

Translation

The following article summarizes China's 2022 Nationwide S&T Work Conference, which reviewed China's progress toward its technological goals during 2021 and set new priorities for 2022. The conference also served to indoctrinate members of the PRC S&T bureaucracy in Xi Jinping's latest political pronouncements.

Title

2022 Nationwide S&T Work Conference Convened in Beijing
2022年全国科技工作会议在京召开

Source

PRC Ministry of Science and Technology (MOST; 科学技术部; 科技部) website, January 6, 2022.

The Chinese source text is available online at:

http://most.gov.cn/kjbgz/202201/t20220106_178939.html

An archived version of the Chinese source text is available online at: <https://perma.cc/U4RM-SWJ7>

U.S. \$1 ≈ 6.4 Chinese Yuan Renminbi (RMB), as of January 24, 2022.

Translation Date

January 24, 2022

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The 2022 National Science and Technology Work Conference was held in Beijing on January 6, via video link. The conference called for persisting in taking Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era as the guide, and fully implementing the spirit of the 19th Party Congress and all the plenums of the 19th Central Committee, as well as the spirit of the Central Economic Work Conference, and it summarized the science and technology (S&T) work of 2021 and laid out the key tasks for 2022. Wang Zhigang, Minister of Science and Technology and Secretary of the Party Group of the Ministry of Science and Technology (MOST), delivered the work report, and Zhang Yudong, Vice Minister of Science and Technology, chaired the conference.

The conference noted that 2021 was the 100th anniversary of the founding of the Chinese Communist Party (CCP), and in all the historical periods of revolution, construction, and reform, the CCP has always attached great importance to S&T undertakings. S&T innovation has always held a very important strategic position, and played a very important strategic role, in the causes of the Party and the people. Since the 18th Party Congress, socialism with Chinese characteristics has entered a new era. The CCP Central Committee, with Comrade Xi Jinping as the core, has carried out strategic and overall planning for China's S&T undertakings, and issued a call for us to join the ranks of the world's S&T powerhouses.¹ Our S&T undertakings have achieved

¹ Translator's note: This translation renders the Chinese word 强国 qiángguó—which literally means "strong nation"—in English as "powerhouse," as in the phrase "S&T powerhouse" (科技强国). For a more

a major historic, comprehensive, and structural transformation. Our S&T strength has leaped to a new level, and we have smoothly entered the ranks of innovation-oriented countries (创新型国家).

The conference also noted that 2021 was the inaugural year of the 14th Five-Year Plan, wherein the national S&T sector firmly put into practice the spirit of General Secretary Xi Jinping's important instructions and observations, as well as the major decisions and deployments of the Party Central Committee and the State Council, and promoted the solid implementation of tasks. S&T innovation played an important role in epidemic prevention and control, promotion of high-quality development, building the new development pattern (新发展格局), and assuring national security, achieving a good start to the 14th Five-Year Plan. The nation's rank in overall innovation ability has risen to 12th place in the world. First, we systematically summarized the major achievements in building an innovation-oriented country, prepared plans for a new round of national medium and long-term S&T development, for the 14th Five-Year Plan for National Science and Technology Innovation (“十四五”国家科技创新规划), and for various special plans, and basically formed a strategic planning layout for S&T innovation, taking into account the near, medium, and long term. The national advisory system for major S&T decisions has operated effectively and has played an important role in decision-making. Second, growth in strategic S&T strength has accelerated, and the national innovation system has been further refined. Construction of the national laboratory system was accelerated, and the restructuring of the state key laboratory system program was prepared and completed. Innovation-based development of higher educational and research institutions was accelerated. The innovation ability of enterprises was further strengthened, leading enterprises were supported in forming innovation consortia for key directions, the number of high-tech enterprises increased by 18.7% year-on-year, and their investment in R&D accounted for 70% of that of enterprises nationwide. Third, deployments for R&D focusing on the "four be oriented towards"² were strengthened, and new progress was made in basic research and tackling key and core technologies (关键核心技术). A ten-year plan for basic research (基础研究十年规划) was formulated. Over 70 key projects under the [National] Key Research and Development Plan have been fully launched and implemented. Implementation of new generation artificial intelligence (AI), quantum, and brain science-related S&T Innovation 2030 – Major Projects (科技创新2030重大项目) was accelerated. Original achievements were made in basic and cutting-edge fields: The two core conjectures of Kähler geometry were successfully proved, the world's first artificial starch synthesis in a laboratory was achieved, and the Zuchongzhi 2 and Jiuzhang-2 computers achieved quantum supremacy in two physical systems—superconducting quantum-based and optical quantum-based computing. New advances were made in strategic high technology. Tianwen-1 was launched on its

thorough discussion in English of the Chinese word qiángguó, see:

<https://www.newamerica.org/cybersecurity-initiative/digichina/blog/lexicon-wangluo-qiangguo/>

² Translator's note: The "four be oriented towards" (“四个面向”) are Xi Jinping's ideas about the purposes of China's S&T development. They are: Persist in (1) being oriented toward the cutting edge of world S&T, (2) being oriented toward the main battleground, namely the economy, (3) being oriented toward the major needs of the nation, and (4) being oriented toward the lives and health of the people.

way to Mars, Xihe (Chinese H-Alpha Solar Explorer) made a breakthrough achievement as a Chinese first in solar exploration, Shenzhou 13 successfully docked with the Tianhe core module, the Haidou-1 submersible broke many world records, and a high-temperature gas-cooled reactor nuclear power demonstration project was connected to the grid for the first time. Fourth, the deep integration of S&T with the economy and society was vigorously promoted, supporting, and leading the achievement of new accomplishments in high-quality development. S&T innovation led the innovative development of modern industries, with breakthroughs in 5G full-scene (全场景) applications and R&D on complete units (整机); integration of the innovation and production chains of new energy vehicles and new displays developed, while development in the AI industry accelerated; the 600-km per hour high-speed magnetic levitation (maglev) prototype was successfully launched, and the "Jinghua"—the largest-diameter domestically produced tunnel boring machine—was commissioned. S&T consolidated and expanded the results of poverty eradication and helped promote rural revitalization. S&T support focusing on land and the seed industry was strengthened, a number of new varieties of rice, corn, soybeans, and other crops were demonstrated and extended, and the contribution rate of new crop varieties to increasing yield exceeded 45%. S&T strongly supported the improvement of the people's livelihoods, action plans for S&T support of a carbon emission peak and carbon neutrality and a carbon neutral technology development roadmap were prepared, and application and promotion of technologies for joint prevention and control of air pollution, clean and efficient use of coal, etc., were accelerated. New progress was made in anti-epidemic S&T. Fourteen vaccines were approved for phase III clinical trials, and seven vaccines were approved for use, two of which were included in the global emergency use list. The first effective neutralizing antibody drug was approved for the market, and 65 testing reagent products came on the market. Results from the "Science and Technology Winter Olympics" were fully applied in test competitions. Fifth, the leading role of innovation hubs continued to be enhanced, with Beijing, Shanghai, and the Guangdong-Hong Kong-Macau Greater Bay Area ranked among the top ten global S&T clusters, and cooperation between the eastern and western regions in S&T promoted the innovation-driven development of Guizhou, Guangxi, Gansu, and other places. The national innovation zones and high-tech zones accelerated their high-quality development, and several measures for a new round of pilot reforms were introduced for Zhongguancun [technology hub]. The number of enterprises included in the national database of S&T-based small and medium-size enterprises reached 328,000. There were more than 14,000 makerspaces, incubators, and other business incubation facilitators, covering 95% of areas above the county level, and nearly five million people were employed by entrepreneurship. Sixth, reform and talent team construction in key areas deepened, and further improvements were made in work and study styles and the innovation ecosystem. Major reform tasks were implemented steadily, the Three-Year Problem-Tackling Plan for Science and Technology Structural Reform (科技体制改革三年攻坚方案) was released, and revision of the Law on Progress in Science and Technology was completed. New breakthroughs were made in the reform of scientific research project funding management. New

mechanisms were explored, including "winner-takes-all open competition,"³ "horse race," "chief scientist responsibility system," and "Young Scientist Project," and funding management reform was promoted in such aspects as budget transfer authority and indirect cost ratios. We issued guiding opinions on the reform of S&T achievement evaluation, and reform pilot projects were promoted, with 40 work units having carried out pilot projects to give scientific researchers ownership or long-term use of scientific research achievements. The "100 Cities and 100 Parks" ("百城百园") initiative converted and extended 2,800 technological achievements. The S&T talent evaluation reform pilot program was deepened, and young S&T talent team construction was strengthened. The Outline of the National Scientific Literacy Action Plan⁴ was released, and breakthroughs were made in preferential tax policies such as those on recognition of science popularization bases and the scope of imported science popularization supplies. Work style and learning style construction was further strengthened, the construction of a "big supervision" (大监督) pattern for S&T was accelerated, guidelines to strengthen governance of S&T ethics were formulated, a multi-departmental joint working mechanism was established, and major scientific research integrity cases were sternly investigated and handled. Seventh, S&T cooperation and exchanges were steadily promoted, opening up new space for the expansion of innovation. Government-to-government S&T cooperation was carried out. A high-quality China-Russia Year of Science and Technology Innovation was held, Sino-U.S. and Sino-European exchanges were promoted in fields such as anti-epidemic scientific research, and new progress was made in promoting S&T cooperation with ASEAN, Latin American, and Central and Eastern European countries. "Belt and Road Initiative"⁵ S&T cooperation was further promoted, the scientific community was supported in leading the launch of relevant international scientific programs, and China officially became a member of the Square Kilometer Array observatory. The participation of universities and research institutions in Hong Kong and Macau in national key research and development projects was promoted.

The conference stressed that the S&T policies proposed by the Central Economic Work Conference must be solidly implemented, and further highlighted the important position of S&T innovation in the construction of a modernized economic system. It also clarified the focus of this year's S&T work. We must: Adhere to systematic concepts (系统观念), and grasp the relationship between key breakthroughs and comprehensive deployments, and the relationship between near-term work and long-term planning; give greater prominence to fulfillment of major R&D tasks, win the battles to tackle key

³ Translator's note: The idea behind "winner-takes-all open competition" (揭榜挂帅), in the context of PRC science and technology projects, is that the government openly lists the technological breakthrough(s) it desires. Any individual or group in society, not just a select few, are then eligible to win a cash award if they succeed in making the breakthrough. This concept is also known as the "bounty system" (悬赏制).

⁴ Translator's note: For an English translation of the Nationwide Scientific Literacy Action Plan, see: <https://cset.georgetown.edu/publication/state-council-notice-on-the-publication-of-the-outline-of-the-nationwide-scientific-literacy-action-plan-2021-2035/>

⁵ Translator's note: The "Belt and Road Initiative" ("一带一路") refers to the Silk Road Economic Belt (丝绸之路经济带) and the 21st Century Maritime Silk Road (21世纪海上丝绸之路).

and core technology problems, and accelerate implementation of S&T Innovation 2030 – Major Projects; give more prominence to strengthening national strategic S&T power, promote getting national laboratories fully on track and operational, and complete the phased tasks for state key laboratory reorganization; give more prominence to the mainstay status of enterprises in innovation, incubate and grow leading S&T enterprises, high-tech enterprises, and S&T-based small and medium-size enterprises; give more prominence to tackling the hard issues in reform, implement the Three-Year Problem-Tackling Plan for Science and Technology Structural Reform, focus on promoting the effective implementation of reform measures such as those on the new structure for leveraging national capabilities (新型举国体制), as well as evaluation, project funding management, etc.; give greater prominence to stimulating the innovative vitality of talents, promote the training and use of strategic scientists, cultivation of young S&T talents, and building of high-level innovation teams; give more prominence to open (开放) innovation, and propose new initiatives in areas such as international big science plans and projects, and ethical governance. We must: Focus on detailed and quantified indicators for the decisions and deployments of the CCP Central Committee and the State Council, develop roadmaps and timetables, and allocate resources and assess effectiveness while being centered on objectives; research and propose operational projects, undertakings, special actions, and pragmatic and practical policy initiatives; accelerate the transformation of government functions (转变政府职能), carry out in-depth survey research, and effectively provide precision services for researchers and innovation entities, generate more major original achievements with international impact, and see more results in terms of increasing the security and resilience of the production chain and supply chain, in terms of responding to the "triple pressures" of demand contraction, supply shocks, and weakening expectations, and in terms of enhancing the people's sense of gain and wellbeing.

The conference pointed out that S&T work in 2022 should be guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, fully implement the spirit of the 19th Party Congress and all the plenums of the 19th Central Committee, implement the deployments of the Central Economic Work Conference, adhere to the "four be oriented towards," and implement the requirements of the "four grasps" (“四抓”); take hastening the realization of high-level S&T self-sustainability and self-improvement as the goal, take grasping the solid implementation of S&T policies as the theme, and take the Three-Year Problem-Tackling Plan for Science and Technology Structural Reform as the main line; accelerate the transformation of government functions, the transformation of work style, and the deepening of reform, and do a good job of coordination; focus on (1) strengthening national S&T power, (2) strengthening basic research, (3) winning the battles to tackle key and core technology problems, (4) strengthening the mainstay status of enterprises in innovation, (5) strengthening the construction of S&T talent teams, (6) optimizing the S&T innovation ecosystem, and (7) expanding open cooperation; improve the overall effectiveness of S&T innovation, and give full play to the strategic role of S&T in supporting the nation's development and security, thereby using excellent results to pave the way for holding a successful 20th Party Congress. Focus on grasping ten aspects of work: The first is to comprehensively promote the implementation of S&T planning tasks, making better

use of the strategic guidance role. The second is to implement a ten-year plan for basic research, grasping the tackling of vital problems of key and core technologies. The third is to promote the effective operation of the national laboratory system, fully utilizing its role in leading strategic S&T power. The fourth is to strengthen the mainstay status of enterprises in innovation, promoting the aggregation of innovation resources around enterprises. The fifth is to accelerate S&T breakthroughs and application of achievements, supporting and leading stable growth and improving the people's livelihoods. The sixth is to implement actions for S&T to support carbon emission peak and carbon neutrality, accelerating promotion of green and low-carbon transformation. The seventh is to carry out high-level construction of international and regional S&T innovation centers, creating a number of innovation policy sources and growth poles. The eighth is to implement the Three-Year Problem-Tackling Plan for Science and Technology Structural Reform, optimizing the S&T innovation ecosystem. The ninth is to focus on strategic talent power, stepping up the use of talent training and recruitment. The tenth is to expand S&T cooperation and openness, and actively participate in global S&T governance.

The meeting stressed the need to fully and rigorously implement our principal responsibility to comprehensively run the Party strictly (全面从严治党), accelerate political institution construction, adhere to and strengthen the Party's overall leadership of S&T work, consolidate and expand the results of Party history study and education, and push Party members and cadres in the S&T system to more profoundly understand the decisive significance of the "two establishes,"⁶ further reinforce the "four consciousnesses,"⁷ be steadfast on the "four confidences,"⁸ achieve the "two upholds,"⁹ and constantly improve their abilities in terms of political judgment, political comprehension, and political execution, so as to provide strong political assurance for S&T reform and development.

Attendees at the main conference venue included: the responsible comrades of the 25th Central Steering Group for Party History Study and Education (党史学习教育中央第二十五指导组), the Chinese Academy of Sciences (CAS), the Chinese Academy of Engineering (CAE), the State Administration of Science, Technology and Industry for National Defense (SASTIND), and the China Association for Science and Technology (CAST); members of the MOST leadership team; relevant responsible comrades of the

⁶ Translator's note: The "two establishes" ("两个确立") are: (1) Establish Xi Jinping's status as the core of the CCP Central Committee and the core of the entire Party, and (2) establish the guiding status of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era.

⁷ Translator's note: The "four consciousnesses" ("四个意识") are: (1) political consciousness, (2) consciousness of the big picture, (3) consciousness of the core leadership, and (4) consciousness of falling in line with Party directives (政治意识、大局意识、核心意识、看齐意识).

⁸ Translator's note: The "four confidences" ("四个自信") are: Confidence in the (1) path, (2) theory, (3) system, and (4) culture of socialism with Chinese characteristics (中国特色社会主义道路自信、理论自信、制度自信、文化自信).

⁹ Translator's note: The "two upholds" ("两个维护") are: (1) Firmly uphold General Secretary Xi Jinping's status as the core of the CCP Central Committee and the core of the entire Party; and (2) firmly uphold the authority of and the centralized unified leadership of the CCP Central Committee (坚决维护习近平总书记党中央的核心、全党的核心地位, 坚决维护党中央权威和集中统一领导).

Central Propaganda Department, the Office of the Central Financial and Economic Affairs Commission, the Science and Technology Committee of the Central Military Commission (CMC), the Equipment Development Department of the CMC, the Education, Science, Culture, and Public Health Committee of the National People's Congress (NPC), the Education, Science, Health, and Sports Committee of the Chinese People's Political Consultative Conference (CPPCC), the General Office of the State Council, the State Council Research Office, the National Administration of State Secrets Protection, the National Development and Reform Commission (NDRC), the Ministry of Education, MOST, the Ministry of Industry and Information Technology (MIIT), the Ministry of Finance, the Ministry of Agriculture and Rural Affairs, the National Health Commission, and the State-Owned Assets Supervision and Administration Commission (SASAC); responsible comrades of the discipline inspection groups of the Central Commission for Discipline Inspection (CCDI) and the National Supervisory Commission stationed at MOST, the Science and Technology Audit Office of the National Audit Office; the main responsible Party and government comrades of all of MOST's departments, divisions, bureaus, Party committees for institutions directly subordinate to MOST, and various directly subordinate public institutions,¹⁰ and relevant responsible comrades of the National Natural Science Foundation of China and *Science and Technology Daily*. Attending the conference via video session were the members of the leadership teams of S&T departments (committees, bureaus), and the responsible comrades of relevant departments, of all provinces, autonomous regions, and province-level municipalities under the Central Government, cities with independent planning status under the national economic and social development plan, sub-provincial cities, and the Xinjiang Production and Construction Corps; the main responsible comrades of national high-tech zones, independent innovation demonstration zones, sustainable development experimental zones, agricultural high-tech industry demonstration zones, and national laboratories; and all cadres and employees in the MOST system.

¹⁰ Translator's note: "Public institutions" (事业单位) are organizations created and led by PRC government departments that provide social services. Unlike state-owned enterprises (SOEs), public institutions do not create material products and do not generate income. Public institutions are not considered government agencies, and their employees are not civil servants. Most public institutions are fully or partially government-funded, but some fully privately funded (but still government-led) public institutions exist. Public institutions typically provide services in areas such as education, science and technology, culture, health, and sanitation.