



MANOHAR PARRIKAR INSTITUTE FOR
DEFENCE STUDIES AND ANALYSES

मनोहर पर्रिकर रक्षा अध्ययन एवं विश्लेषण संस्थान

CHINA

SCIENCE AND TECHNOLOGY REVIEW

November 2024

- **China Releases Report on Scientific Research in 2024**
- **China Launches 'Open Science' Cooperation**
- **Scientific Collaboration Projects**
- **Scientific Research Breakthroughs and Discoveries**
- **China Science Diplomacy**

China Releases Report on Scientific Research in 2024

In collaboration with the Institutes of Science and Development of China Academy of Sciences (CASISD), the National Science Library of Chinese Academy of Sciences and Clarivate Analytics, two reports, “2024 Research Fronts” and “Research Fronts: Active Fields, Leading Countries/Regions”, were [released](#) on 27 November in Beijing. The reports are essentially about the ongoing progress of scientific research that has been carried out within China.

The reports have [identified](#) 125 research fronts, which includes 110 hot and 15 emerging fronts in 11 broad research areas i.e. in agricultural sciences, botany and zoology, ecology and environmental sciences, geosciences, clinical medicines, biological sciences, chemistry and materials sciences, physics, astronomy and astrophysics, mathematics, information science, economics and psychology. Meanwhile, the report also [reveals](#) the US continues to be ranked first in more than 50% of research fronts, China is ranked second in over 30%, followed by the UK, Germany and France.

With the backdrop of the latest report, the President of CASISD, Pan Jiaofeng, [commented](#) that research on AI, future energy and addressing climate change and human health continue to dominate research within China. Also, Vice President of CAS, Wu Zhaohui, [emphasised](#) that CAS will continue to “prioritize fundamental research” where over the years China “has attained a substantial number of original findings,

propelling several disciplines in China to the vanguard of global advancement.”

China Launches ‘Open Science’ Cooperation

The Chinese Ministry of Science and Technology [launched](#) an international cooperation on ‘open science’ on 21 November with Brazil, South Africa and the African Union. According to the Chinese Ministry of Science and Technology, the goal of the cooperation is to build an open, fair, impartial and non-discriminatory global environment for science and technology development.

The member states [agreed](#) to promote the implementation of the UNESCO Open Science recommendation based on the principle of mutual benefits and win-win cooperation, increase cooperation for technology transfer with developing countries and aid the global south in technological capacity building, as well as creating a platform where scientific knowledge is publicly available.

Scientific Collaboration Projects

China and Italy [launched](#) a Joint laboratory of Pharmaceutical Biotechnology and Immunosafety in Shenzhen, Guangdong Province. The collaborative lab was established by the Shenzhen Institute of Advanced Technology (SIAT) of the Chinese Academy of Sciences and the Italian Institute of Biochemistry and Cell Biology and the Institute of Translational Pharmacology. According to the laboratory director, Li Yang, the primary objective of the joint laboratory is to conduct research on the

immunotoxicity of natural and artificial substances, to develop immunomodulatory drugs and to study disease prevention and immunotherapy.

At an annual workshop from 6-8 November in Kunming city of Yunnan Province, under the auspices of Climate Science for Service Partnership China (CSSP China), scientists from the UK and China [made](#) an urgent commitment to strengthen Chinese and British collaboration to address climate change. During the workshop, both sides exchanged views on the development of climate prediction models and the application of machine learning in climate change as well as joint collaboration [projects](#) such as on tea plantations which are likely to be severely affected by climate change. Over 130 scientists from China and the UK attended the workshop, where Rowan Sutton, Director of the UK Met Office Hadley Centre for Climate Change and Services and Chao Qingchen, Director of the National Climate Centre of China Meteorological Administration, led the UK and Chinese teams respectively.

CSSP China was [launched](#) in 2014 to stimulate scientific collaboration between research institutes in the UK and China to produce world-leading scientific research, particularly to the development of climate services that support climate-resilient economic development and social welfare.

Scientific Research Breakthroughs and Discoveries

A research team from the University of Science and Technology of China (USTC)

in Hefei successfully [developed](#) a robotic chemist named ‘Luke’ which can perform several critical tasks in the laboratory, including pouring liquids and grinding solids, as well as independently designing experiments and testing hypotheses. According to Zhao Luyuan, a member of the research team, Luke, unlike humans, can perform several critical tasks without rest and with a precision of 0.1 millimeters in its operations. Also, Prof. Jiang Jun of USTC [stated](#) that due to the optimized solutions offered by robots, it has now become an ‘effective tool’ for scientists, especially following a significant milestone where they have developed an AI robotic chemist capable of producing oxygen from Martian meteorites, which will help enable a long-term human stay on Mars. Several institutions from Switzerland, UK and U.S have shown keen interest for collaboration with USTC.

In a joint research project between Nanjing University and USTC, they [pioneered](#) a global first by completing a quantum key distribution (QKD) experiment based on a drone platform. In the experiment, they demonstrated the capability to directly transmit single photons to end-users.

China Science Diplomacy

The 7th China-Sweden Joint Committee on Science and Technology Cooperation meeting was [held](#) in Beijing, where Dai Gang, Director of the International Cooperation Department of China’s Ministry of S&T and David Edvardsson, Director of the Research Policy Department of the Swedish Ministry of Education and Research

co-chaired the meeting. At the meeting, both sides agreed to collaborative research in green development and carbon neutrality, life sciences, global health and transfer of technologies.

Under the theme “Innovation Promotes Cooperation, and Cooperation Writes a New Chapter”, the Chinese Ministry of Science and Technology [organised](#) “2024 China-Africa Innovation Cooperation and Development Forum” from 6-8 November in Wuhan, Hubei Province. Around 800 delegates participated in the three-day forum. The objective of the forum was to explore new opportunities and future directions for China-Africa cooperation in scientific and technological innovation. In his remarks Qiu Yong, Vice Minister of Science and Technology, [emphasised](#) strengthening the top-level design innovation cooperation between China and African communities, expansion of exchanges through multiple channels and creation of platforms conducive to the promotion of S&T and industrial innovation.

The 16th China-EU Science and Technology Cooperation Steering Committee meeting was [held](#) on 27 November in Brussels. Dai Gang, Director General of the International Cooperation Department, Chinese Ministry of Science and Technology and Signe Ratz, Deputy Director-General of the Directorate General for Research, European Commission co-chaired the meeting. In the meeting, both sides reviewed the progress of several flagship projects initiated over the years and also sketched out future projects.