

Breaking boundaries to spur innovation

Shanghai University is one of the fastest-growing universities in China.



Founded in 1922, Shanghai University has kept pace with the city's rapid growth, continually reinventing itself through mergers with many other universities in Shanghai. In line with national development strategies and regional business needs, SHU has taken a unique route to boost interdisciplinary interactions, forged a strong academic reputation, and become one of the fastest-growing universities in China.

"We focus on the need for innovation and solutions in industry at regional and national levels," says Changsheng Liu, SHU's president. "This is evident in our motto: 'Ever vigilant and never settle'. We prioritize interdisciplinary interactions and innovation in our research and education."

Interdisciplinary integration

SHU's commitment to interdisciplinary integration began 20 years ago when Weichang Qian, a renowned physicist and mathematician and the first president of the revamped SHU, set about

breaking down disciplinary silos. Since then, SHU has established a model of interdisciplinary programmes that is now increasingly prevalent across the country, enabling undergraduates to explore a range of interests, rather than declaring majors during their first two years of college.

Qian's endeavour inspired later generations of SHU researchers to reinforce innovation. SHU has gathered researchers in machinery, control, communication, mechanics, materials, computer science, and artificial intelligence to develop a series of unmanned surface vehicles (USVs), including JingHai 1, a national first. These USVs have been widely used in China's ocean research, coastal patrols, archaeological surveys of ancient ships, and an Antarctic survey.

SHU is pooling various academic resources to spur innovation. An example is the joint establishment of the School of Microelectronics and the Integrated Circuit Innovative Research Institute with the

Chinese Academy of Sciences. Partnering with premier academic institutions, the university has created a research chain ranging from preparing materials and microelectronic components to designing microelectronic systems, and developing wearable electronic gadgets and flexible screens for smartphones.

The university also collaborates with industry and takes research out of its laboratories to achieve real-world impacts. Ecologists at SHU are applying materials sciences to reduce pollution and carbon emissions. They have developed novel graphene-based materials and technology to treat and recycle high-salinity wastewater, and absorb volatile organic compounds from industrial emissions. The work has resulted in major collaborations between SHU and companies such as China Shipbuilding Industry Corporation and Sinopec.

Biotechnology is another key focus. Brain-machine interfaces to connect humans and computers developed by a team

at SHU are used in hospitals in Shanghai to help stroke patients and improve the efficiency of rehabilitation training through simulating motor skills imagery. SHU has also made a series of leading scientific research achievements in biomaterials for tissue repair, nano-biomaterials, and imaging materials. Several biomedical scientific and technological achievements have been translated into medical devices.

Thriving with the city

SHU has built research strengths in various fields. According to the latest Essential Science Indicators (ESI) rankings, it has 12 disciplines ranked among the global top 1%, with Engineering Science placed among the top 0.1%. In 2022, SHU was also named a Double First Class national university. The Double First Class initiative plans to build numerous world-class universities and disciplines by the end of 2050.

A key university under the direct administration of the Shanghai Municipal Government, bolstering and

diversifying the city's economy is a major goal of SHU. It intends to expand its research output by recruiting more post-graduate students, as well as contribute more to the local community. SHU is now developing an innovation park concept near its campus to support cutting-edge research and launch start-ups.

To further promote integration and innovative growth for regional development, SHU has drawn up a blueprint for action and launched the 'Dual-five Strategy' — building cross research disciplines in 10 emerging fields, with 5 in technology and 5 in social sciences: microelectronics, artificial intelligence, biomedicine, sustainable energy, quantum technology, urban social governance, archaeology and cultural preservation, Shanghai culture, art technology, and digital economy.

"Turning 100 is just the beginning of a new chapter for SHU," says Liu. "We will continue to spur integration and advance innovation in Shanghai and the world." ■



CHANGSHENG LIU

President of Shanghai University

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