

Translation



The following plan describes how the Chinese Academy of Sciences—a huge complex of state-run laboratories and research institutes—aims to encourage its scientists to adapt their discoveries for commercial or other practical use.

Title

Chinese Academy of Sciences Action and Implementation Plan for the Special Project on Transfer and Conversion of Scientific and Technological Achievements
中国科学院促进科技成果转移转化专项行动实施方案

Author

General Office (办公厅) of the Chinese Academy of Sciences (CAS; 中国科学院; 中科院). CAS is a huge PRC government-run complex of scientific research institutes.

Source

Website of the CAS Shanghai Institute of Microsystem and Information Technology (中国科学院上海微系统与信息技术研究所). The document is dated March 18, 2016 and was uploaded to the website on January 18, 2018.

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In order to further accelerate the transfer and conversion of scientific and technological (S&T) achievements into practical applications (科技成果转移转化), the Chinese Academy of Sciences (CAS) has decided to launch the "Special Project on Transfer and Conversion of Scientific and Technological Achievements" (hereinafter referred to as the "Special Project") under the framework of the "Take the Lead Initiative" plan,¹ based on the construction of a "S&T Service Network" and "Technology Innovation and Industrialization Alliance," and other preparatory work.

I. Overall Thinking

(1) Guiding Ideology

¹ Translator's note: The "Take the Lead Initiative" ("率先行动") is a Chinese Academy of Sciences (CAS) talent recruitment plan launched in 2014. Under the Initiative, CAS aims to "take the lead in carrying out leapfrog development of science and technology, take the lead in constructing a national bastion of innovative talent, take the lead in constructing a high-quality national S&T think tank, and take the lead in building a world-class scientific research institution" (率先实现科学技术跨越发展, 率先建成国家创新人才高地, 率先建成国家高水平科技智库, 率先建设国际一流科研机构) by 2030.

Following the directive of "the Three Set our Sights on and the Four Take the Leads"² for running CAS, we shall: Deeply implement the spirit of the Fifth Plenum of the 18th Chinese Communist Party (CCP) Central Committee; focus closely on the innovation-driven development strategy; actively respond to the call for "popular entrepreneurship and mass innovation" ("大众创业、万众创新") taking CAS's intellectual, technical, talent and S&T resources as the core; vigorously support and lead the transformation and upgrading of industries; place promoting the transfer and conversion of S&T achievements and serving the sustainable development of the national economy and society in a core position in CAS's overall development; and make our due contributions to China's entering the ranks of innovation-oriented countries and establishing a well-off society in an all-round way by 2020.

(2) Basic Principles

— **Guided leadership.** Focusing on major requirements, we shall establish a problem-oriented scientific research project establishment mechanism; focusing on major outputs, we shall establish contribution-oriented achievement evaluation mechanisms; and we shall lead our S&T workers in actively participating in the transfer and conversion of S&T achievements.

— **Open integration.** We shall: Further enhance CAS' cooperation with enterprises and local governments; promote the integration of knowledge innovation and technological innovation, and the integration of knowledge innovation and regional innovation; promote the close combination of CAS' S&T innovation resources with the production factors (生产要素) of society; and accelerate the formation of an integrated development system with effectively linked innovation chains, production chains and capital chains.

— **Support-related reform.** We shall: Deepen institutional and mechanism reform, and provide a good institutional and policy environment for promoting transfer and conversion of S&T achievements into practical applications; establish and improve the work system for overall coordination of "CAS leadership - CAS agencies - CAS branches - research institutes," and provide organizational support for promoting the transfer and conversion of S&T achievements into practical applications; integrate resources and increase investments, and provide funding support for promoting the transfer and conversion of S&T achievements into practical applications.

(3) Main objectives

Through implementation of the "Special Project," we will energetically explore institutional mechanisms for effectively promoting the transfer and conversion of S&T achievements into practical applications, significantly bolster CAS's S&T achievement transfer and conversion ability and significantly increase the efficiency of conversion, and see further growth and development of specialized talent teams engaged in related work.

² Translator's note: Translator's note: The "Three Set our Sights on and the Four Take the Leads" ("三个面向、四个率先") is the directive, established in 2015, of how CAS should be run. The "Three Set our Sights on" are: "Set our sights on the cutting edge of world S&T, set our sights on the major needs of the nation, and set our sights on the main battlefield that is the domestic economy" (面向世界科技前沿, 面向国家重大需求, 面向国民经济主战场). See footnote 1, above, for an explanation of the "Four Take the Leads."

Focusing around the "Belt and Road,"³ "Beijing-Tianjin-Hebei" integration, the "Yangtze River Economic Belt," the new round of "Northeast Revitalization," and other national strategic layouts, in conjunction with construction of internationally influential S&T innovation centers and comprehensive innovation and reform pilot zones in well-positioned regions such as Beijing and Shanghai, and other major initiatives, and accurately grasping the relevant S&T requirements for regional economic and social development, we will focus on promoting a number of major S&T achievement conversion applications that have good foundations, will show results quickly, and will be highly impactful. We will thereby make noticeable contributions to the structural optimization and upgrading of industries and their transformation and development.

Through implementation of the "Special Project," a significant increase will be achieved during the 13th Five-Year Plan period [2016-2020] in the economic and social benefits generated from CAS's transfer and conversion of S&T achievements into practical applications. By 2020, the transfer of S&T achievements of CAS will enable social enterprises (社会企业) to increase sales revenue by more than RMB 600 billion annually and profit tax by RMB 60 billion annually; CAS-invested enterprises will provide more than 150,000 jobs and their operating income will exceed RMB 600 billion per year, with annual profit tax of RMB 60 billion; CAS will incubate 5,000 "popular entrepreneurship and mass innovation" ("双创") enterprises and provide the "four technology services"⁴ for at least 20,000 enterprises; patent implementation will exceed 10,000 patents during the 13th Five-Year Plan period, quadrupling that of the 12th Five-Year Plan period [2011-2015].

II. Key Tasks

In order to mobilize S&T forces throughout CAS for comprehensively promoting S&T achievement transfer and conversion work, we shall strengthen the systematic design of project layout, from project establishment to acceptance, targeting the key problems and weak links constraining CAS's transfer and conversion of S&T achievements into practical applications. Focusing on the nation's major requirements and the main battleground of the domestic economy, we will rely on and constantly improve platforms for the transfer and conversion of S&T achievements into practical applications, and form a S&T achievement transfer and conversion network, which will function primarily to serve economic transformation and upgrading and the structural adjustment of industries, with the goal of supporting and leading the development and growth of emerging industries. At multiple levels, we shall cultivate teams of professionals interested in the transfer and conversion of S&T achievements into practical applications, and form a policy environment and cultural climate conducive to the transfer and transformation of S&T achievements and encouragement of innovation and entrepreneurship. We will truly make the promotion of economic and social development through science and technology the glorious mission of everyone throughout CAS.

³ Translator's note: The "Belt and Road" ("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).

⁴ Translator's note: The "four technology services" ("四技"服务) are: Technology development, technology ownership transfer (技术转让), technology consulting, and technology services. "Technology services" include technology training and technology intermediary services (技术中介).

(1) Promote a number of major S&T achievement outputs and implement their conversion into practical applications

1. Based on the existing deployment of Class-A Strategic Priority S&T projects, and in conjunction with construction of Innovation Academies, we will focus intently on "major outputs." During the 13th Five-Year Plan period, a number of major S&T achievements will be put into industrial production, or used for upgrading and retrofitting, to propel several major industries to achieve an output value of RMB 100 billion, focusing in particular on areas such as preparation of ultra-clean oil and high value-added chemicals from indirect coal liquefaction, technology for co-production of light olefins from toluene methylation to para-xylene, production of ethanol from methanol via dimethyl ether, "sea-cloud network" new media technology, robotics and smart manufacturing, stem cells and regenerative medicine, smart manufacturing of power batteries, the green circular economy, and advanced industrial bio-manufacturing. At the same time, we will newly deploy a number of R&D projects that have clear applications and are directed towards the main battleground of the domestic economy, and we will increase the proportion of the overall resource allocation going to support work of this kind. **([Action: CAS] Bureau of Major R&D Programs)**

2. Among already deployed Class-B Strategic Priority S&T projects, a number of S&T achievements with prospects for major applications will be promoted to achieve transfer and conversion during the 13th Five-Year Plan period. We will further enhance the forward-looking layout for industry-oriented applications in areas such as quantum communications, mapping of brain functional connections, comprehensive monitoring and forecasting of atmospheric pollution, energy-saving and emission reduction technologies, key S&T for shale gas development, "superconducting electronics," and "hadal trenches." We will focus on: Accelerating the promotion and application of quantum communication technology; establishing early diagnosis indicators for developmental brain diseases in early childhood, psychiatric diseases in early to middle adulthood, and neurodegenerative diseases in old age; breaking through the engineering technology bottlenecks in the practical application of equipment for the comprehensive 3D monitoring of atmospheric haze; forming an independent technology system for shale gas development; developing a series of superconducting sensors, detectors and system integration products; and achieving the localization of deep-sea materials and equipment. Among newly deployed R&D projects, we will strengthen interconnectedness between the business departments of agencies, and give support to the conversion and application of expected achievements. **(Bureau of Frontier Sciences and Education)**

3. We will continue to promote the "Science and Technology Service (STS) Network Program," strengthen the targeted positioning of STS projects supporting the transfer and conversion of S&T achievements and the promotion of their application, and establish smooth channels for research institutes and their scientific research staff to transform their labor, knowledge and technology into social wealth. During the 13th Five-Year Plan period, we will systematically organize and deploy a number of "problem-solving" projects in fields such as agricultural development, energy structure optimization, manufacturing industry transformation and upgrading, urban development, and ecological civilization construction. We will focus on: Carrying out customized R&D of advanced manufacturing technologies, processes and equipment; application and demonstration of the deep integration of information

technology and manufacturing industries; R&D and application of key basic materials and core basic parts (components); industrial energy saving, transportation energy saving, building energy saving, and other related technologies; and renewable energy and low-carbon environmental protection biotechnology in integrated industrial production applications, etc. Through "industry-university-research institution-user" collaborative innovation, we will accelerate promotion of practical technologies and boost the ability of relevant industries and industrial sectors to develop and apply technologies. **(Bureau of Science and Technology for Development)**

4. "Key Special Projects for the Transfer and Conversion of S&T Achievements" will be established to promote the output of major achievements. On the foundation of key technological breakthroughs achieved by CAS Strategic Priority S&T projects science and technology projects, the "one-three-five"⁵ of CAS research institutes, etc., we will further deepen reform during the 13th Five-Year Plan period, focus on objectives, emphasize the highlights, sort through achievements and select those that are expected to have a significant impact in 3-5 years, and organize implementation of around ten key projects on a pilot basis. Using this as the connection, we will establish a linkage mechanism for all business bureaus in their project deployment, and integrate forces across all of CAS for coordinated tackling of key challenges. Primarily through the "after-project subsidy" mode of support, we will guide relevant research institutes to form R&D consortia with Chinese Academy of Sciences Holdings enterprises and social enterprises, and focusing on the special requirements of industries or regions, use corporate funds, social capital⁶ and local governments for joint investment, and strengthen inter-institutional and interdisciplinary cooperation within the "consortia." The consortia will provide "tailor-made" system solutions that conform to the direction of transformation and upgrading-based development, and that have strong demonstration effects and large driving effects, and the enormous potential of CAS's S&T achievements to lead economic and social development will be released as much as possible. **(Bureau of Science and Technology for Development, Bureau of Major R&D Programs, Bureau of Frontier Sciences and Education, Bureau of Facility Support and Budget)**

5. Through close connection of CAS-invested enterprises and relevant industry departments, we will effectively promote "three-chain linkage" of the innovation chain, production chain and capital chain. During the 13th Five-Year Plan period, we will: Focus on laying out the upstream and downstream production chains for quantum communication, create industrial clusters for photonics industries with core independent IP, including optoelectronic integrated chips, optical communication, laser manufacturing, and biophotonics; promote development of China's ion medicine industry, push the establishment of public

⁵ Translator's note: "One-three-five" refers to the one R&D direction (一个研发定位), three major breakthroughs (三个重大突破), and five key lines of training (五个重点培育方向) that each institute of CAS should have every five years.

⁶ Translator's note: The Chinese term 社会资本, translated literally as "social capital," and its synonyms 社会资金 "social funding" and 社会投资 "social investment," refer to any source of funding outside of government budget outlays. These terms encompass investment by private individuals and private institutions. However, investment from state-funded entities such as state-owned enterprises (SOEs), including state-run banks, also falls under the umbrella of "social capital" or "social funding."

[nano] green plate platforms and internet-based printing platforms; develop high-value-added medical foods including low-protein rice; build a transpacific new gas industry chain for Chinese and U.S. gas converted to methanol; build circular economy industrial parks centered around waste incineration-based power generation, solid waste treatment, renewable energy, etc.; complete laying out the production chain for small satellite R&D, manufacturing and applications; and construct a "healthy hospitals" type of new industry format for modern biomedicine. We will actively lay out a bastion of emerging industry development. **(Chinese Academy of Sciences Holdings)**

(2) Establish a S&T achievement management system with intellectual property (IP) as its core

6. We will establish a "Chinese Academy of Sciences IP Operations Management Center," and enhance operations management of the IP of CAS-affiliated organizations. By effectively connecting the existing IP management of research institutes to IP management and operation organizations, we will collaborate with social organizations or CAS-run service organizations, using market-based methods, and build an IP services system comprising an "operations management center" plus certain "operations service platforms." We will: Conduct evaluations of the patentability and potential commercial value of S&T achievements, and where it is necessary to apply for patents, carry out whole-process quality management and value-added development; carry out analysis and targeted recommendations with regard to the application market and target customers of S&T achievements, and help research institutes make reasonable judgments of value when conducting technology ownership transfers (科技转让), technology licensing, and investment based on the assessed value of technology; and integrate patented and non-patented S&T achievements across institutes to form a strong portfolio and realize value-added and market gains for IP. **(Bureau of Sciences and Technology for Development, Chinese Academy of Sciences Holdings)**

7. We will establish a "Chinese Academy of Sciences Achievement Commercialization and IP Operations Fund," cooperate closely with the CAS IP Operations Management Center, and carry out redevelopment of key patents. We will support qualified CAS-affiliated organizations in seeking diversified investment from local governments and social resources, establish institute-level achievement conversion and IP operation funds, and independently or jointly establish specialized S&T achievement transfer and conversion organizations. We will also use market mechanisms to collaborate with globally recognized IP operation companies, and jointly support engineering and product development based on S&T achievements, so as to promote the application of S&T achievements and achieve value maximization. **(Chinese Academy of Sciences Holdings, Bureau of Science and Technology for Development, Bureau of Facility Support and Budget)**

8. We will give full play to the coordinating role of CAS branches, and continuously improve the system for S&T achievement transfer and conversion work throughout CAS. CAS branches shall assume management duties for all of CAS's S&T collaboration activities within the scope of their contact areas. They must actively organize their forces and adopt multiple methods to engage proactively in S&T linkage (对接) with local governments and enterprises, understand the development strategies and related work plans of local governments, grasp

their true needs, formulate work programs suited to the actual conditions of their regions, and provide targeted guidance for the local transfer and conversion of S&T achievements throughout CAS. **(CAS branches, Bureau of Science and Technology for Development)**

9. We will establish a hierarchically managed system for reporting S&T achievement transfer and conversion circumstances. CAS-affiliated research organizations shall report annually to the branches with which they are affiliated on the number of S&T achievements, conversion circumstances, related income and the distribution thereof, etc. The branches will summarize the information and submit annual progress reports, which will be included in CAS' annual statistical system and disclosed to the public, and will serve as important evaluation indicators for assessing the performance of research institutes throughout CAS. **(Bureau of Science and Technology for Development, CAS branches, research institutes)**

10. A unified S&T achievement information service platform will be constructed on the foundation of the existing "Industrialization Information Network" website ("产业化信息网") and "Intellectual Property Network," etc., and in conjunction with traditional forms such as S&T forums and achievement matchmaking events, commercializable S&T achievements will be released online and offline simultaneously. We will carry out screening and analysis of S&T achievement information jointly with professional organizations, and provide more professional consulting and evaluation, so as to promote IP investment and S&T achievement transfer and conversion. We will also explore establishment of an online competitive bidding mechanism, and provision of online-offline linkage services, to improve resource allocation efficiency during the transfer and conversion of S&T achievements into practical applications. **(Chinese Academy of Sciences Holdings, Bureau of Science and Technology for Development)**

(3) Develop and train teams of S&T achievement transfer and conversion talents

11. An Institute of Intellectual Property shall be established at the University of the Chinese Academy of Sciences (UCAS) to systematically develop talents specialized in IP; combining the educational resources of UCAS, the existing training system will be refined, standardized teaching materials shall be compiled, specialized courses will be introduced, and the training content will be improved; we will continue to implement the certification examination system for Intellectual Property Rights Commissioners, and at the same time, expand the coverage of basic training, so as to improve the awareness and ability of young S&T personnel of the whole institute with regard to the creation, application and protection of IP. **(Bureau of Science and Technology for Development, Bureau of Frontier Sciences and Education)**

12. In specific regions and fields, we will construct several "professional colleges," and explore new models for the diversified development of innovation and entrepreneurship talents based on industry-university-research institute collaboration. Based on the economic and social development requirements of relevant regions and fields, high-level lecturers with practical experience will be recruited from around the world to lecture, teach and dispel confusion, and to provide experience-based training, spark the entrepreneurial potential of graduate students and young S&T workers, cultivate an entrepreneurial spirit, and provide

society with interdisciplinary talents with a global vision. **(Bureau of Frontier Sciences and Education, relevant research institutes)**

13. We will rely on the "Legend Institute" ("联想学院") to develop innovation and entrepreneurship talents. Adhering to a pragmatic, market-oriented and international vision, we will build CAS' entrepreneurship training brand. We will refine the system of serialized training, including workshops, practical training classes and enterprise management training classes that combine S&T and the economy, as well as customized, locally oriented training, and will do our utmost to serve "popular entrepreneurship and mass innovation." Focusing on the gestation and incubation of S&T enterprises with strong vitality and sense of mission, we will build a new model of development integrating training, incubation and angel investment. **(Chinese Academy of Sciences Holdings)**

14. We will continue to dispatch S&T associates, enterprise technology envoys, etc., and organize the S&T staff of CAS to carry out in-depth, grassroots-level S&T achievement transfer and conversion activities. S&T staff will be encouraged to go to the front lines of enterprise production and carry out technology R&D to tackle key challenges, truly solve real problems for enterprises, and carry out S&T achievement transfer and conversion work together with enterprise employees. By establishing two-way, multi-level, long-term mechanisms for S&T staff to serve the grassroots, we will create a grassroots-oriented team for the transfer and conversion of S&T achievements into practical applications. **(Bureau of Science and Technology for Development)**

15. We will establish an "Industry and Research Institute Talent Support Project" to give key support to S&T talents who are engaged in S&T achievement transfer and conversion and can drive industrial upgrading. We will: Strengthen construction of specialized technology transfer and conversion teams, and intensify efforts to recruit and support high-level technology transfer and conversion talents; strengthen support for technology transfer and conversion talents in the context of state-supported (公派) study abroad programs; and explore the establishment in CAS-affiliated organizations of a qualification training system for technology transfer and conversion positions, which in practice will cultivate and select a group of backbone talents for technology transfer and conversion. **(Bureau of Personnel, Bureau of Science and Technology for Development)**

(4) Construct innovative vehicles for promoting the transfer and conversion of S&T achievements

16. We will: Enhance construction of S&T service network nodes, and integrate various commercialization platforms built with local governments and enterprises, strengthening management and forming joint forces; lay out STS regional centers oriented towards the major requirements of innovation-driven development, and fully exploit the ability of STS centers to focus on major S&T issues and provide overall coordination; raise the S&T service ability and sustainable development ability of existing platforms, and promote the construction of regional innovation systems; and organize and carry out technology integration and innovation, and engineering application demonstration, so as to promote the product development and

industrialization of S&T achievements, and serve regional industrial development. **(Bureau of Science and Technology for Development, relevant research institutes)**

17. Using "technology innovation and industrialization alliances" as the vehicle, we will utilize the leading role played by CAS-invested enterprises in areas such as selecting key industries, grasping industrial technologies, planning for technology innovation, and allocating R&D resources. We will select several key industry segments, concentrate and integrate the strengths of CAS-related enterprises and research institutes in R&D, pilot testing, production and target markets, and carry out coordinated R&D of key technologies and new products. While promoting the conversion of S&T achievements into practical applications, we will incubate a number of "hidden champion enterprises" ("隐形冠军企业") for industries, and form a CAS S&T industrial innovation cluster. **(Chinese Academy of Sciences Holdings)**

18. New types of incubators and investor supermarkets will be constructed, combining industry, academia, research institutes, users and capital, as well as policy support, to provide a full spectrum of S&T support services, market resources and financial services. Relevant forces within CAS will be integrated to form a S&T incubation network system with nationwide chain operation and global cooperation. It will provide S&T startups relatively comprehensive support services, and help entrepreneurial teams smoothly traverse the "first mile." **(Chinese Academy of Sciences Holdings, Bureau of Science and Technology for Development)**

19. We will strengthen construction of national engineering laboratories, engineering (technology) research centers, and other scientific research bases. Through methods such as R&D of generic technologies, carrying out engineering validation, and formulating technology standards, they will become bridges and links for strong alliances with enterprises. In accordance with the nation's requirements for the overall reform of these types of institutions, and giving full play to their role in supporting the integration of S&T resources and promoting the conversion of S&T achievements into practical applications, we will construct specialized "makerspaces" ("众创空间"), increase their ability to serve the technological progress of industry and particular industries, and open up to the market the "last mile" in applying technology. **(Bureau of Science and Technology for Development)**

20. Construction of open shared service platforms for large-scale machines (仪器) will be strengthened, and we will build industrial technology innovation platforms with large scientific centers as their core. We will continue to refine the two-level support system of "regional centers for large-scale machines" and "institute-level public technology service centers," while also playing close attention to the function of major national S&T infrastructure facilities in serving technology R&D, and to the industrialization spillover of their own innovative technology, and we will increase efforts to open them to industrial sectors. We shall break down the "stovepipes" between research institutions, constantly improve the performance of machines and facilities, promote cross-institutional sharing of machines and joint use of facilities, and help users jointly resolve major industrial technology issues. Relying on facilities such as the Shanghai Synchrotron Radiation Facility, Hefei's National Synchrotron Radiation Laboratory, the Beijing Electron Positron Collider, the Steady High Magnetic Field Facility in Hefei, and the Heavy Ion Research Facility in Lanzhou, we will build, operate and manage a new model of integrated resource allocation, and organize special teams to help achieve open

sharing of S&T facilities and resource platforms with the public. **(Bureau of Facility Support and Budget)**

21. We will enhance construction of the All-China Academy Alliance, the Field Station Alliance, the China Botanical Garden Alliance, and other cross-sectoral platforms. Together with local academies, we will construct joint laboratories and engineering centers, jointly undertake R&D projects, and organize efforts to achieve technological breakthroughs. We will: Successfully combine field station observation networks and research under top-level design, promote multidisciplinary cross-fertilization, and improve capacity for serving the nation's major needs; systematically carry out research on the functional evaluation of strategic biological resources and their exploration and utilization, open up smooth pathways for the conversion of biological resources into biotechnology products, and provide resources and systematic solutions for the development of the biotech industry. **(Bureau of Science and Technology for Development)**

(5) Create an environment and culture conducive to the transfer and conversion of S&T achievements into practical applications

22. Supportive policies and systems for implementing the *Law on Promoting the Conversion of Scientific and Technological Achievements* will be formulated. We will issue *Guiding Opinions of the Chinese Academy of Sciences on Accelerating the Transfer and Conversion of Scientific and Technological Achievements*, along with supportive policies and systems covering personnel, evaluation, etc., and guide CAS-affiliated organizations in closely combining the work of promoting S&T achievement transfer and conversion with their own management and operations, and with their own reform and development. We will also refine the relevant regulations on S&T personnel taking leave for entrepreneurship or working part-time in enterprises, clarify the innovation and entrepreneurship rights and obligations of S&T personnel, and create a culture throughout CAS that encourages innovation and entrepreneurship. In terms of S&T values, we will guide S&T personnel to correctly understand and appreciate the importance of promoting the transfer and conversion of S&T achievements, and rationally involve themselves in innovation and entrepreneurship. **(Bureau of Facility Support and Budget, Bureau of Personnel, Bureau of Development Planning Bureau of Science and Technology for Development)**

23. We shall continue to generate high-quality S&T achievements in accordance with the requirements of "supply-side" reform. For Strategic Priority Research Program special projects (战略性先导科技专项), STS projects, key deployment projects, etc., that address the major needs of the country and the main battleground of the domestic economy, and which are independently laid out by CAS, we shall adhere to the project establishment standards of "clear goals, assessable, usable, and influential," and strictly control project "entry." With regard to the project completion circumstances of projects of different natures, such as demonstration and transfer of technology packages, special R&D and joint research projects, commissioned studies and special consultancies, public testing and platform testing, etc., we will implement categorized (分类) examination and acceptance, and strictly control project "entry." **(Bureau of Development Planning, Bureau of Frontier Sciences and Education, Bureau of Major R&D Programs, Bureau of Science and Technology for Development)**

24. In accordance with the requirements of the categorization-based positioning and management of research institutions, categorization-based evaluation and assessment will be implemented for "four types of institutes" ("四类机构"), and the evaluation system oriented toward major outputs will be further refined, with performance in S&T achievement transfer and conversion made an important indicator of the innovation performance of relevant CAS-affiliated organizations, and actual economic and social contributions serving as important content in annual data monitoring. In the context of job promotions and performance evaluations, we will encourage and guide CAS-affiliated organizations to formulate differentiated evaluation criteria for technology transfer and achievement commercialization work. **(Bureau of Development Planning, Bureau of Frontier Sciences and Education, Bureau of Major R&D Programs, Bureau of Science and Technology for Development, Bureau of Facility Support and Budget, Bureau of Personnel)**

25. Relying on the S&T cooperation organizations CAS has established overseas, and in line with the national "Belt and Road" strategy, we will transfer and commercialize appropriate S&T achievements on the basis of intercommunication and mutual benefit. Relying on the "Programs for Deepening S&T Cooperation with Developing Countries," we will support CAS-affiliated organizations in joining with relevant domestic enterprises and overseas innovative enterprises, universities, or scientific research institutions, to set up international collaborative innovation centers. In fields where CAS has independent IP and international comparative advantage, we will promote the transfer of CAS' mature technologies to developing countries. Using strategic partnerships, combined with CAS' strong resource channels, we will promote "introduction, digestion, absorption and re-innovation" ("引进、消化、吸收再创新") work. Relying on the CAS President's International Fellowship Initiative (PIFI), we will begin to build an internationalized human resources network by recruiting foreign innovation and entrepreneurship talents. **(Bureau of International Cooperation, Chinese Academy of Sciences Holdings)**

III. Organization and Implementation

(1) Integrate and enhance organizational leadership

The "Special Project on Transfer and Conversion of Scientific and Technological Achievements" is an organic component of CAS's "Take the Initiative" program. Under the unified leadership of the CAS Party Group, the Bureau of S&T for Development shall take the lead responsibility for promoting implementation. This implementation plan has determined the departments responsible for each key task based on the functional division of labor. Led by the heads of the respective academies, a joint meeting system and corresponding coordination mechanism will be established at CAS headquarters to promote implementation of major policy matters and execution of specific tasks, in a categorization-based, hierarchical and step-by-step manner.

(2) Increase resource investment through multiple channels

CAS shall establish a special project fund of 500 million yuan Renminbi (RMB) to be used for "Key Special Projects for the Transfer and Conversion of Scientific and Technological

Achievements," and will explore "after-project subsidies" and other methods of promoting the extension and application of major achievements. At the same time, among Strategic Priority Research Programs and Key Deployment Projects deployed independently by CAS, suitable preference will be given to work directed towards the major needs of the nation and the main battleground of the domestic economy. We will actively attract social capital and compete for relevant national guidance funds for setting up the Achievement Commercialization and IP Operations Fund, and give investment, financing and operations management support to the S&T enterprises or project companies formed by the conversion of our S&T achievements (IP) into practical applications.

(3) Step up outreach efforts across the board

We will maintain close contact and collaboration with relevant national agencies and local governments, so that implementation of the "Special Project for the Transfer and Conversion of S&T Achievements into Practical Applications" is connected with the national and local 13th Five-Year Plans, and proactively integrate it with the overall environment of industrial upgrading and regional transformation.

Division of Key Tasks and Schedule

No.	Key Task	Task Breakdown	Lead Agency	Schedule
1	Promote a number of major S&T achievement outputs and implement conversion into practical applications	In conjunction with the deployment of Class-A Priority Research Programs and construction of Innovation Academies, promote conversion of a number of major achievements into practical applications, and launch deployment of a number of R&D projects with clear application exports	Bureau of Major R&D Programs	Continue to advance
2		Further enhance the forward-looking layout for industrial applications of already deployed Class-B Priority Research Programs	Bureau of Frontier Sciences and Education	Continue to advance
3		Continue to advance the "Science and Technology Service (STS) Network Program," and accelerate extension of practical technologies	Bureau of Science and Technology for Development	Continue to advance

4		Establish "Key Special Projects for the Transfer and Conversion of S&T Achievements," and implement around ten key special tasks	Bureau of Science and Technology for Development	Complete relevant project registration preliminary research before June 2016, and continue to advance
5		Strengthen effective "three-chain" linkage of the innovation chain, production chain and capital chain, and lay out a bastion for emerging industries	Chinese Academy of Sciences Holdings	Continue to advance
6	Establish a S&T achievement management system with IP as its core	Establish a "Chinese Academy of Sciences IP Operations Management Center"	Bureau of Science and Technology for Development	In 2016, complete preparation for construction, and continuously advance construction
7		Establish a "Chinese Academy of Sciences Achievement Commercialization and IP Operations Fund"	Chinese Academy of Sciences Holdings	In 2016, establish, and expand continuously
8		Give full play to the coordinating role of CAS branches, and formulate work programs based on the actual conditions of designated contact areas	CAS branches	Complete formulation of programs by June 2016
9		Establish a hierarchically managed system for reporting S&T achievement transfer and conversion circumstances	Bureau of Science and Technology for Development	Initiate in November 2016, complete annually
10		Construct a CAS-wide unified S&T achievement information service platform	Chinese Academy of Sciences Holdings	In 2016, complete construction and improve continuously

11	Develop and train teams of S&T achievement transfer and conversion talents	Establish Chinese Academy of Sciences IP Operations Management Center	Bureau of Frontier Sciences and Education	In 2016, complete preparation for construction, and continuously advance construction
12		Construct several "professional colleges" integrating science education	Bureau of Frontier Sciences and Education	Continue to advance
13	Develop and train teams of S&T achievement transfer and conversion talents	Refine the "Legend Institute" training system for developing innovation and entrepreneurship talents, explore new models	Chinese Academy of Sciences Holdings	In 2016, launch public-oriented training, continue to advance
14		Continue to dispatch S&T associates and enterprise technology envoys	Bureau of Science and Technology for Development	Continue to advance
15		Establish "Industrial Research Talent Support Project"	Bureau of Personnel	Selection of first group completed, continue to advance
16	Construct innovative vehicles for promoting the transfer and conversion of S&T achievements	Lay out STS regional centers, serve regional industrial development	Bureau of Science and Technology for Development	First group of pilots has been initiated, continue to advance
17		Build technology innovation and industrialization alliances, incubate "hidden champions" of industries	Chinese Academy of Sciences Holdings	Continue to advance

18		Construct "new incubators" and "investor supermarkets," provide relatively comprehensive incubation services for S&T startup enterprises	Chinese Academy of Sciences Holdings	In 2016, launch and continue to advance
19	Construct innovative vehicles for promoting the transfer and conversion of S&T achievements	Strengthen construction of national engineering laboratories, engineering (technology) research centers, and other generic technology research bases, build professionalized makerspaces, improve CAS' S&T service capabilities for industry	Bureau of Science and Technology for Development	In 2016, launch and continue to advance
20		Strengthen construction of open shared service platforms for large instruments, refine the support system	Bureau of Facility Support and Budget	Continue to advance
21		Build industrial technology innovation platforms with large scientific centers as their core, and serve S&T achievement transfer and conversion through technology spillovers	Bureau of Facility Support and Budget	Continue to advance
22		Strengthen construction of the All-China Academy Alliance, organize technology breakthrough research serving regional industrial development	Bureau of Science and Technology for Development	Continue to advance
23		Strengthen construction of the Field Station Alliance (野外台站联盟), promote interdisciplinary cross-fertilization, serve national requirements	Bureau of Science and Technology for Development	Continue to advance

24		Strengthen construction of the China Botanical Garden Alliance, open up channels for conversion of biological resources into biotechnology products	Bureau of Science and Technology for Development	Continue to advance
25	Create an environment and culture conducive to the transfer and conversion of S&T achievements into practical applications	Formulate and issue <i>Guiding Opinions of the Chinese Academy of Sciences on Accelerating the Transfer and Conversion of Scientific and Technological Achievements</i> along with supportive policies and systems covering personnel, evaluation, etc.	Bureau of Facility Support and Budget	Continue to advance in conjunction with national policies
26		Strengthen "supply-side" reform, continuously refine related systems, clarify the value orientation, promote output of high-quality S&T achievements	Bureau of Development Planning	Continue to advance
27		Implement categorization-based evaluation and assessment, refine evaluation systems of research institutes oriented towards major outputs, drive reform and management innovations in research institutes in areas such as resource allocation, project evaluation, personnel evaluation, etc.	Bureau of Development Planning	Continue to advance
28		Relying on S&T cooperation organizations already established, transfer and commercialize appropriate [Chinese] S&T achievements overseas	Bureau of International Cooperation	Continue to advance
29		Implement Programs for Deepening S&T Cooperation with Developing Countries	Bureau of International Cooperation	Continue to advance
30		Implement the President's International Fellowship Initiative (PIFI)	Bureau of International Cooperation	Continue to advance

