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Seven Sons and Mullahs: Chinese–Iranian Defense-Linked Academic Collaboration

Assaf Orion and Jacob Sanchez | November 10, 2025

China's relations with Iran were recently tested during the twelve-day Israel–Iran war and the US strike on Iran's nuclear sites. While China's diplomatic statements supported Iran verbally, they did little else. Chinese media reports covered the Iranian minister of defense's visit to Beijing in June and mentioned the possible supply of air defense systems and fighter jets to Tehran, although China denied the former. As Beijing is typically cautious in its security, defense, and military cooperation with Iran, most public attention in the West and the Middle East tends to focus on Chinese–Iranian relations in energy, trade, economy, infrastructure, and diplomacy. Publications addressing their security relations usually emphasize surveillance systems supplied to Iran, joint military and naval exercises, and the ongoing transfer of technological components and materials to Iran's defense industry. In the aftermath of the war, one may also expect to see sharing of techno-operational learning between China and Iran, possibly involving their other network partners, Russia and North Korea.

This study examines a lesser-known aspect of security-technological cooperation between Beijing and Tehran: joint and expanding academic-technological research linked to the defense establishments of both countries, in fields such as nuclear energy, aerospace, missiles, UAVs, underwater vehicles, and cyber. Drawing on recent academic articles co-authored by Chinese and Iranian experts, it reveals joint research efforts and some convergence between the two countries' defense innovation ecosystems. This cooperation between China and Iran—respectively the main national security threats to the United States and Israel—poses a potential risk not only to these two allied states but also to their partners in Europe, the Asia-Pacific, and the Middle East. This risk should be recognized, monitored, analyzed, and addressed, both separately and collectively.

Background—A Scientific Military-Civil Partnership

On March 27, 2021, the People's Republic of China and the Islamic Republic of Iran signed a Comprehensive Strategic Partnership agreement.[1] China's pledge of a $400 billion investment in Iran, which has yet to be fulfilled, attracted significant global attention. Less attention was given to the sections of the agreement focused on technology development, including military.[2] More recently, many experts have examined China's role as part of the Euro-Asian "axis of evil," alongside Russia, Iran, and North Korea ("CRINK"), whose partners exchange

[1] https://iranchinaejob.ir/wp-content/uploads/2023/02/iran-china-25-year.pdf (Archive)
[2] Assaf Orion, "Strategic Partnership Ltd.: China–Iran Relations and Their Significance for Israel," INSS Special Publication, 2021, https://www.inss.org.il/publication/iran-china-cooporation/

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resources, components, war materiel, and forces, as well as military experts, lessons, knowledge, and technology.[3]

China and Iran are not formal allies but rather important partners, united against a common rival and sharing quite a few interests. While reports about China's role as Iran's major oil customer, trade partner, political supporter, and limited military partner are numerous, far less is understood about their partnership in science and technology, especially in military and defense applications.

Both China and Iran are seeking synergies in civil and defense efforts, especially in science, technology, and industry: China through its military-civil fusion (MCF, 军民融合) strategy, and Iran with its "Strategic Document on Science, Technology, and Innovation in the Field of Defense and Security" (SDSTIFDS).[4] These respective policy frameworks lay a foundation for collaboration between private-sector researchers, academics, and national defense-affiliated organizations in both countries, fostering a partnership for joint defense-focused scientific and technological initiatives.

In August 2025, Iranian and Chinese officials publicly reaffirmed their commitment to deepening scientific and technological cooperation, signing new memoranda of understanding on the sidelines of the second Belt and Road Conference on Science and Technology Exchange in Chengdu.[5] Statements from both sides highlighted plans to expand researcher exchanges and youth skill programs, announced the forthcoming inauguration of an Iran House of Innovation and Technology (iHiT) in mainland China, and proposed the establishment of two new cooperation mechanisms—the BRI TechMatch platform and BRI LabsNet network.[6] Together, these initiatives represent concrete steps toward operationalizing the Iran–China strategic partnership within the Belt and Road framework.

Strong institutional ties link certain academic institutions in China and Iran to their respective national defense establishments. In China, the hallmark of such institutes is perhaps the "Seven Sons of National Defense" (国防七子), seven Chinese public universities that effectively form the core of China's defense-related scientific research complex.[7] In Iran, institutes within the university system play a central role in supporting the country's strategic weapons development programs, particularly those linked to the Islamic Revolutionary Guard

[3] Assaf Orion, "Two 'Axes' Converging in Iran," Washington Institute for Near East Policy, December 23, 2024, https://www.washingtoninstitute.org/policy-analysis/two-axes-converging-iran; see also the multiple publications of CNAS under "Axis of Upheaval," https://www.cnas.org/axis-of-upheaval; and of CSIS, under "A New CRINK Axis of China, Russia, Iran and North Korea?," https://www.csis.org/special-initiatives/CRINK-Axis

[4] MCF is a state-led strategy to integrate civilian technological innovation into military modernization efforts. SDSTIFDS is Iran's policy to align civilian research and emerging technologies with national defense objectives—For both terms, see Appendix II.

[5] Tehran, Peking beef up sci-tech ties." *Tehran Times,* August 24, 2025, https://www.tehrantimes.com/news/517114/Tehran-Peking-beef-up-sci-tech-ties

[6] Ibid.

[7] "Seven Sons of National Defense," China Defense Universities Tracker, https://unitracker.aspi.org.au/topics/seven-sons-of-national-defence/

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Corps (IRGC) and the Ministry of Defense and Armed Forces Logistics (MODAFL).[8] Cooperation between these sets of institutions in China and Iran is likely aimed at advancing defense-related scientific knowledge and technology in both countries.

Notably, while Western academia revolves around academic freedoms, often managing tensions with governments, China and Iran's academic systems are more closely tied to their governments, with academic collaboration being part of national endeavors, including for defense and security purposes.

Methodology

Our data focuses on 753 articles out of 20,875 academic articles that were jointly published in English by researchers from China and Iran between 2006 and 2025. These select publications were co-authored by researchers at China's "Seven Sons" universities on one side and Iranian universities, many of which have defense and security links, on the other. The dataset was compiled using the Parallax Labs "Data Abyss" platform, based on publicly available data.[9] Data Abyss's proprietary language model, Elliot, was then used to identify preliminary potential defense applications of the co-authored publications. By definition, our limited research scope implies that the findings represent only the tip of the iceberg and are a small sample of a larger phenomenon that deserves more extensive research.

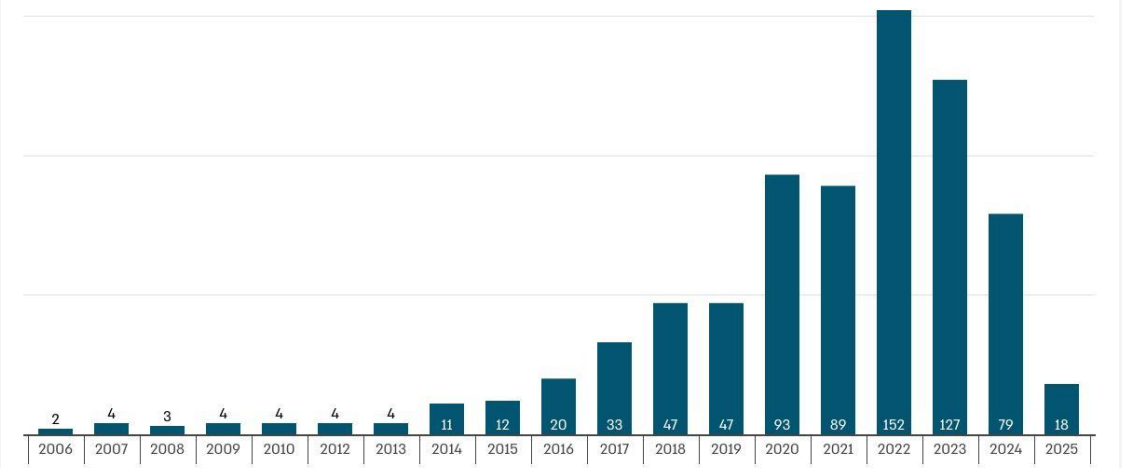
Quantitative Findings

The time pattern of co-authored academic publications between China's "Seven Sons of National Defense" and Iranian defense-linked universities, particularly those connected to the IRGC or other defense entities, reveals a clear, although uneven, acceleration in technological engagement over the last decade, followed by a decline in the past three years (see Figure 1).

[8] CIA, World Factbook, "Military and Security," https://www.cia.gov/the-world-factbook/about/archives/2023/countries/iran/#military-and-security; Iran Watch, "Ministry of Defense and Armed Forces Logistics (MODAFL)," https://www.iranwatch.org/iranian-entities/ministry-defense-armed-forces-logistics-modafl

[9] "Data Abyss" website, https://www.dataabyss.ai/

Figure 1. The Great Surge: Co-Authored Papers by China's Seven Sons and Iranian Universities (per year)



When counted by year, the general trend shows a modest beginning until 2013, followed by a notable increase between 2014 and 2019, and then a steep rise peaking in 2022. This surge may reflect the fruition of previous collaborative efforts and perhaps also a boost from the implementation of the Comprehensive Strategic Partnership agreement in 2021. The reasons for the decline since 2023 warrant further research.

Institutional Distribution of Co-Authored Publications

The institutional breakdown of the co-authored publications between China's "Seven Sons of National Defense" and a limited selection of Iranian defense-linked universities reveals key academic actors driving scientific collaboration.[10]

On the Chinese side, the Harbin Institute of Technology (HIT) is the leading institution and accounts for 39% of the publications co-authored with Iranian partners (see Figure 2). It is followed by the Nanjing University of Aeronautics and Astronautics (NUAA) at 19% and the Northwestern Polytechnical University (NWPU) at 15%. Other notable contributors include Beihang University of Aeronautics and Astronautics (BUAA) at 10%, Beijing Institute of Technology (BIT) at 9%, Nanjing University of Science and Technology (NJUST) at 6%, and Harbin Engineering University (HEU) at 2%.

[10] Figures 2 and 3 only include the Iranian Universities for which we have isolated examples provided within this report.

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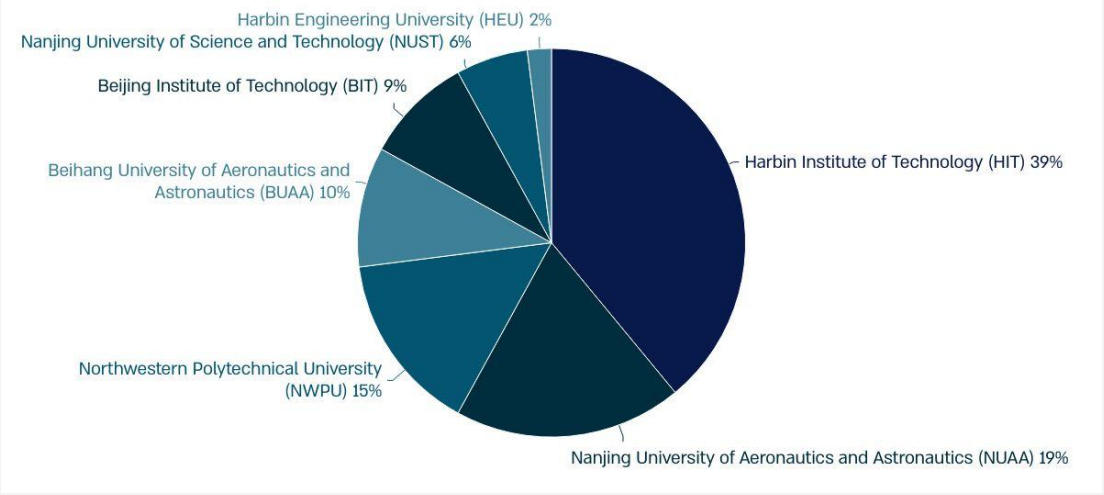
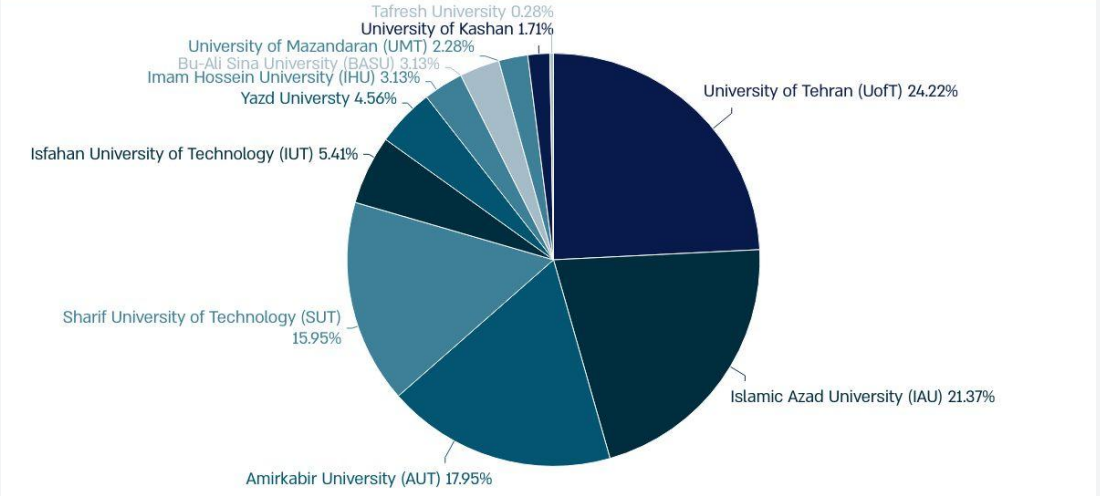
Figure 2. Distribution of Iranian Co-Authored Papers Among China's Seven Sons



On the Iranian side, the University of Tehran leads with 24% of co-authored publications, followed closely by Islamic Azad University (IAU) at 21% and Amirkabir University (AUT) at 18% (see Figure 3). Sharif University of Technology (SUT), at 16%, also plays a major role. Other contributors include Isfahan University of Technology (IUT) at 6%, Yazd University at 5%, with smaller shares from institutions such as the IRGC-linked Imam Hossein University (IHU), Bu-Ali Sina University (BASU), and Tafresh University, which holds the smallest share at just 0.28%.

Figure 3. Distribution of Papers Co-Authored with Seven Sons among Iranian Universities



In terms of a collaboration network, HIT emerges as the central Chinese partner, maintaining the highest number and strongest collaborative links with Iranian universities, particularly AUT, SUT, and UT. Other key Chinese institutions include BIT and NUAA, both of which sustain active ties with multiple Iranian counterparts. Among the Iranian institutions, SUT, AUT, and UT form the core of the network, displaying dense connections with several of China's "Seven

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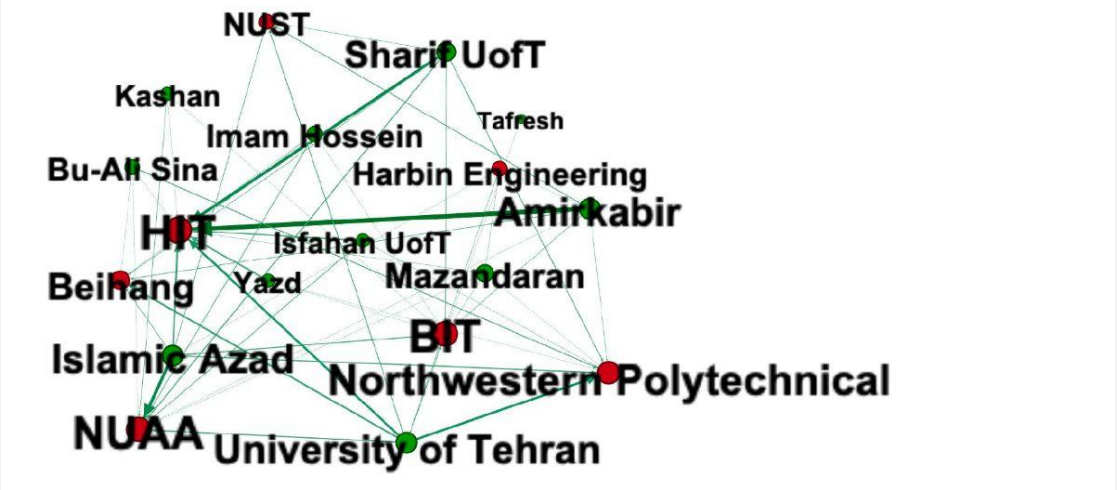
Sons" institutions. Additional contributors include IAU, UMZ, and IUT, along with smaller but noteworthy ties with IHU, Yazd, BASU, Kashan, and Tafresh.

The structure of this network reflects a focused and strategic partnership landscape, concentrated largely on high-tech and engineering collaboration (see Figure 4). Notably, one of the smaller but strategically significant institutions, Imam Hossein University, was targeted by Israel in an airstrike on June 18, 2025, as part of a broader campaign targeting Iran's military infrastructure.[11] IHU, a key research center affiliated with the IRGC, was reportedly involved in nuclear and missile technology development.[12]

Figure 4. A Sample of the Collaboration Between China's Seven Sons Universities and Iranian Universities



Qualitative Findings

Within the dataset of 753 scientific publications co-authored by Iranian scientists and counterparts from China's Seven Sons, at least 15 individual articles appear to have potential implications for defense applications or direct military integration. These cases are discussed in the qualitative findings section below.

Potential Defense Technology Applications

The 15 articles were classified into four technological domains based on their respective potential defense applications: Nine studies focused on aerospace, missile propulsion, and UAVs, while the remaining six were evenly split, two each, across nuclear engineering research; naval technologies: submarines and autonomous underwater vehicles (AUVs); and cyber-related technologies (see Figure 5). These studies are described below.

[11] Avery Borens et al., "Iran Update Special Report, June 18, 2025, Morning Edition," Institute for the Study of War, https://www.understandingwar.org/backgrounder/iran-update-special-report-june-18-2025-morning-edition
[12] Ibid.

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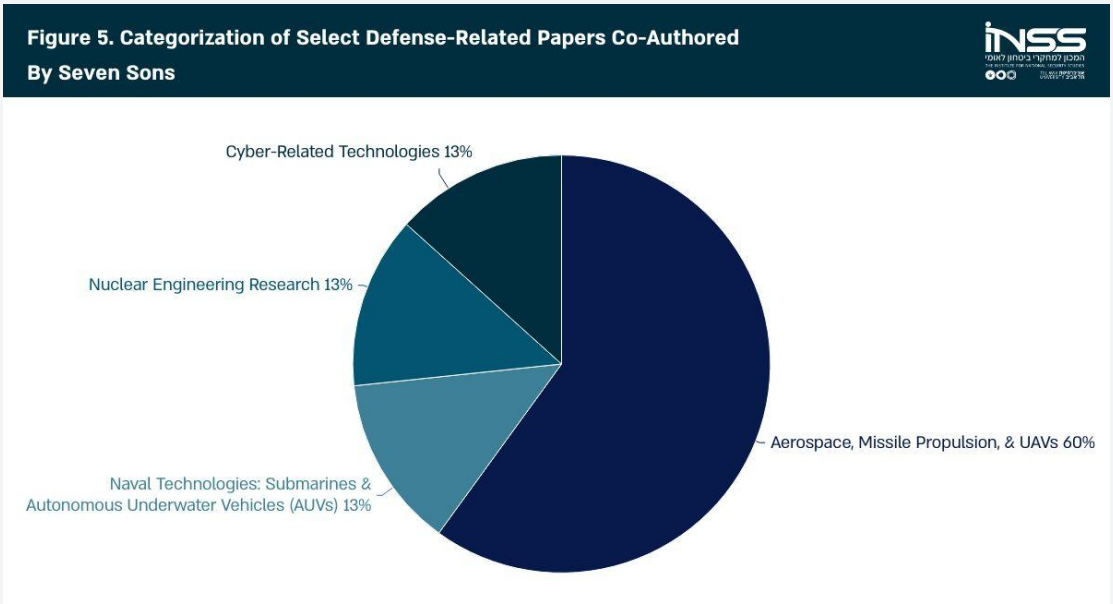

Aerospace, Missile Propulsion, and UAVs

A 2016 study by Iranian and Chinese researchers from SUT and NWPU used Computational Fluid Dynamics (CFD) to assess film cooling over curved surfaces, applicable to rocket engines, turbine blades, and other high-speed aerospace vehicles.[13]

In 2020, a research collaboration between NWPU and IAU developed a micromechanical model predicting the relaxation behavior of graphene/carbon fiber hybrid composites, applicable to UAVs and missiles requiring lightweight yet vibration-resistant structures.[14]

Also in 2020, a team from IUT, Yazd University, and HIT simulated flow over single and tandem square cylinders, applicable to stealth aircraft and UAVs where flow-induced noise and thermal signatures must be minimized.[15]

[13] A. Shalchi-Tabrizi et al., "Numerical Investigation of Wall Curvature Effects on Heat Transfer and Film Cooling Effectiveness," *Heat Transfer Research* 47, no. 6 (2016), https://doi.org/10.1615/HeatTransRes.2016010264

[14] Shan Li et al., "Developing a Nested Micromechanical Model to Predict the Relaxation Moduli of Graphene Nanoplatelets/Carbon Fiber Reinforced Hybrid Nanocomposites," *Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications*, 234 no. 3 (2020), https:/doi.org/10.1177/1464420719899971

[15] A. Sohankar et al. "Fluid Flow and Heat Transfer Around Single and Tandem Square Cylinders Subjected to Shear Flow," *Journal of the Brazilian Society of Mechanical Sciences and Engineering* 42, article no. 414 (2020), https://doi.org/10.1007/s40430-020-02484-2

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In 2022, a numerical study by researchers at SUT and NUAA evaluated spray cooling in high-concentration photovoltaic systems, relevant to thermal control systems in high-altitude UAVs and satellite platforms using solar power under concentrated loads.[16]

In 2023, a team from China's State Key Laboratory (SKL) of Explosion Science and Technology at BIT and the Inorganic Chemistry department of Iran's UMZ used atomic-scale simulations to map the thermal decomposition pathway of ammonium perchlorate (AP). The study applies to solid propellants, with implications for performance tuning and safe storage of missile systems.[17]

In 2024, researchers from the same institutions demonstrated that methyl viologen salts (MVX_2) drastically enhance the thermal decomposition of ammonium perchlorate, reducing its decomposition temperature and increasing heat output—relevant for storage, performance, and ignition sensitivity of solid propellants in missile propulsion systems.[18] Notably, on April 26, 2025, a blast at the IRGC-linked Sina yard in Bandar Abbas was reportedly triggered by poor thermal management of Chinese-supplied sodium or ammonium perchlorate, highlighting both Iran's shortcomings concerning solid rocket fuel oxidizer storage and the significance of the above-mentioned cooperative scientific research.[19] In early June, Iran reportedly ordered additional shipments of ammonium perchlorate from China.[20] CNN reported that since September, Iran received from China about 2,000 tons of sodium perchlorate, a missile fuel precursor, in multiple shipments, enough for roughly 500 ballistic missiles.[21]

Also in 2024, a team from SUT and NUAA analyzed spray combustion dynamics in swirl-free co-flow setups, applicable for the design of efficient, low-emission aeroengines or missile propulsion chambers.[22] It should be noted that NUAA is a pivotal player in China's aerospace and aviation research, partnering with several state-owned military conglomerates such as the Aviation Industry Corporation of China (AVIC) and the Aero Engine Corporation of China

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[16] Saeed Jowkar, et al., "Numerical Analysis in Thermal Management of High Concentrated Photovoltaic Systems with Spray Cooling Approach: A Comprehensive Parametric Study," *Solar Energy* 250 (2023), https://doi.org/10.1016/j.solener.2022.12.032

[17] Qingzhao Chu et al., "Reaction Network of Ammonium Perchlorate (AP) Decomposition: The Missing Piece from Atomic Simulations," *The Journal of Physical Chemistry C* 127, no. 27 (2023), https://pubs.acs.org/doi/10.1021/acs.jpcc.3c01666

[18] Samie Salehi et al., "Superb Enhancement of Thermal Decomposition of Ammonium Perchlorate in the Presence of Methyl Viologen Salts: A TG-DSC/MS and Kinetic Study," *Journal of Analytical and Applied Pyrolysis* 178 (2024), https://doi.org/10.1016/j.jaap.2024.106415

[19] Bethany Halford, "The Chemistry Behind the Iran Port Explosion," C&EN, April 29, 2025, https://cen.acs.org/safety/industrial-safety/chemistry-behind-Iran-port-explosion/103/web/2025/04

[20] Laurence Norman, "Iran Orders Material From China for Hundreds of Ballistic Missiles," *Wall Street Journal*, June 5, 2025, https://www.wsj.com/world/iran-orders-material-from-china-for-hundreds-of-ballistic-missiles-1e874701

[21] Melissa Bell and Gianluca Mezzofiore, "Western Intelligence Says Iran Is Rearming Despite UN Sanctions, With China's Help," CNN, October 29, 2025, https://edition.cnn.com/2025/10/29/middleeast/iran-rebuilding-ballistic-weapons-program-intl

[22] Saeed Jowkar et al., "Investigation of Flame Structure and Emission Production: Combustion Modeling of Co-Flow Interaction with Spray," *Physics of Fluids* 36 (2024), https://doi.org/10.1063/5.0195451

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(AECC), and contributing to major national aerospace projects like the Chang'e-3 lunar explorer.[23]

That same year, researchers from IAU and NUAA modeled the behavior of graphene-reinforced spherical caps under supersonic flow, directly applicable to aerospace structures under extreme aerodynamic stress, such as payload shrouds (missile nose cones) and UAV control surfaces.[24]

Again in 2024, an experimental study by UT, BASU, and NWPU showed that carbon nanotube (CNT)-reinforced epoxy composites significantly improve mechanical performance under medium-strain-rate loading. These materials are well-suited for UAV bodies, missile skins, and armor components where weight, durability, and impact resistance are critical.[25]

Nuclear Engineering Research

In 2020, researchers from Iran's University of Kashan and China's NUAA used 3D CFD modeling to analyze hybrid nanofluid flow in an annular setup with hot and cold rods—applicable to reactor core cooling and thermal management.[26]

Also in 2020, a team from IUT and HIT examined flow over rectangular cylinders under varying aspect ratios and Reynolds numbers, potentially relevant for heat transfer around non-circular reactor components.[27]

Naval Technologies: Submarines and Autonomous Underwater Vehicles (AUVs)

In 2022, a team from IHU, AUT, and HIT analyzed pre-swirl stators to reduce torque-induced roll in underwater vehicles, applicable for enhancing stability and acoustic stealth in submarine and AUV operations.[28]

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[23] Nanjing University of Aeronautics and Astronautics, "About NUAA," NUAA Official Website, January 2019, http://www.nuaa.edu.cn/479/list.htm (Archive)

[24] Y. Y. Wei et al., "On Nonlinear Dynamic Analysis of Hyperbolic Tangent FG-GPL-Reinforced Shallow Spherical Cap Under Supersonic Flow," *Waves in Random and Complex Media*, https://doi.org/10.1080/17455030.2024.2368865

[25] Reza Yazdanparast et al., "Dynamic Mechanical Behavior of CNT-Reinforced Epoxy Under Medium-Strain Rate: A Comparative Study," *Composite Structures* 344 (2024), https://doi.org/10.1016/j.compstruct.2024.118343

[26] Aysan Shahsavar Goldanlou et al., "Numerical Investigation on Forced Hybrid Nanofluid Flow and Heat Transfer Inside a Three-Dimensional Annulus Equipped with Hot and Cold Rods: Using Symmetry Simulation," *Symmetry* 12, no. 11 (2020), https://www.mdpi.com/2073-8994/12/11/1873

[27] A. Mashhadi et al., "Flow over Rectangular Cylinder: Effects of Cylinder Aspect Ratio and Reynolds Number," *International Journal of Mechanical Sciences* 195 (2021), https://doi.org/10.1016/j.ijmecsci.2020.106264

[28] Alireza Nadery et al., "Pre-Swirl Stator Investigation with Simultaneous Consideration of Reducing Underwater Vehicle Roll and Increasing Propulsion Efficiency," *Journal of the Brazilian Society of Mechanical Sciences and Engineering* 44, article no. 480 (2022), https://link.springer.com/article/10.1007/s40430-022-03797-0

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In 2025, researchers from IHU, AUT, and HIT conducted a CFD study comparing toroidal and conventional propellers, relevant for stealth and endurance in submarines and AUVs.[29]

Cyber-Related Technologies

In 2022, researchers from HIT, UMZ, and SUT developed a hybrid Cuckoo Particle Swarm algorithm to optimize task scheduling in cloud systems, applicable to secure and resilient military cloud infrastructure.[30]

In a 2023 study, a team from Tafresh University and the Moscow State–BIT joint venture University in Shenzhen proposed an event-triggered cascade control system to resist hybrid cyberattacks, valuable for securing defense communications and critical cyber-physical systems.[31]

Iranian Researchers Embedded at Chinese National Defense Universities

Among the contributing authors to the 2022 cyber-related study mentioned above was Amir Javadpour, whose academic path began at the University of Tehran and continued at Guangzhou University at the doctoral level. His recent co-authorships with researchers at the Harbin Institute of Technology (HIT)—one of China's leading cyber warfare institutions—highlight his deeper integration into China's national defense research network.[32]

Javadpour is not alone. This research identified several Iranian researchers working within China's "Seven Sons of National Defense," institutions directly tied to military advancement. One such figure is Saeed Jowkar, an Iranian aerospace engineer educated at Sharif University of Technology and K. N. Toosi University of Technology, both in Tehran. Now a postdoctoral fellow at Nanjing University of Aeronautics and Astronautics (NUAA) in China, Jowkar is affiliated with the College of Aerospace Engineering and has published extensively on combustion dynamics and propulsion systems.[33] His research is closely linked to the State Key Laboratory of Mechanics and Control of Mechanical Structures—an institution central to China's work on missile and hypersonic technologies.[34]

These specific cases illustrate a broader trend of Iranian scientists embedding within Chinese defense R&D through graduate studies, fellowships, or talent programs—reinforced by the 2021 Comprehensive Strategic Partnership agreement, which prioritizes increased bilateral

[29] Alireza Nadery et al., "Numerical Investigation of Toroidal Propeller: Hydrodynamic and Hydroacoustic Study," *Ships and Offshore Structures* (2025), https://doi.org/10.1080/17445302.2025.2477771
[30] Hadi Zavieh et al., "Task Processing Optimization Using Cuckoo Particle Swarm (CPS) Algorithm in Cloud Computing Infrastructure," *Cluster Computing* 26 (2023), https://link.springer.com/article/10.1007/s10586-022-03796-9
[31] Ali Kazemy and Ramasamy Saravanakumar, "Event-Triggered Networked Cascade Control Systems Design Subject to Hybrid Attacks," *Mathematical Methods in the Applied Sciences* 47, no. 4 (2024), https://doi.org/10.1002/mma.9767
[32] "Amir Javadpour," https://dl.acm.org/profile/99661360001
[33] Personal homepage of Saeed Jowkar, NUAA, 2023, https://web.archive.org/web/20250325194403/http://faculty.nuaa.edu.cn/aeedowkar/en/index.htm
[34] See Publication 14 in the Appendix I.

academic cooperation and research partnerships. Within our dataset of 753 joint publications, about seventy Iranian researchers were listed as affiliated with China's Seven Sons universities. Other Iranian researchers embedded in third countries' universities also participated, such as those from Vietnam, France, Canada, Iraq, and others.

Summary of Findings

Out of the 20,875 joint academic articles coauthored by Chinese and Iranian researchers and published in English between 2006 and 2025, a total of 753 were identified as collaborations specifically involving China's "Seven Sons of National Defense" and Iranian universities, some of which are defense-linked. Naturally, many more joint articles exist between Iran's defense-related institutions and China's sprawling defense-related academia, beyond the Seven Sons universities. Among the 753 publications, our analysis identified Harbin Institute of Technology (HIT), Northwestern Polytechnical University (NWPU), and Nanjing University of Aeronautics and Astronautics (NUAA) as the three leading Chinese institutions involved. On the Iranian side, the University of Tehran, various branches of the Islamic Azad University network, and Amirkabir University of Technology were the top three contributors. Collaboration grew steadily across the past decade, with a sharp rise in annual co-authored publications during 2020–2021, peaking in 2022 before declining in subsequent years for reasons that remain unclear.

Out of the 753 articles, 15 showed specific potential defense applications across four domains: Nuclear Engineering; Aerospace, Missile Propulsion, and UAVs; Naval Technologies: Submarines and Autonomous Underwater Vehicles (AUVs); and Cyber-Related Technologies. These examples indicate contributions to both China's and Iran's respective defense ecosystems, including advances in solid propellants; composite materials for aircraft, UAVs, and missile systems; stealth-enhancing naval propulsion; reactor thermal management; and cyber resilience tools for military systems. The technologies in question enhance performance, stability, or survivability capabilities highly relevant to modern defense platforms. Collectively, these 15 articles reveal a targeted pattern of collaboration in areas of strategic importance to both countries' military-civil fusion and modernization agendas.

This small sample of joint research papers demonstrates clear dual-use applicability. While not all studies are overtly military in nature, the military-civil fusion strategies pursued by both countries suggest that research co-authored by defense-related institutions is highly likely to support national and shared defense efforts.

Conclusion: Implications and Recommendations

The co-authored academic publications examined in this study indicate sustained research collaboration efforts between China and Iran. By enabling technology transfer and knowledge exchange between defense-linked institutions, this two-way collaboration channel may accelerate both countries' capabilities in facing their respective strategic rivals.

For both countries, the United States remains their primary military adversary—China facing US INDOPACOM and Iran facing US CENTCOM. Conversely, China and Iran are regarded as top-

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tier threats by the United States and Israel, respectively. Consequently, dual-use scientific collaboration across defense-relevant fields carries potential risks for the national security of both the United States and Israel. This research underscores not only the growing technological cooperation between China and Iran but also the potential strategic alignment with other adversarial states such as Russia and North Korea—posing a broader challenge to Western allies in both Europe and the Indo-Pacific.

A particular concern is the role of basic research. Although often considered benign and seldom well protected, basic research forms the foundation for applied military innovation. Chinese universities—particularly high-risk institutions with defense ties—may serve as conduits for Iran to access sensitive knowledge and capabilities, including those of Western origin, thereby circumventing traditional export controls and arms transfer restrictions. This raises urgent questions about research security and the prudence of continued US and allied academic cooperation with such institutions.

Additionally, American and Israeli engagement or collaboration with Chinese institutions outside of the "Seven Sons" should also be approached with caution. For example, Xi'an Technological University (XATU)—which holds top-secret security credentials and is classified by the Australian Strategic Policy Institute (ASPI) as "very high risk"[35]—was identified in this study as an additional contributor to Sino-Iranian research.[36] Given these risks, American and Israeli academia should exercise increased caution in collaborations with such institutions, particularly where there is a high risk of military-civil fusion or involvement with sanctioned actors.

Finally, the academic nature of these collaborations may enable Iran to circumvent conventional restrictions on military technology transfers, reinforcing the importance of monitoring military-civil fusion pathways. China's willingness to collaborate with Iranian universities tied to Iran's defense ecosystem—combined with overt material support for Iran's offensive capabilities, such as missile propellant precursors and UAV components—signals broader challenges for global non-proliferation and strategic technology containment.[37]

Recommendations:

Enhance monitoring and screening of academic and technological exchanges. Bolster open-source intelligence (OSINT) tracking of joint Sino-Iranian research by academia, NGOs,

[35] China Defence Universities Tracker, https://unitracker.aspi.org.au/universities/xian-technological-university/

[36] A. Sohankar et al., "Fluid Flow and Heat Transfer Around Single and Tandem Square Cylinders Subjected to Shear Flow," *Journal of the Brazilian Society of Mechanical Sciences and Engineering* 42, article no. 414 (2020), https://link.springer.com/article/10.1007/s40430-020-02484-2

[37] "The Departments of Treasury and Justice Take Action Against Iranian Weapons Procurement Network," Press Release, April 1, 2025, https://home.treasury.gov/news/press-releases/sb0066; Daniel Allen et al., "What is Iran Doing with 1000 Tons of Sodium Perchlorate From China," *The Diplomat*, February 4, 2025, https://thediplomat.com/2025/02/what-is-iran-doing-with-1000-tons-of-sodium-perchlorate-from-china/

governments, and intelligence communities. Priority should be given to monitoring universities closely affiliated with their respective defense sectors and military R&D.

Expand access to advanced research tools. Encourage the availability of platforms such as Data Abyss to academia, media, and NGOs. This would empower stakeholders to conduct their own due diligence and expand actionable knowledge.

Educate and inform stakeholders about risks, implications, and safeguards. Provide tools, data, information, and best practices to increase awareness, capabilities, and resilience among academics, media, officials, and civil society in the West.

Reinforce academic research security and screening measures. Federal and governmental funding should be conditioned on institutional compliance with guidelines discouraging collaboration with high-risk Chinese and Iranian universities, particularly in sensitive dual-use areas.

Identify and map institutions and labs that serve as key nodes in China–Iran military-civil research fusion. Such mapping can inform targeted sanctions, visa restrictions, and technology-denial policies.

Increase defensive R&D collaboration with like-minded partners. Promote joint US–Israeli and broader multilateral R&D initiatives with Western partners to compete against Iran, China, Russia, and North Korea's joint efforts and emerging technologies and capabilities.

Publicize and deter. Consider selectively exposing dual-use collaborations to deter further proliferation through reputational costs, especially involving sensitive military applications or high-risk institutions.

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List of Acronyms

AECC – Aero Engine Corporation of China

AP – Ammonium Perchlorate

ASPI – Australian Strategic Policy Institute

AUT – Amirkabir University of Technology

AUVs – Autonomous Underwater Vehicles

AVIC – Aviation Industry Corporation of China

BASU – Bu-Ali Sina University

BIT – Beijing Institute of Technology

BUAA – Beihang University of Aeronautics and Astronautics

CENTCOM – United States Central Command

CFD – Computational Fluid Dynamics

CNT – Carbon Nanotubes

CRINK – geopolitical grouping of China, Russia, Iran, and North Korea

HEU – Harbin Engineering University

HIT – Harbin Institute of Technology

IAU – Islamic Azad University

IHU – Imam Hossein University

INDOPACOM – US Indo-Pacific Command

IRGC – Islamic Revolutionary Guard Corps

IUT – Isfahan University of Technology

MCF – Military-Civil Fusion (军民融合)

MODAFL – Ministry of Defense and Armed Forces Logistics

MVX_2 – Methyl Viologen Salts

NJUST – Nanjing University of Science and Technology

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NUAA – Nanjing University of Aeronautics and Astronautics

NWPU – Northwestern Polytechnical University

OSINT – Open-source intelligence

SDSTIFDS – Strategic Document on Science, Technology, and Innovation in the Field of Defense and Security

SKL – State Key Laboratory

SUT – Sharif University of Technology

UAV – Unmanned Aerial Vehicle

UMZ – University of Mazandaran

UT – University of Tehran

XATU – Xi'an Technological University

Appendix I: Detailed Findings: Table of 15 Joint Research Publications

See Excel Table "Annex1_FullData_Readable_OnePageTable.xlsx"

Appendix II: Referenced Military-Civil Fusion and Modernization Strategies

China—Military-Civil Fusion Strategy (MCF)

China's Military-Civil Fusion (MCF) strategy (军民融合) is a state-led initiative aiming to eliminate existing barriers between civilian and defense sector S&T research, ensuring that private innovations can directly contribute to China's military modernization.[i] The MCF strategy serves to promote and facilitate the transfer of such innovations in emerging technological fields such as artificial intelligence (AI), quantum computing (QC), aerospace engineering, and so forth to the People's Liberation Army (PLA) and parallel institutions that collectively form China's security establishment.[ii] The Ministry of Industry and Information Technology (MIIT) and the State Administration of Science, Technology and Industry for National Defense (SASTIND) are jointly responsible for publishing the annual *Catalogue of Recommended Technology Products for Civilian Participation in the Military* (军民融合推荐技术产品目录), outlining the specific technologies to be targeted for military-civil fusion as they emerge.[iii]

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Iran—SDSTIFDS

The *Strategic Document on Science, Technology, and Innovation in the Field of Defense and Security* (SDSTIFDS) is a policy document approved by Iran's Supreme Council of the Cultural Revolution (SCCR) on February 23, 2021. The SDSTIFDS closely parallels China's MCF strategy, in that it aims to systematically integrate advanced civilian technologies into Iran's military and defense apparatus.[iv] This document mandates that Iranian private enterprises, research laboratories, universities, and others engaged in relevant research concerning emerging technologies align their outputs with Iran's national defense institutions.[v] Similar to China's MIIT and SASTIND coauthored annual catalogue identifying specific technologies of interest for military-civil fusion, Iran's SCCR outlines within the SDSTIFDS policy document a list of critical and emerging technologies subject to oversight by relevant defense organizations and governing bodies, according to the guidelines in Article 6 of the document.[vi]

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[i] http://journal.bit.edu.cn/sk/cn/article/doi/10.15918/j.jbitss1009-3370.2016.0515
[ii] https://archive.fo/MkSK3
[iii] https://www.hnjmrh.gov.cn/newweb/newinfo/detail/6590/
[iv] https://rc.majlis.ir/fa/law/show/1651177
[v] Ibid.
[vi] Iran's **Supreme Council of the Cultural Revolution** (SCCR), "Article 6" of SDSTAFDS, [in Persian] Archived