



MANOHAR PARRIKAR INSTITUTE FOR
DEFENCE STUDIES AND ANALYSES

मनोहर पर्रिकर रक्षा अध्ययन एवं विश्लेषण संस्थान

CHINA

SCIENCE AND TECHNOLOGY REVIEW

August 2024

- **Renowned Chinese Scientists Deceased**
- **Scientific Collaboration Projects**
- **Scientific Research Breakthroughs and Discoveries**
- **China Science Diplomacy**

Renowned Chinese Scientists Deceased

[Zhou Guangzhao](#), former President of the Chinese Academy of Sciences, who played a pivotal role in the Chinese nuclear weapons program has died at the age of 95. In 1999, Zhou was honored with the “Two Bombs, One Satellite”, a meritorious service medal awarded to outstanding scientists who contributed to the development of China’s atomic bombs, missiles and satellites.

Also, Nobel laureate in physics [Tsung-Dao Lee](#) passed away at the age of 97. Lee made groundbreaking contributions in particle physics, nuclear theory and statistical mechanics, where he along with Chen-Ning Yang discovered a violation of the “parity law” and earned the Nobel Prize in physics in 1957, the second youngest scientist ever to receive the prize. Lee was one of the pioneers in the establishment of the National Natural Science Foundation of China, which has now become a leader in the advancement of fundamental science in China. He played a leading role in initiating high-energy physics collaboration between China and the United States.

Scientific Collaboration Projects

A collaboration project addressing [ecological crises of the Aral Sea](#) was inaugurated on 23 August in Tashkent, Uzbekistan. The stakeholders are: the Xinjiang Institute of Ecology and Geography of the Chinese Academy of

Sciences, the Academy of Sciences of the Republic of Uzbekistan and the Ministry of Ecology, Environment Protection and Climate Change of Uzbekistan. The objective of the project is to restore the regional ecosystem and alleviate the effects of the Aral Sea drying up, where research will mainly focus on the changes of soil conditions and regional biodiversity. [Uzbek Minister of Ecology, Dr. Aziz Abdukhakimov](#), expressed confidence that “joint efforts and scientific cooperation will yield significant results and create the basis for implementing new environmental projects and initiatives in the region in the future.”

The [Aral Sea](#) was once the fourth largest freshwater lake in the world, shared by Kazakhstan and Uzbekistan, but has lost about 90% of its size since the 1960s, mainly due to unsustainable cotton cultivation during the Soviet period. Over the years, several projects funded by the World Bank and UNEP were initiated to restore the lake.

Scientific Research Breakthroughs and Discoveries

A team led by [Cui Guanglei from the Qingdao Institute of Bioenergy and Bioprocess Technology](#) (QIBEBT) of the Chinese Academy of Sciences has developed a new cathode material which increases the life cycle of all solid-state lithium batteries, maintaining 80 per cent of initial capacity even after 5000 charge and discharge cycles. With an energy density of

up to 390 watt-hours per kilogram, the new battery has a longer life compared to most advanced lithium-ion batteries that are available in the market. According to the research team, the parent material was identified in an article published by Nobel laureate John Bannister Goodenough in 2008 and they were able to demonstrate excellent ionic conductivity. This new invention will aid China's "dual carbon" strategic goal in promoting green and low-carbon transformation of the Chinese economy.

Meanwhile, researchers from the [Dalian Institute of Chemical Physics and Xi'an Jiaotong University](#) have developed a new type of deep learning to predict the lifetime of lithium-ion batteries. According to the research report, it can accurately predict the battery current cycle life as well as the remaining service life by using data from only 15 charge cycles.

A collaboration between Lanzhou University, Institute of Modern Physics of the Chinese Academy of Sciences and the Relativistic Heavy Ion Collider (RHIC), a U.S. Department of Energy Office of Science user facility for nuclear physics research at Brookhaven National Laboratory, [discovered a new kind of anti-matter](#), the heaviest yet discovered by using this house-sized particle detector. The anti-matter called anti-hyperhydrogen-4 is made up of an anti-proton, two anti-neutrons and one anti-hyperon.

[The Institute of High Energy Physics \(IHEP\)](#) of the Chinese Academy of Sciences has announced that major progress has been made in the construction of the High Energy Photon Source (HEPS), in Beijing's suburban Huairou district, the first high-energy synchrotron radiation light source in China. HEPS is an ultra-low emittance ring-based synchrotron radiation light source with a beam energy of 6 GeV. Commenced in June 2019, once the construction of HEPS is completed, China will join the elite group of countries with high energy synchrotron radiation light sources which has revolutionized innovation in several industries, such as in the fields of aerospace, energy, environment and pharmaceuticals.

China Science Diplomacy

The [Fifth Meeting of the Science and Technology Cooperation Subcommittee](#) of the China-Belarus Intergovernmental Cooperation Committee was held on 23 August in Minsk, Belarus. The meeting was co-chaired by Chinese Minister of Science and Technology, Yin Hejun and Chairman of the Belarus State Committee for Science and Technology, Sergei Shlychikov. In a joint communique, it agreed to hold 2 years of "scientific and technological innovation" from 2024 to 2025. Meanwhile, [a protocol was signed](#) on 20 approvals for joint scientific and technical projects for 2024-2026 in the field of ICT, biotechnology and medicine, mechanical engineering, and new materials.