "*CIE*." Michael Brown and Pavneet Singh, "China's Technology Transfer Strategy" (DIUX, February 2017). Section 301 *Report into China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation*. Office of the United States Trade Representative (27 March 2018). U.S.-China Economic and Security Review Commission, "2019 Annual Report to Congress" (November 2019).

[3] 国务院关于印发"十三五"国家战略性新兴产业发展规划的通知. State Council, 2016

[4] 十三五" 科技军民融合发展专项规划. MOST, CMC, 2017; 国务院关于印发"十三五"国家战略性新兴产业发展规划的通知. State Council, 2016; 国家科技创新基地优化整合方案. MOST, MOF, National Development and Reform Commission, 2017; 十三五" 科技军民融合发展专项规划. MOST, CMC, 2017; Simon and CAO, "China's Emerging Technological Edge: Assessing the Role of High-End Talent". Cambridge University Press, 2009.

[5] Simon and CAO, "China's Emerging Technological Edge: Assessing the Role of High-End Talent". Cambridge University Press, 2009; **Cong CAO, Richard Suttmeier, and Denis Fred Simon. "China's 15-year Science and Technology Plan," Physics Today, December (2006), pp. 38-43;** Hannas et al., "Chinese Industrial Espionage: Technology Acquisition and Military Modernization" Routledge, 2013.

[6] XU, Yingying, "The Strategic Emerging Industries: A new stage for Manufacturing in China" The Economist, 13 March 12; www.most.gov.cn/eng/programmes1/200610/t20061009_36225.htm]www.863.gov.cn/; Osnos, Even, Green Giant: Beijing's Crash program for clean Energy, The New Yorker, 21 December 2009; www.gov.cn/english/2006-02/09/content_184156.htm; Du Minghua, "863" Hi-Tech Program Blueprinting China's Future, 1 January, 200, from China Education and Research network website www.edu.cn/achievement_1509/20060323/t20060323_4403.shtml; Chinese government policy documents at : www.china.org.cn/english/scitech/34496.htm, www.most.cn/eng/ and Cao et al., *China's 15-year science and technology plan*, Physics Today, December 2006; "New Policies to be Issued to Lure Overseas Students Home," *People's Daily*, 29 July 2000, "China Allotted 200 Million Yuan for Students Returned from Overseas," *People's Daily*, 22 January 2002; McGregor, James, China' s Drive for "indigenous Innovation" A Web of Industrial Policies, Global Regulatory Cooperation Project, US Chamber of Commerce.

[7] Translation of "The 13th Five-Year Special Plan for S&T Military-Civil Fusion Development" ["十三五"科技军民融合发展专项规划], Center for Security and Emerging Technology; "Opinions on the In-Depth Development of Military-Civil Fusion" [军民融合深度发展的意见], General Office of the State Council on Promoting the National Defense Technology Industry [国务院办公厅关于推动国防科技工业], December 2017, https://perma.cc/4M58-X4C2; "'Military-to-civilian' and 'civilian-to-military' pace accelerates, the development of MCF continues to release new momentum" ["军转民""民参军"步伐加快军民融合发展持续释放新动能], China Financial News Network [中国金融新闻网], August 1, 2018, https://perma.cc/B4FH-H2SK

[8] "十三五" 科技军民融合发展专项规划. MOST, CMC, 2017; "十三五" 生物技术创新专项规划 (*13th Five-year Plan for Biotechnology Innovation*). MOST, 2017; 国家集成电路产业发展推进纲要 (National Integrated Circuit Industry Development Plan). State Council, 2014; 新一代人工智能发展规划. (Next-Generation Artificial Intelligence Development Plan). State Council, 2017.

[9] These policies include "two bases formula", "short-term visits" and "serve in place. See Hannas et al., Routledge 2013 more a more in depth treatment of these policies.

[10] Original CSET Data Visualization, "Chinese Talent Program Tracker," Center for Security and Emerging Technology, November 2020. https://doi.org/10.51593/20200066

[11]]"十三五" 生物技术创新专项规划 (*13th Five-year Plan for Biotechnology Innovation*). MOST, 2017; 国家集成电路产业发展推进纲要 (National Integrated Circuit Industry Development Plan). State Council, 2014; 新一代人工智能发展规划. (Next-Generation Artificial Intelligence Development Plan). State Council, 2017; "Why is Xi Jinping's 'First Resource' so important?" ["习近平眼里的"第一资源"为何如此重要"], *People* [人民网], July 18, 2018, http://politics.people.com.cn/n1/2018/0718/c1001-30155931.html.; 国家技术转移体系建设方案. State Council, 2017; 制造业人才发展规划指南. MOE, MHRSS, MIIT, 2016.

[12] "十三五" 科技军民融合发展专项规划. MOST, CMC, 2017.

[13] Hannas and Tatlow, "China's Quest for Foreign Technology: Beyond Espionage" Routledge, 2020.

[14] "十三五" 科技军民融合发展专项规划. MOST, CMC, 2017; "十三五" 生物技术创新专项规划 (*13th Five-year Plan for Biotechnology Innovation*). MOST, 2017; 国家集成电路产业发展推进纲要 (National Integrated Circuit Industry Development Plan). State Council, 2014; 新一代人工智能发展规划. (Next-Generation Artificial Intelligence Development Plan). State Council, 2017.

[15] Hannas, Mulvenon and Puglisi, *Chinese Industrial Espionage*. (Routledge, 2013) hereafter "*CIE*." E.g., "The IP Commission Report." The Commission on the Theft of American Intellectual Property (May 2013). Michael Brown and Pavneet Singh, "China's Technology Transfer Strategy" (DIUX, February 2017). Section 301 *Report into China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation*. Office of the United States Trade Representative (27 March 2018). U.S.-China Economic and Security Review Commission, "2019 Annual Report to Congress" (November 2019).