

Translation



The following is the text of a speech that Chinese President Xi Jinping delivered to a symposium of scientists on September 11, 2020, which he had convened to solicit input for China's upcoming 14th Five-Year Plan. Xi stresses the need for China to improve its economic and scientific self-sufficiency. To that end, he urges increased investment in basic research, and advocates both improved academic training for scientists at PRC universities and continued efforts to recruit foreign scientists to work in China.

Title

(Authorized Release) Xi Jinping: Speech at the Symposium of Scientists
(授权发布) 习近平：在科学家座谈会上的讲话

Author

Xi Jinping (习近平)

Source

Xinhua News Agency (新华社), September 11, 2020. Xinhua is China's state press agency.

The Chinese source text is available online here:

https://web.archive.org/web/20200915164319/http://www.xinhuanet.com/politics/2020-09/11/c_1126483997.htm

Independently of CSET, the Stanford University-New America DigiChina Project also translated this speech into English. DigiChina's translation is available at:

<https://www.newamerica.org/cybersecurity-initiative/digichina/blog/translation-xi-jinpings-sept-2020-speech-science-and-technology/>

DigiChina also provided analytical commentary from several China specialists that contextualizes the speech and flags noteworthy passages in it. The commentary is available online at:

<https://www.newamerica.org/cybersecurity-initiative/digichina/blog/experts-xis-science-and-technology-speech-echoes-and-updates-deng-xiaoping/>

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Editor

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We convene the scientists' symposium today in order to hear everyone's opinions and suggestions on promoting innovation-driven development and accelerating science and technology (S&T) innovation during the "14th Five-Year Plan" and for an even longer period of time. The scientists and S&T workers attending today's symposium come from scientific research institutes, institutions of higher learning, and enterprises. They are engaged in basic research, applied basic research, and applied research. There are also foreign scientists working in China.

A short while ago, you presented many valuable opinions and suggestions from the perspectives of your own fields of research about such matters as deepening S&T institutional reforms and promoting S&T innovation and development. I ask that the parties concerned conscientiously research and assimilate your ideas. Now, in light of your statements, I will express a few opinions of my own.

I. Fully Recognizing the Major Strategic Significance of Accelerating S&T Innovation

Since the 18th Party Congress, we have been taking S&T innovation work quite seriously and have insisted on making innovation the primary driving force (第一动力) that spurs development. Thanks to the combined efforts of our entire society, S&T in China has achieved historic success and has undergone a historic transformation. Major innovative achievements have emerged through competition. In some cutting-edge fields, China is beginning to achieve parity with other countries or to take the lead. Our S&T strength is now moving away from merely racking up the numbers towards rapid improvements in quality, and from isolated breakthroughs towards enhanced systemic capabilities. In the fight against the COVID-19 epidemic, many S&T workers tackled key scientific research problems in important fields such as treatment, vaccine development, and prevention and control. They provided powerful support and major contributions toward the overall plan to push forward with epidemic prevention and control and economic and social development. I take this opportunity to express my heartfelt thanks to these many S&T workers!

As the world undergoes major disruptions of a sort not seen in a century, China's development is challenged by domestic and foreign environments that are experiencing profoundly complex changes. China's development urgently requires an acceleration of S&T innovation in the 14th Five-Year Plan and beyond. First, accelerating S&T innovation is necessary in order to propel high-quality development. The building of a modernized economic system and the promotion of a revolution in quality and efficiency requires powerful S&T support. Second, accelerating S&T innovation is necessary for realizing high quality of life for the people. The main contradiction in Chinese society has now become the contradiction between the people's ever-growing demands for a good life on the one hand and unbalanced and insufficient development on the other. To satisfy the people's yearnings for a good life, we will need to come up with a greater number of S&T innovation achievements that affect the people's livelihoods. Third, accelerating S&T innovation is necessary for establishing a new development pattern (新发展格局). To give impetus to domestic circulation (大循环), we must insist on supply-side structural reform as the main thread and raise the quality and level of the supply system, using new supply to create new demand. S&T innovation is critical to all of this. The power of S&T will also be needed to open up domestic-international dual circulation (双循环) and to protect the security and stability of the production chain and supply chain. Fourth, accelerating S&T innovation is needed in order to smoothly launch the new journey of comprehensively building a modernized socialist country. S&T modernization has always been an important part of how China achieves modernization, from the time that the "four

modernizations”¹ were first put forward to the present call to comprehensively build China into a modernized socialist superpower (社会主义现代化强国).

The need for S&T solutions is greater now than at any previous time if we are to develop China’s economy and society and improve the people’s livelihoods. Both set higher demands on strengthening innovation as the primary driving force. At same time, faced with intense international competition and rising unilateralism and protectionism, we must travel an innovation path suited to our national conditions. In particular, we must give even greater prominence to improving original innovation (原始创新) capabilities and strive to achieve even more “zero to one” breakthroughs. I hope that the many scientists and S&T workers will shoulder their historical responsibilities and, with their focus on the cutting edge of global S&T, the main battlefield of the economy, the major needs of our country, and the lives and health of our people, they will continually expand and deepen S&T.

II. Speeding Up the Solutions to Some Key Problems Holding Back the Development of S&T Innovation

China has a great number of S&T workers and has dedicated enormous resources to research and development. In some fields, we are becoming competitive at an advanced international level. The key lies in improving the S&T innovation ecosystem, stimulating creativity, and building a stage on which numerous scientists and S&T workers can exhibit their talents so that S&T innovation achievements may keep arising in an endless stream.

One: Persist in focusing on demand and focusing on problems. The selection of scientific research topics is the first problem that must be solved in S&T work. I have said many times that we must insist on focusing research on demand and truly solve actual problems geared to the urgent and long-term needs of our country. Engels once said: “Once a society has a technical need, this need will be able to push science forward more than ten universities.”

There are currently many practical problems that need to be solved for the sake of developing China’s economy and society, improving the people’s livelihoods, and building up national defense. For example, in the agricultural sector, there are many seeds that we are heavily dependent on foreign countries for, and agricultural product cultivation and processing technology are relatively backward. Agricultural nonpoint source pollution and heavy metal farmland pollution are severe in some regions. As for industry, some critical, core technologies are under the control of others. We rely on imports for some critical devices, components, and raw materials. With respect to energy resources, we are dependent on imports for 70% of our petroleum. There is not enough gas exploration and development or enough development of new energy technologies. The spatial distribution of water resources is out of balance and causing many problems. With respect to society, the aging of China’s population continues to deepen, while the people’s demand for healthy lives continually rises. The problem of lagging S&T development in the biotech, pharmaceutical, and healthcare fields is becoming more

¹ Translator's note: The "four modernizations" (四个现代化) are: Industrial modernization, agricultural modernization, national defense modernization, and S&T modernization. This formulation dates to the early years of the People's Republic of China.

conspicuous by the day. We need to rush forward with technologies that can make rapid breakthroughs and promptly solve problems. As for strategic technologies that require a long time to succeed, these need to be deployed ahead of schedule.

Two: Consolidate and optimize S&T resource allocation. Optimization of S&T resources is critical to S&T innovation. The success of “two bombs and one satellite”² depended on a group of outstandingly talented persons and on China’s powerful organizational system. We have many scientists and academicians. In terms of numbers, our scientific researchers and engineers can rival any country in the world. Now we need to hurry up and build an innovation system, optimize and combine, and overcome the deficiencies of scattered resources, low efficiency, and redundancy. We need scientists with the ability to command and mobilize effectively consolidated scientific research resources. We need to bring the mainstay role of corporate technological innovation into play, promote concentration of key factors of production for innovation in enterprises, and spur a deep integration of industry, academia, and research. We must take advantage of the Chinese socialist system’s superior capability to concentrate resources to undertake big endeavors; let us optimize the allocation of resources that we have advantages in and push ahead in tackling critical, core technological problems in important fields. Let us build a group of national laboratories and reorganize existing national key laboratories to form a Chinese laboratory system. The important role of universities in scientific research needs to be fully realized. Let us unleash the enthusiasm of all kinds of scientific research institutes and form strategic forces by making the most of our advantages in talent pool size and organization.

Three, unrelentingly strengthen basic research. Basic research is the fountainhead of S&T innovation. Although significant progress has been made in China’s basic research, it is still obviously below the advanced international level. China is faced with many “stranglehold” technological problems. Their root lies in lagging basic theoretical research. We’ve failed to clarify things at the level of the source and foundation. In one respect, basic research, in conformance with scientific discovery’s own laws, requires curiosity to explore the world’s mysteries. There is thus a need to encourage free exploration and full exchanges and debates. In another respect, basic research is driven by major S&T problems. That is, abstract theoretical questions are formed in the course of researching major applications and then lead to explorations of scientific laws, with the result that basic research and applied research spur each other on. We need to clearly define the directions of China’s basic research fields and development objectives. Success will be the fruit of a long process; we must continue to persevere. We need to dedicate more resources to basic research. The state treasury must first intensify its investments while guiding enterprises and financial institutions to increase their support in appropriate ways. Society should be encouraged to invest through multiple channels such as by donating or establishing funds. This is a way to expand funding sources and form continuous and stable investment mechanisms. Scientific research units and enterprises that successfully engage in basic research should receive necessary policy support in aspects such as government fiscal budgets, financing, and taxation. We need to create a good scientific

² Translator’s note: “Two bombs and one satellite” (“两弹一星”) refers to China’s efforts to build its own atomic bomb, hydrogen bomb, and artificial satellite. China achieved these goals between 1964 and 1970.

research ecology that is beneficial to basic research, establish a sound scientific evaluation system and incentive mechanism to encourage the great number of scientific research personnel to emancipate their minds (解放思想) and boldly innovate, and thus let scientists devote themselves to their research. We need to set up first-rate academic periodicals and various kinds of academic platforms to strengthen domestic and international academic exchanges.

Four, strengthen education and training for innovative talents. Talent is the number-one resource. The root of a nation's ability to innovate in S&T lies in its people. It takes ten years to grow a tree, but a hundred years to grow people. Education needs to be taken even more seriously. There needs to be an overall improvement in the quality of education, with a focus on cultivating students' innovation consciousness and innovation capacity. We should strengthen such basic subjects as mathematics, physics, chemistry, and biology, encourage qualified institutions of higher learning to actively set up basic research and interdisciplinary-related disciplines and majors, strengthen undergraduate training in basic disciplines, and explore continuous training modes for basic disciplines at the undergraduate, master's, and doctoral levels. We need to strengthen training in basic disciplines for outstanding students and set up a number of bases in subjects such as math, physics, chemistry, and biology to attract the very best students so that they devote themselves to basic research. Let us strengthen basic research at institutions of higher learning, design and build cutting-edge science centers, and develop new types of research universities. We need to respect the ways in which talented people grow and the intrinsic patterns of scientific research activity and thus cultivate and train world-class strategic S&T talent, S&T leaders, and innovation teams. We must take the development of youth S&T talents very seriously so that they become the main force for S&T innovation. We need to draw first-rate talent from around the world, attract high-end talent from overseas, and provide internationally competitive and attractive work environments for overseas scientists.

Five, rely on reforms to stimulate S&T innovation activity. The ranks of China's S&T professionals contain enormous innovation potential. The key is to effectively unleash this potential by deepening S&T structural reform. An important task of the S&T reforms is the transformation of government functions. Many of our production chains and supply chains are in need of S&T solutions, and the only ones who can provide such solutions are the countless S&T workers and market entities fighting bravely on the front lines. What the government should do is create a good environment for them and provide them with the basic necessary conditions. It should properly perform its organizational and coordinating roles. We need to accelerate the transformation of S&T management functions and shift more energy from the tasks of dividing up money, dividing up resources, and designating projects to setting strategy, setting directives, setting policy, creating environments, and doing a good job of providing services. We should push forward with the reforms of scientific research institutes, grant greater autonomy to institutions of higher learning and scientific research organizations, grant greater authority to leading innovation talents to determine technology roadmaps and make use of funds, and resolutely eliminate [the overemphasis on] "papers, titles, degrees, and awards." We need to integrate the institutional systems which invest in government funds for

scientific research and put an end to the situation of small, scattered, and divided departments. We will comprehensively study and consider an issue that everyone brought up, the issue of strengthening overall planning of S&T efforts.

Six, strengthen international S&T cooperation. International S&T cooperation is an important trend. We must more actively integrate ourselves into global innovation networks and improve our own S&T innovation capabilities in the midst of open cooperation. As we are subject to increasing blockades and suppression, all the more so we cannot afford to wall ourselves off or self-isolate. Rather, we should pursue an international S&T cooperation strategy of greater openness and tolerance and shared benefits. On the one hand, we should insist on putting our own house in order and continue to improve our S&T independent innovation (自主创新) capabilities, create “longboards” (“长板”) in some fields where we have the advantage, and consolidate the foundation for international cooperation. On the other hand, we should employ more open ways of thinking and act to push forward with international S&T exchanges and cooperation. Under the present circumstances, we need to pragmatically push forward with international S&T cooperation in epidemic prevention and control and in public health, particularly research cooperation in the fields of drug, vaccine, and testing development. We need to focus on common problems such as climate change and human health and strengthen joint research and development with scientific research personnel from all countries. We should gradually open up China to the establishment of international S&T organizations, with foreign scientists filling positions in Chinese academic S&T organizations, so that China can become a vast stage for open, global S&T cooperation.

III. Vigorously Carrying Forward the Scientific Spirit

Scientific achievements cannot be separated from spiritual (精神) support. The scientific spirit is a precious spiritual treasure stored up over a long period of scientific practice by S&T workers. Since the founding of new China, a great number of S&T workers have erected one monument to S&T innovation after another on the territory of the motherland. They have also forged a unique ethos. In May of last year, the Chinese Communist Party (CCP) Central Committee specially issued the *Opinions on Further Promoting the Scientific Spirit and Strengthening Work and Study Styles*. It calls for a patriotic spirit of love for the motherland and service for the people, for an innovative spirit of scaling great heights and daring to be first, for a pragmatic spirit of seeking the truth and meticulous study, for a dedicated spirit of indifference to fame and wealth and devotion to research, for a cooperative spirit of bringing many minds together to tackle key problems and uniting in collaboration, and for a fostering spirit of making sacrifices so that others may succeed and of promoting future study. The great number of S&T workers need to shoulder the heavy burden of S&T innovation that history has placed upon them. I want to emphasize here the patriotic spirit and the spirit of innovation.

Science does not know national boundaries, but scientists have motherlands. China has made historic achievements in its S&T endeavors. They are the result of one generation after another of scientists dedicating themselves to the service of their country in a continuous struggle. From the many scientists of the older generation, such as Li Siguang, Qian Xuesen, Qian Sanqiang, and Deng Jiaxian to the many outstanding scientists such as Chen Jingrun,

Huang Danian, and Nan Rendong who grew up after the founding of new China, they are all models of patriotic scientists. I hope that the vast number of S&T workers remain true to their original intentions and keep the mission firmly in mind, that they put the good of the country and of the people first, that they inherit and carry forward the outstanding moral qualities of the older generation of scientists, namely their love of country and service for the people, that they promote the spirit of the “two bombs and one satellite,” that they actively shoulder their historical mission, and that they integrate their own scientific pursuits into the great cause of building a modernized socialist country.

S&T innovation, especially original innovation, requires creative thinking ability and strict evidence-based methods, a lack of superstitious respect for academic authority, a refusal to blindly follow existing theories, a willingness to ask bold questions and take concrete evidence seriously, and continual experimentation. Original innovation generally comes from hypotheses and suppositions. It is a complex process of observation, reflection, hypothesis making, experimentation, verification, and induction and is not simply a matter of induction. The creativity of hypotheses and suppositions is of paramount importance. Einstein once said: “The mere formulation of a problem is far more essential than its solution.” If one chooses incorrectly, it will be very difficult to achieve results, even if one expends a great deal of energy. The vast number of S&T workers should establish the noble ambitions of daring to create, of daring to put forward new theories, of pioneering new fields, of exploring new paths, and of putting more effort into being unique and original. They need to produce more high-quality original achievements and contribute to the continual enrichment and development of the scientific system. The scientist’s curiosity about the mysteries of nature is often the starting point for scientific research, especially for basic research. Practical experience shows that all scientists who have had breakthrough successes had them on the basis of a persistent curiosity and dedication. Lifelong exploration leads to a successful career. Studies have shown that scientists do not rely on just intelligence to succeed. Focus and diligence are even more important. They can achieve superiority in a field following a long period of exploration. We should encourage S&T workers to dedicate themselves to their own scientific research, to work hard and study intensively, and to do so without vanity and with no thought for their own fame or wealth. We need to widely publicize the vivid deeds of S&T workers who dare to explore and who dedicate their lives to science. Curiosity is natural to humans. Interest in science should be guided and cultivated in people from the time that they are children so that they can have a better grasp of scientific knowledge and master the scientific method. The result will be a large population of young people with the potential to become scientists.

Party committees, governments, and leading cadres at all levels must conscientiously implement the CCP Central Committee’s decisions and arrangements concerning S&T innovation. They must put into effect the innovation-driven development strategy, and, while respecting labor, respecting knowledge, respecting talent, and respecting the creative process, and conforming to the patterns of scientific development, give impetus to an unceasing emergence of S&T innovation achievements and to their transformation into real productive forces. Leading cadres need to strengthen their study of new scientific knowledge and pay attention to global S&T development trends.

Marx once said, "There is no royal road to science, and only those who do not dread the fatiguing climb of its steep paths have a chance of gaining its luminous summits." I believe that China's numerous scientists and S&T workers have the confidence, the will, and the ability to ascend the peaks of science, to realize the great rejuvenation of the Chinese nation, and to make their proper contribution to the building of a community of common human destiny!