

An innovative path to talent cultivation

Drawing on rich resources, **THE UNIVERSITY OF CHINESE ACADEMY OF SCIENCES** is exploring bold ways to promote talents for the future.

The University of Chinese Academy of Sciences (UCAS) is relatively new among the country's 3,000 universities and colleges, and has developed a style of its own. Founded 43 years ago, UCAS has taken advantage of the rich research resources from the Chinese Academy of Sciences (CAS) and achieved an excellent track record in graduate education.

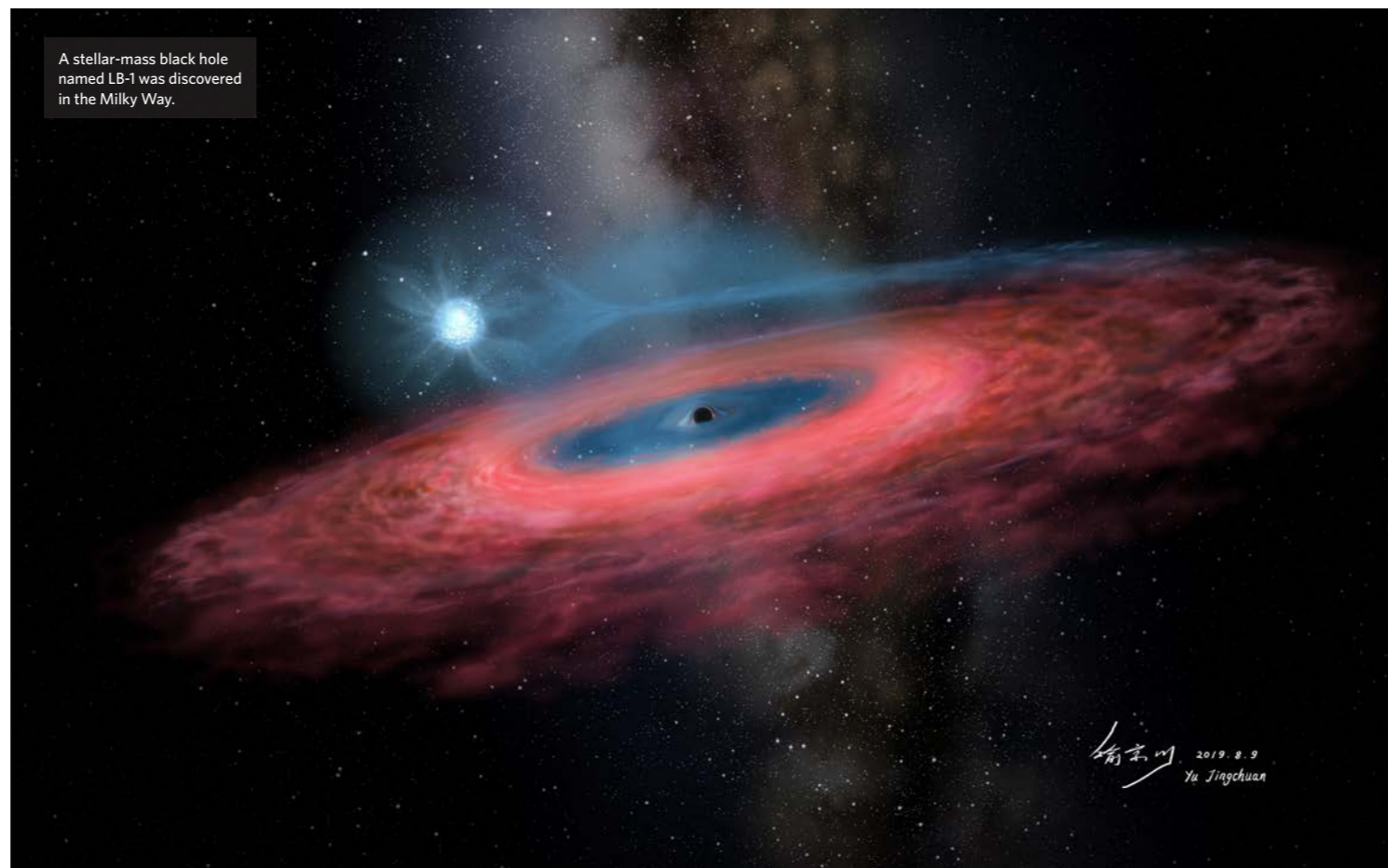
LEVERAGING THE LATEST FACILITIES FROM CAS, STUDENTS AT UCAS ARE ABLE TO CONDUCT STUDIES IN MANY FRONTIER FIELDS.

INTEGRATING RESEARCH AND EDUCATION

UCAS's success can be attributed to its comprehensive system that integrates research and education, explains Yanfen Wang, UCAS executive vice president, and a renowned soil ecologist. Each of its 41 colleges

is hosted by a CAS institute of outstanding research capabilities, and supported by several other institutes in the same discipline. Deans of the colleges are either directors of hosting institutes or notable scientists, such as CAS members. Leveraging the latest facilities from CAS, students at UCAS are able to conduct studies in many frontier fields.

Jifeng Liu, an astronomer at the National Astronomical Observatories of CAS, and a professor in the School of Astronomy and Space Sciences at UCAS, led an international research team using China's Large Sky Area Multi-Object Fibre Spectroscopic Telescope to study stars orbiting an invisible object. Five UCAS students were heavily involved in this project and undertook data analysis and studies using the telescope, under Liu's supervision. This endeavour paid off when they spotted a stellar-mass black hole with a mass far beyond the predicted upper limit of around 20 solar masses. This discovery, published in *Nature*



in November 2019, raises questions about previous theories on how stars evolve, and how such massive black holes form.

This illustrates the importance of hands-on research for UCAS students, while they develop their capability for innovation by working with their supervisors. "A majority of our students pursue scientific research and development as a career. Many of them have become leaders in their fields," says Wang.

TALENTS FOR THE FUTURE

UCAS has been adapting its education system to ensure the talented graduates are able to meet the challenges of the future.

"The demand for skills in each era is different, and the construction of disciplines in each era is also different. With a forward-looking strategy, UCAS has been reallocating its resources to cultivate talents that will be desperately needed in the future," explains Wang.

The research focus of artificial intelligence (AI) is generally considered an extension of the field of computer science or information science. Based on a thorough study of the field's potential future development direction, at UCAS, AI has become a central pursuit through its association with a cluster of other disciplines such as mathematics, computer science, automation

control, sociology, philosophy, psychology, ethics and even brain science. "With this understanding, we need to make sure our graduates have a range of talents in the field of AI to meet future needs," says Wang.

This interdisciplinary approach is common at UCAS. Another example is the establishment of the School of Engineering Sciences, integrating engineering technology, engineering philosophy, engineering management, psychology, and other disciplines, to cultivate broad talents.

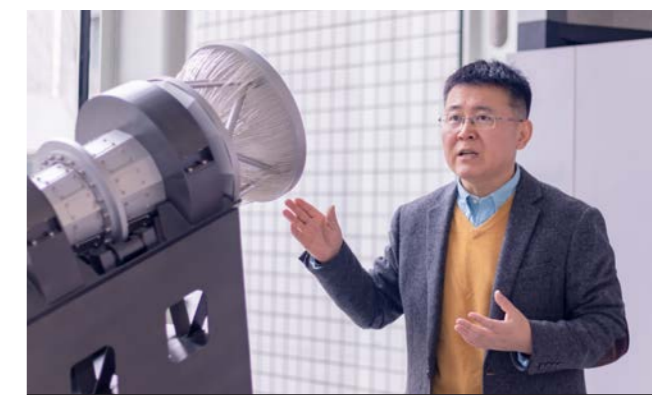
UCAS also encourages its students to choose interdisciplinary courses according to their interests and

expectations. "We have torn down all boundaries. No student in UCAS has the same course list as another. Through these changes, we hope they can have a solid knowledge base on which they can develop their future careers," explains Wang.

A NEW UNDERGRADUATE PROGRAMME

Focusing mainly on graduate education, UCAS is also piloting a new undergraduate programme. In the first and second year, students take common core courses, which lay the foundation for their choice of specific areas in the future.

In this phase, UCAS also provides both physical and mental health courses to help



UCAS professor, Jifeng Liu, and his team, used the LAMOST optical telescope to search for black holes in the Milky Way, with valuable contributions from five UCAS students.



An interdisciplinary model has been developed at UCAS to cultivate AI talents.

students develop a good work-life balance. It also provides basic courses in mathematics and physics, regardless of their future plans for a major.

The third category of core courses are languages, including writing for training in critical thinking skills. "We want our students to learn how to discuss and debate with others, how to express themselves and how to ask questions, which is the most important priority," says Wang. Students also learn English to develop an international perspective, and a computer language so they are able to communicate with machines.

In the third year, students will choose a major according to their interests. They can try out several options, for example

mathematics, physics or life sciences, to find where their skills and interests lie. In the fourth year, they engage in real research at CAS labs, or at the labs of UCAS's overseas partner universities.

UCAS strives to become a top university that attracts outstanding scientists and talented students from home and abroad. "We hope the talents that UCAS cultivates can make important contributions to the advancement of science and technology for a better world," Wang says. ■

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