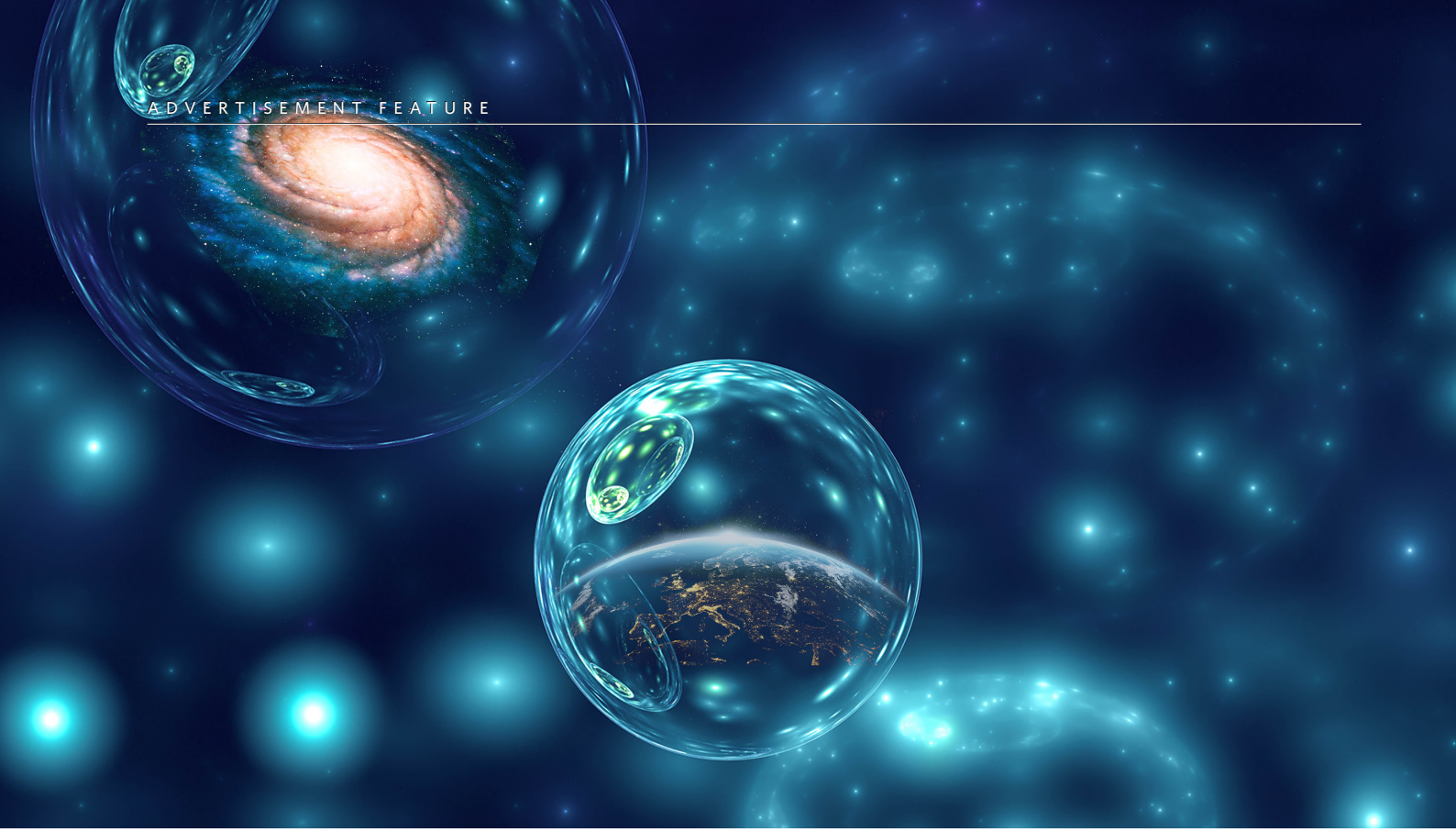

LUMINARIES OF THE MICROSCALE

How HEFEI NATIONAL LABORATORY FOR PHYSICAL SCIENCES AT THE MICROSCALE was set up to make quantum leaps in strategic areas of science.

The researchers at Hefei National Laboratory for Physical Sciences at the Microscale (HFNL) are accustomed to international attention. In recent years, the Chinese institution has been in the spotlight as the birthplace of the world's first sub-nanometre Raman imaging, first single-protein spin resonance spectroscopy, first satellite quantum communication, and the fastest quantum computers.

"HFNL is a centre for interdisciplinary research," explains its director, Yi Luo. HFNL was officially launched in 2003 by the Ministry of Science and Technology of China, with the aim of bringing together the best minds, management and resources from the University of Science and Technology of China (USTC), one of China's most prominent universities. Its mission is to provide the fundamental solutions at the microscale to strategically important emerging fields; nanotechnology, biotechnology, information technology, and cognitive science (NBIC).

ITS MISSION IS TO PROVIDE FUNDAMENTAL SOLUTIONS AT THE MICROSCALE TO EMERGING FIELDS

In the early 2000s, it was hard to grasp that photon properties might be practically teleported from Earth to a satellite, as HFNL first did in 2016, explains Luo. Today, manipulation on the microscale, ranging from atoms to proteins, is widely recognised as being a precursor to huge technological and medical advances.

HFNL researchers have been steadily contributing with breakthroughs in organic plastic alternatives (see 'Mimicking nature's toughest materials'), high temperature iron-based superconductors (see 'An iron grip on superconductivity') and tumour immunotherapy (see 'The liver's killer instincts'), to name just a few.

HFNL is also now one of three key national laboratories within one of the largest scientific organisations in the world, the Chinese Academy of Sciences (CAS). Its 11 research divisions are at the cutting edge of optical and cold atom physics, single molecular and low-dimensional physics and chemistry, nanomaterials, catalysis and energy conversion, as well as molecular and cell biophysics, neuroscience, molecular medicine, bio-x, computation science and high precision measurements, among others.

More than half of its permanent academic staff are recognized by the Chinese government as the best talents of their age group. Fifteen are members of CAS, a prestigious title awarded to only a select group of China's top scientific minds. Among them is Jian-Wei Pan (see 'Making light work of quantum breakthroughs'), who is working with younger quantum whiz, Chao-Yang Lu.

Emerging talent makes up the majority of the laboratory's cohort, explains Luo. "It's impossible to replicate the kind of inspiration our people, facilities and research results bring to younger generations," he says. Luo envisions that HFNL's innovative culture will inspire paradigm-shifting research for decades to come. ■