Despite risks, EU continues to fund research with Chinese military-linked universities

A Science|Business investigation finds five ongoing EU research projects that include China's 'Seven Sons of National Defence' universities, in network security, heat transfer and drones. No comment from Brussels, but experts warn of danger

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Despite efforts to prevent EU technology leaking to China's military, the European Commission is continuing to fund at least five research projects involving some of China's top military-linked universities.

The projects, research by Science|Business finds, involve heat transfer, data security and other technologies that could have dual civilian and military use. China's participation includes four of its so-called Seven Sons of National Defence, top-ranked universities controlled by the industry ministry and producing most technical graduates that work for its state defence industry. Under standard EU rules, the Chinese get their own funding for their work in the projects, but as official "participants" they can share in the European research, meetings and staff exchanges.

The projects in question are five on-going Marie Skłowdowska Curie Actions (MSCA), that facilitate staff exchanges and network-building among research institutions. Four of the five were started under the EU's old Horizon 2020 programme, but a fifth began only this March under the Horizon Europe programme. They include €437,000 to improve heat dissipation in electronic devices, €639,400 for low-carbon cooling systems, and €1.1 million for electric motors. Two projects involve using drones to network driverless cars: €340,400 for the security of the networks, and €1.1 million to avoid accidents.

'Significant risk'

Science|Business shared the list of projects with several China experts. With these projects, "the risk of research results being redirected to defence applications in China is significant," said Rebecca Arcesati, a specialist on Chinese technology at Berlin-based think tank Mercator Institute for China Studies (Merics). Given that EU research policy towards China is supposed to be more wary than in the past, she called it "remarkable" that one of the projects began in March.

Indeed, in March Commission President Ursula von der Leyen told the European Parliament that, while scientific and technology cooperation with China should continue, it must be handled in a way that doesn't benefit its military. "We need to ensure that our companies' capital, their expertise, their knowledge, are not used to enhance the military and intelligence capabilities of those who also are our systemic rival," von der Leyen said.

Science|Business found the projects in public EU databases, but Commission officials in multiple departments over the past few months declined repeated requests for public comment. When pressed for more information, an official spokesperson emailed Science|Business only a summary of already-public information about China policy and normal MSCA procedures. All the projects, though ongoing, were authorised under grant policies that preceded Brussels' latest policy pronouncements on China – so it's possible they would not have been authorised today, as China-wariness mounts.

Some of the European project partners, when contacted by Science|Business, indicated that neither they nor Commission officials had seen any problem with the projects. They said they complied with

export controls and Commission grant terms in effect at the time they were authorised. Further, they said, Chinese expertise in their fields is valued, and the research is at too early a stage to have immediate practical uses.

“The TRL (technology readiness level) is not that high, for military applications,” explained one project leader, Ali Koşar at Turkey’s top-rated university, Sebanci in Istanbul. Further, he said, the Commission’s grant evaluators never raised the China issue.

But looking more deeply into the projects, China specialists consulted by Science|Business said, can raise some red flags – at least, in light of recent EU policy towards China.

The Seven Sons

One frequent Chinese participant in these projects, Beihang University in Beijing, is a huge technical university founded in 1952 as an aeronautics and astronautics institute. It has been central to China’s space programme, for which it designed China’s best-known spacecraft, Shenzhou. With 31,000 students, it is among the top 200 engineering and technical universities in the world, according to the latest Times Higher global rankings, and has long had partnerships across the globe – including a joint engineering graduate programme with France’s École Centrale Paris.

It also hosts at least eight defence labs working on areas like aircraft engines and navigation. More than a fourth of its graduates get hired by state defence companies, according to the Australian Strategic Policy Institute (ASPI), a think tank that has mapped China’s university-defence links.

And it is one of the ‘Seven Sons of National Defence’ universities – a Chinese government label meaning that, unlike civilian universities, Beihang reports to China’s Ministry of Industry and Information Technology, which also controls the country’s defence industry. According to a Georgetown University report, it and its six brother-universities together provide about three-fourths of the technical graduates recruited by China’s state defence companies. Other universities in that group include Northwestern Polytechnical University, Harbin Institute of Technology and Nanjing University of Aeronautics and Astronautics.

In 2020, the Trump Administration banned US visas for graduate students from those or other military-supporting universities. The following year, the Biden Administration softened the order by giving the State Department more latitude to decide when and how to enforce it.

Still, “to be collaborating with these schools [the Seven Sons] is quite risky,” says Jeff Stoff, a former China analyst to US security and defence agencies, and currently head of a non-profit near Washington called the Center for Research Security & Integrity.

The universities do both civilian and military work, but “their primary missions are to find defence applications,” Stoff says. A recent report he authored on German academic collaboration with China puts Beihang and its peers into a “high-risk” category that requires extra caution for western partners. But it acknowledged that “different nations may have different risk tolerances or priorities regarding specific technology development.”

Indeed, attitudes towards Chinese research collaboration vary widely across Europe, and have been shifting at light speed. A decade ago, both Washington and Brussels encouraged R&D links with Beijing. But then came the Trump administration in 2016, with its demonising of China and a series of (mostly unsuccessful) investigations into Chinese-American scientists. By 2019, the EU started paying closer attention to Chinese competition and allegations of intellectual property theft. In 2021, it called for “rebalancing” its scientific relations with China. And then, in March, came von der

Leyen's declaration that the EU must "de-risk" its China relations. Among other things, that means keeping EU inventions away from China's military.

Fast policy-making, slow paperwork

But while the policy news headlines flash by fast, the grant-making machinery inside the Commission grinds more slowly – and that may be a factor in these projects.

Horizon operates under legislation written every seven years, and its specific funding plans every two years – so there is a very long lead-time between policy decision and grant contracting. In the days of warmer EU-China relations, under the Horizon 2020 programme from 2014 to 2020, the Commission authorised Chinese organisations to participate with their own funding in EU projects 609 times, amounting to 0.34% of all participations from all countries, according to the EU's Horizon database. But since 2021, as EU-China relations chilled, the number has declined under the current Horizon Europe programme to 111 Chinese participations, or 0.25%. For the most part, these are uncontroversial collaborative studies into climate change, agriculture and health, and involve famous civilian universities such as Tsinghua or Fudan.

There's usually an administrative delay of many months between a new policy and the grants implementing it – though the Commission can speed this up, as happened with COVID-19 research in 2020. The usual grant paperwork further slows the process. An application responding to a Commission grant programme gets sent to a group of paid, outside experts for evaluation. The applicants must also show they comply with standardised ethical requirements, including no known possibility of dual military and civilian use. But for the most part, it's up to the applicants to self-certify that they're following all the rules. Further complicating matters: policy for MSCA projects is set by one part of the Commission, the education directorate, while the grant-writing happens in another, the Research Executive Agency.

Exactly what happened in these Chinese projects isn't clear, and Commission officials won't comment publicly. But the public records show four of the five MSCA projects examined by Science|Business were authorised under the old Horizon 2020 programme procedures, and have many months yet to run. A fifth, led by Sabanci in Turkey, began under the current Horizon Europe programme, pursuant to a call for proposals issued in 2021. After months of paperwork, the project only got started this March and is expected to run four years.

Quantum, too?

The Science|Business analysis focused only on ongoing Horizon projects involving the Seven Sons universities – the most obvious risk to von der Leyen's efforts to keep EU discoveries out of China's warplanes and cyber-war tools. But, poking around in the Commission's Horizon databases, there are other projects involving Chinese civilian universities that can raise questions.

One such civilian project involves quantum technologies – considered so sensitive that the Commission in 2021 tried to block EU member states from working even with their neighbours in the UK, Switzerland and Israel on close-to-market quantum R&D.

With about €250,000 in funding from Horizon Europe, the Aragon Institute of Nanoscience and Materials in Spain last November started a project to create a "novel hybrid quantum architecture" with the University of Science and Technology of China (USTC). USTC is not one of the Seven Sons, but the leader of its quantum science enterprise has partnered with the Chinese defence industry and explored quantum's defence potential, including quantum radar to detect stealth aircraft,

according to ASPI. It also has a defence laboratory that specialises in cryptography, among other things.

Over the course of the HyQuArch MSCA project, which runs to October 2025, the Spanish and Chinese partners will work on new ways to eliminate disruptive noise in quantum computers, and ways to "boost the computational power of a quantum processor." "Collaboration with private stakeholders will ensure integration in practical devices," says the project description.

The Aragon Institute did not respond to a request for comment.