Translation

The following article describes China's "National Security Academic Fund," which supports the China Academy of Engineering Physics (CAEP), China's nuclear weapons research, development, and testing laboratory. Notably, experts from hundreds of institutions in dozens of countries have co-authored research papers subsidized by this fund, research that presumably benefits CAEP.

Title

Twenty Years of the NSAF Joint Fund: Exploration and Practice of a New Model for Strengthening Requirement-Led Basic Scientific Research Collaboration and Innovation[1]
NSAF联合基金二十年:强化需求牵引的基础科研协同创新模式探索与实践

Authors

Wang Na (王娜), Li Huihong (李会红), Lin Ting (林婷), and Liu Dongyan (刘冬燕). Co-lead author Dr. Wang Na is a senior engineer and project manager in the Development Tasks Division (发展任务处) of the Scientific Research and Technology Department (科研技术部) of the China Academy of Engineering Physics (CAEP; 中国工程物理研究院; 中物院). Co-lead author Dr. Li Huihong is a researcher in the Department of Mathematical Sciences (数理科学部) at the National Natural Science Foundation of China (NSFC; 国家自然科学基金委员会). Co-author Lin Ting is affiliated with the CAEP Science and Technology Information Center (科技信息中心). Co-author Liu Dongyan is a researcher at CAEP and is the head of the Development Tasks Division of the Scientific Research and Technology Department of CAEP.

Source

Bulletin of National Natural Science Foundation of China (中国科学基金), extra issue (增刊) published December 10, 2021, pp. 103-109. *Bulletin of National Natural Science Foundation* is a bimonthly journal published by (主办) and overseen by (主管) NSFC.

The Chinese source text is available online at:
https://www.nsfc.gov.cn/csc/20345/20348/pdf/2021/2021zk-103-109.pdf
An archived version of the Chinese source text is available online at: https://perma.cc/A6ZE-LTZA
U.S. $1 ≈ 6.9 Chinese Yuan Renminbi (RMB), as of April 3, 2023.

Translation Date	**Translator**	**Editor**
April 3, 2023	Etcetera Language Group, Inc.	Ben Murphy, CSET Translation Manager

[1] Translator's note: The Chinese-language original version of this article supplies a different, less accurate English title: "A Review of the Fund Support and Management of NSAF for 20 Years."

Twenty Years of the NSAF Joint Fund: Exploration and Practice of a New Model for Strengthening Requirement-Led Basic Scientific Research Collaboration and Innovation

1. Introduction

National security is an important cornerstone of peace and stability. Currently, the national security environment is undergoing deep and complex changes. China remains in an important period of strategic opportunity for its development. Only by selecting the right breakthroughs and achieving advanced arrangements, strengthening forward-looking, pioneering, and exploratory national security basic scientific research and new concept research, we may then proactively gain competitive advantages, offering strong support for solidifying the foundation of national security.

The China Academy of Engineering Physics (hereinafter referred to as "CAEP") is the sole nuclear weapons research, development, and production unit of China under state planning. It is a comprehensive research institute embodying theory, experiment, design, and production, mainly aiming to develop cutting-edge national defense science and technology (S&T). CAEP was established in 1958. The older generation of CAEP researchers was indifferent to fame, and devoted themselves to their work, realizing the brilliant achievements of nuclear bombs and ballistic missiles[2] under arduous conditions. With its special business and remote location, CAEP is chronically understaffed with basic research talent and finds it hard to attract new talent. To attract and coordinate the strengths of institutions of higher learning and scientific research institutes across the country to start basic research related to national security, discover new research directions, nurture high-tech national defense talent, and promote innovation at the source (源头创新) in national security-related fields, the National Natural Science Foundation of China (hereinafter referred to as "NSFC") and CAEP started their pilot projects in 2000. In 2001, the two organizations signed a contract and officially established the National Security Academic Fund[3] (referred to as

[2] Translator's note: The Chinese here, 两弹, literally means "two bombs," and is part of the abbreviation 两弹一星 "two bombs and one satellite," which refers to China's Mao Zedong-era accomplishments of building its own nuclear bombs (原子弹), ballistic missiles (导弹), and earth satellites (卫星). The term 两弹 is often misconstrued as "atomic and hydrogen bombs." See William Hannas and Huey-Meei Chang, "China's STI Operations: Monitoring Foreign Science and Technology Through Open Sources," Center for Security and Emerging Technology, January 2021, p. 27, https://cset.georgetown.edu/publication/chinas-sti-operations.

[3] Translator's note: The Chinese-language original version of this article supplies the English translation "National Safety Academic Fund" for the Chinese term 国家安全学术基金. This is probably an attempt by the authors to make the name of the fund sound benign to foreign audiences. While the Chinese word 安全 can be translated as either "security" or "safety" depending on context, the term 国家安全

the NSAF Fund or NSAF Joint Fund) jointly. NSAF is among the first batch of the Joint Fund pilot projects of NSFC. Up to now, an agreement for a total of 5 phases has been signed. It is the Joint Fund with the longest length of implementation. This article organizes and reviews the achievements of the NSAF Fund since its establishment and implementation, summarizes sponsorship and management of the Joint Fund, and predicts future developments.

2. Funding

2.1 Expenditures and Investments

From 2001 to 2020, NSFC and CAEP signed a total of 5 phases of the "NSAF Joint Fund Agreement," and 4 "Supplemental Agreements." Until 2020, the NSAF Fund has invested 729 million Chinese yuan Renminbi (RMB), including an RMB 324 million investment from NSFC, and an RMB 405 million investment from CAEP. Funding has grown from RMB 10 million per year in 2001 to RMB 75 million per year in 2020 (as shown in Figure 1).

2.2 Applied-for and funded projects

Until 2020, the NSAF Fund is divided into three sub-categories, namely incubation projects, key supporting projects, and science center projects, supporting a total of 847 projects, including a total of 785 incubation projects, the average funding of which increased from RMB 110,000 per project in 2001 to RMB 500,000 per project in 2020 (direct funding); a total of 56 key supporting projects, the average funding of which increased from RMB 730,000 per project in 2004 to RMB 3 million per project in 2020 (direct funding); and a total of 6 science center projects, the average sponsorship of which is RMB 10 million per project per year (total funding).

Please see Figure 2 for the number of applied-for and funded projects of the NSAF Fund by year. The number of projects funded by the NSAF Fund per year remains within the range of 30 to 40 projects. Within Phase 5 of the Agreement (from 2019 onwards), the ratio of key supporting projects of the NSAF Fund continues to increase; thus, the number of sponsored projects of the year has decreased as compared to that in Phase 4 of the Agreement.

unambiguously translates to "national security," not "national safety." This translation thus adopts the more accurate translation "National Security Academic Fund."

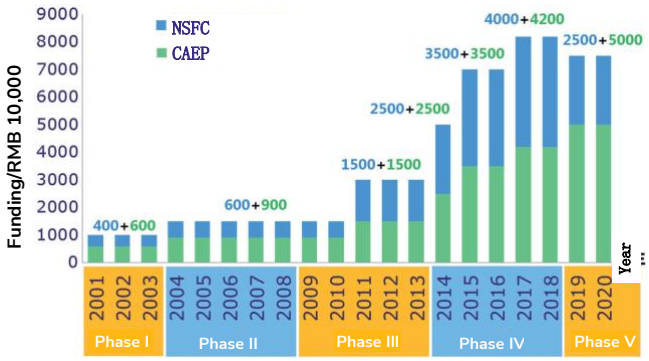

Figure 1 Funding investment and agreements signed by the NSAF Fund

In terms of funding rate by year (Figure 3), before 2018, the funding rate of the NSAF Fund was basically between 35% and 55%. Since 2019, the funding rate decreased drastically, indicating a significant increase in the influence and participation of the NSAF Fund in China.

3. Implementation Results

3.1 Attracts outstanding S&T forces across China, creating a military-civil S&T collaboration and innovation model

The NSAF Fund has broken new ground for CAEP in attracting technological forces across China to start basic research with the pulling force of national security requirements (需求), putting an end to CAEP's silent, lonely battle domestically due to its special business and remote location. Before establishing the NSAF Fund, the collaboration between CAEP and relevant units in China mainly relied on signing end-to-end contractual agreements, seeking external foreign research assistance, and more. The depth and width of said collaborations were somewhat limited. In the more than 20 years since its establishment, a total of 137 units (单位) have received NSAF project funding. They include (a) 90 institutions of higher learning (accounting for 66%), making up 81% of the total number of funded projects; and (b) 47 scientific research institutes (accounting for 34%), making up 19% of the total number of funded projects. Of these 137 units, 115 are non-military industry units (accounting for 84%), making up 85% of the funded projects, and 22 military industry-related research institutes and universities (accounting for 16%), making up 15% of the funded projects, thus creating a new collaboration and innovation model combining science with education.

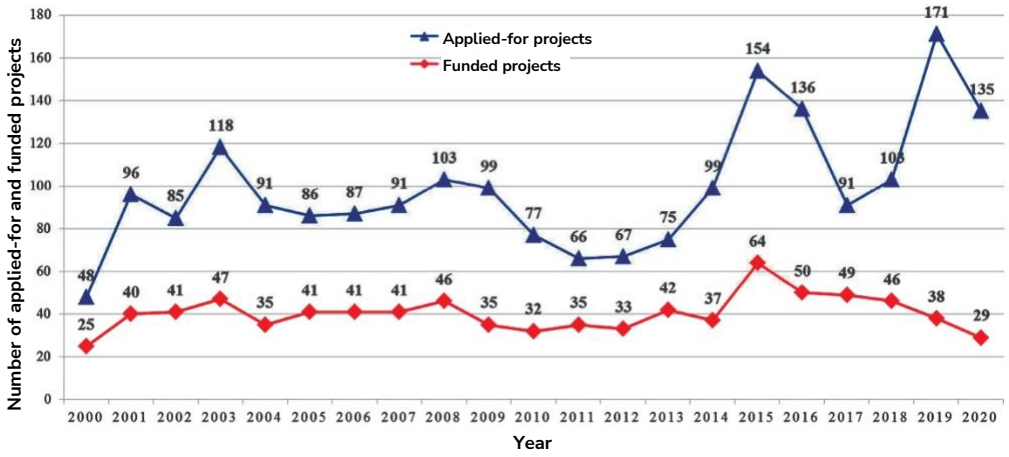

Figure 2 Number of applied-for and funded projects of the NSAF Fund by year

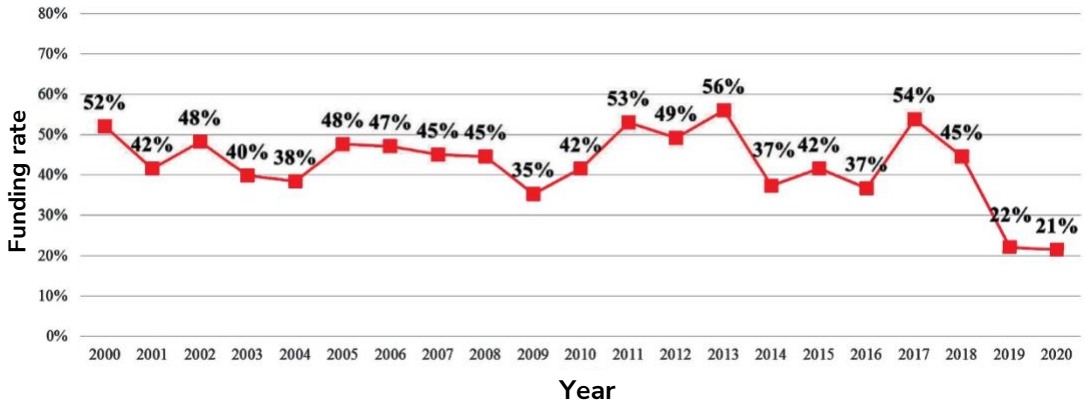

Figure 3 Funding rate of the NSAF Fund by year

Under the funding and guidance of the NSAF Fund, through working jointly on technology plans and projects, participating in S&T research at CAEP's national defense technology key laboratories (国防科技重点实验室) and Academy-level (院级) key laboratories, seeking external scientific research assistance, conducting joint training of graduate students, and other methods, dozens of cross-organizational scientific research collaboration and innovation teams in plasma physics, computational physics, energetic materials, etc. that take CAEP requirements as their core [mission] have formed. On this basis, CAEP formed strategic partnerships with many colleges, universities, and scientific research institutes, creating a scientific research collaboration and innovation network focusing on basic science for national security.

Meanwhile, funding through the NSAF Fund has indirectly broadened the channels for international collaborative research. Authors of articles funded by the NSAF Fund hail from nearly 1,300 research institutes in 64 countries and regions (524 of which are foreign research institutes).

3.2 Persist in being requirement-led and problem-oriented, serving national security and major strategic requirements

The NSAF Fund persists in being requirement-led and problem-oriented. To "strengthen basics, make up for shortcomings, and expand directions" ("强基础，补短板，拓方向"), the Fund is devoted to attracting and coordinating well-positioned (优势) S&T forces across China to start basic scientific research jointly and serve national security and major strategic needs. To "strengthen basics," the NSAF Fund funded around 310 research projects (36% of the total) about the mechanisms and principles behind engineering technological issues, experimental phenomena, and more from the basic science perspective, strengthening understanding of the principles and laws of key "chokepoint" ("卡脖子") problems, going from "knowing it is so" to "knowing why it is so." In terms of "making up for shortcomings," the NSAF Fund focuses on key S&T issues in CAEP's scientific research production tasks. By coordinating and utilizing the S&T research powers of well-positioned teams in China, the NSAF Fund started over 450 research projects (53% of the total) in new technologies, new methods, new materials, new algorithms, new processes, and more, offering new thinking and new methods for scientific research production tasks in the national security field. The results of part of this research have been verified or further developed for application. To "expand directions," by establishing "encouraged directions for research" ("鼓励研究方向") projects with big science equipment (大科学装置) available for external use (对外开放) respectively, the NSAF Fund developed and nurtured emerging scientific research directions for national defense demands such as the terahertz [free electron laser].

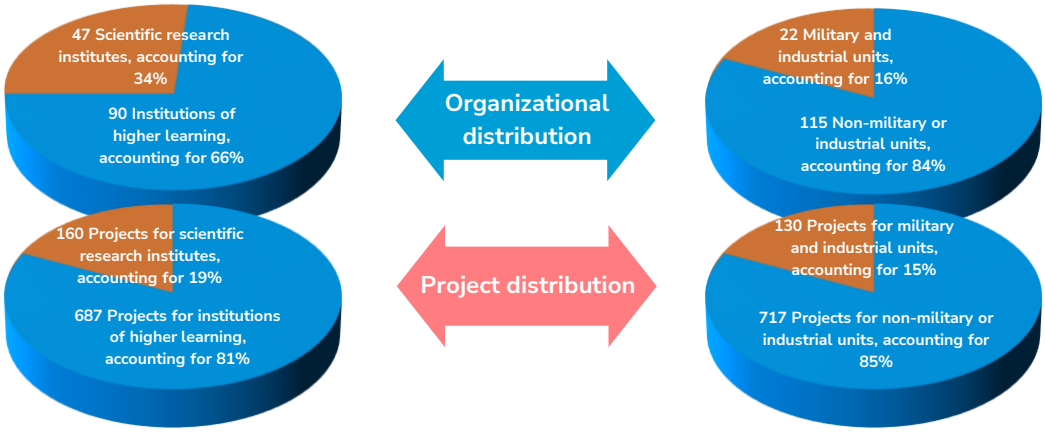

Figure 4 Distribution of projects funded by the NSAF Fund

In terms of optimizing the preparation process for uranium materials, a joint scientific research team systematically revealed the law of interaction between nitrogen and uranium from the microscopic perspective through theoretical simulations

and experiments. Based upon the “self-stabilizing” anti-oxidation performance of nitrided surfaces, and the traditional anti-corrosion principles of blocking contact between the surface and corrosive materials, the team proposed the new design of nitriding uranium surfaces to form a self-stabilizing coating to protect its surface, thereby realizing controlled preparation of nitrided layers. Nitriding surfaces can effectively enhance metal uranium’s resistance to atmospheric corrosion, fulfilling the requirement for process stability in engineering applications, and laying an important foundation for solving corrosion problems of uranium in engineering applications.

Based upon precise experimental requirements, and with the funding and guidance of the NSAF Fund, a scientific research team successfully researched and produced a compact, electromagnetically driven, high-energy density, dynamic experimental device (abbreviated “CQ-7”), realizing a series of breakthroughs, from basic principles of the device, to loading key technologies, to device integration. The team started research on the dynamic behavior of materials under quasi-isentropic compression (准等熵加载), bringing the level of China’s electromagnetically driven, high-energy density, dynamic experimental device from zero to the highest level of the same device internationally. The CQ-7 device has a discharge peak power of 7.1 MA, and a rise time of 222 ns. It can drive aluminum flyers of 6 mm x 6 mm x 0.35 mm to a speed faster than 16 km/s, which is better than the standards of similar devices internationally (the VELOCE device of the Sandia National Laboratories of the United States and the GEPI device of CEA of France: with a discharge peak power of 3~4 MA, rise time of 400~600 ns, and an aluminum flyer speed of 10.4 km/s). It has not only laid a foundation for research on weapon physics and material physical dynamics under extreme conditions but has also provided a unique experimental platform for high-energy-density physics research.

In terms of enhancing weapon experimental diagnosis capabilities, in situ, transient, lossless, and complex environments are “chokepoint” problems for diagnosis technologies and devices. In the research on stability control of micro-inertial devices, a project team built a microaccelerometer closed-loop feedback interface electrical circuit system model. The stability of the microaccelerometer sensor module they researched and developed is greatly enhanced, realizing independent (自主) research and development (R&D) of core components.

3.3 Support the development of key disciplines in the national security field, and promote the generation of original and major scientific research achievements

From the subject distribution of projects funded by the NSAF Fund (Figure 5), the main disciplines funded by the NSAF Fund include electronic science and technology, mechanics, physics, materials and chemistry, optical engineering, and also include disciplines such as mechanical engineering, mathematics, nuclear science and

technology, weapons science and technology, and more.

From article publication of projects funded by the NSAF Fund (Figure 6), through December 2020, projects funded by the NSAF Fund have published a total of 15,295 articles. 44.4% of the articles published by projects funded by the NSAF Fund were published in the top 25% of journals, and 28.7% were published in the top 25% to 50% of journals. In general, the articles are of high quality. Amongst these, there was a total of 80 ESI highly cited papers, the research directions of which involve computer science, energetic materials, chemistry and cross-disciplinary subjects, nanoscience and nanotechnology, and more, showing that NSAF Fund financial support has significantly enhanced academic standards and impact in relevant fields.

Taking energetic materials as an example, the NSAF Fund has funded a total of 7 key supporting projects in the field of energetic materials since its establishment, which is 12.5% of the total number of key supporting projects. The NSAF Fund subsidizes well-positioned units' collaboration with CAEP, starting broad but in-depth research in areas such as design of new explosives, research on synthesis and

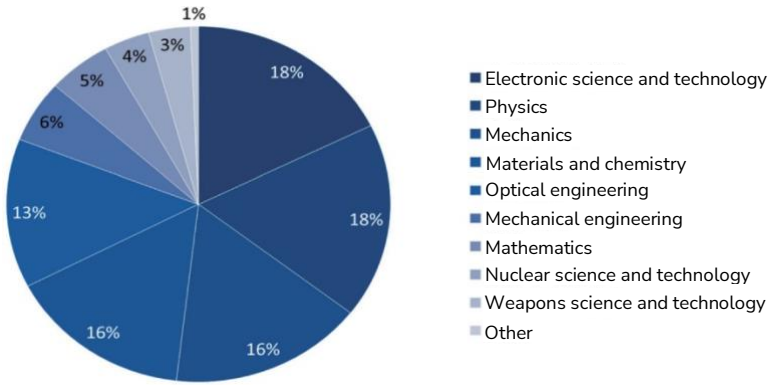

Figure 5 Discipline distribution of projects funded by the NSAF Fund

mechanisms, exploration of graphene and the application of its modifications in explosives, research on energetic nanomaterials and devices, research on the process of the PBX explosive formation and detonation process, and more. For example, in terms of ultra-high-energy energetic materials research, the discovery of total-nitrogen ultra-high-energy explosives by a university scientific research team funded by the NSAF Fund has attracted the broad attention of international counterparts. Total-nitrogen ultra-high-energy explosives (全氮超高能炸药) have become a research hotspot of energetic materials in major military powers across the world (国际军事大国), because of their strengths such as high energy (its energy level is more than three times that of TNT explosive), low pollution, low signal, and more. The scientific research team has started research on the synthesis mechanism of stable chemical compounds and achieved breakthroughs in ionic total-nitrogen ultra-high-energy

materials research. It successfully synthesized the sodium, manganese, iron, cobalt, and magnesium salt hydrate of total-nitrogen pentazolate anion for the first time in international history, occupying the international commanding heights of the new generation of ultra-high-energy energetic materials research, and providing the technological foundation for actual applications. It is expected to raise the level of explosive power in China's weapons and equipment. Achieving relevant results in 2017 has provided important data support and theoretical grounding for China to report the crystal structure of total-nitrogen pentazolate anions in *Science* and *Nature* for the first time.

4. Management Measures

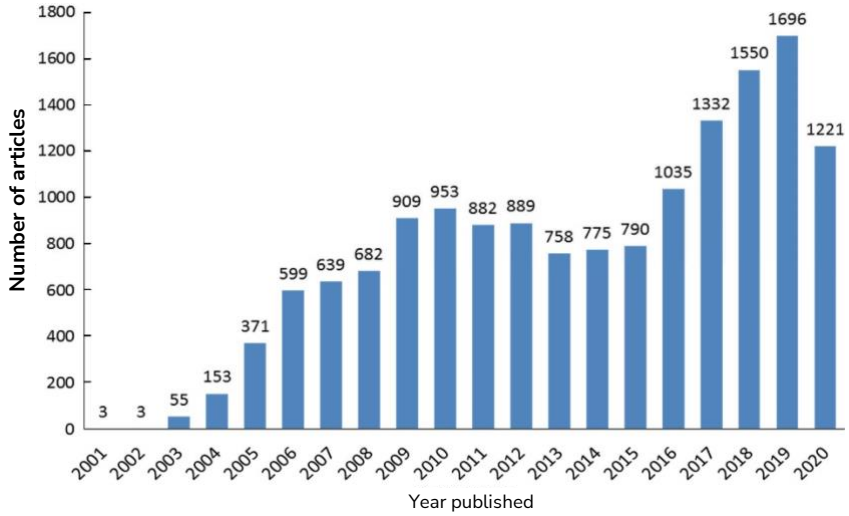

Figure 6 Articles Published by Projects Funded by the NSAF Fund

4.1 Top-level strategy, continuing to optimize reform

As the first joint fund established by the NSFC and national industrial departments, the NSAF Fund has long been highly valued by NSFC and CAEP leadership. Taking the opportunity to sign an agreement every five years, leaders of both parties meet to discuss top developmental strategies for the NSAF Fund, indicating the direction for future development. The NSFC Mathematical Science Department and the CAEP Scientific Research and Technology Department established the NSAF Joint Fund Office jointly, which is responsible for preparing guidelines, approving and evaluating projects, tracking and managing, examining and accepting completion of projects, and more.

Under top-level strategic guidance, the NSAF Fund has continuously optimized reform for the last 20 years. In the pilot project in 2000, the NSAF Fund mainly established "incubation projects," which included two categories, namely "clarifying

target topics" and "encouraging research directions." The "clarifying target topics" category focuses on guiding scientific researchers in China to research basic scientific topics related to the specific requirements for the national security field proposed by CAEP. The "encouraging research directions" category guides researchers to expand new research directions related to said requirements. In 2006, the NSAF Fund added the "key supporting projects" category, funding more systematic and in-depth research surrounding key and basic scientific topics of the national security field. In 2015, the NSAF Fund added the "research center projects" category, focusing on research directions with great potential application value in fields related to national security, providing a stable platform to concentrate on developing basic science and cutting-edge research. In 2019, faced with the new conditions and challenges of the new era, the NSAF Fund implemented Phase V agreement reforms surrounding the goal to "further focus on requirements, achieve a forward-looking arrangement, and expand openness." Incubation projects aim to expand public sharing of national large-scale scientific devices, and promote communications and collaborations. Key supporting projects focus on key bottleneck problems in the national strategic security field, emphasizing future potential application and cross-disciplinary innovation, and starting forward-looking, disruptive basic scientific research. Guidelines for research center projects were publicly announced nationwide.

4.2 Persist in being requirement-led, grasp sources of guidelines

The NSAF Fund stays true to its original founding mission and persists in being requirement-led. During Phase I to Phase IV, the 3-Level Review Mechanism was adopted for guideline preparation. Firstly, various research institutes of CAEP propose suggestions for topic directions from below, which are then reviewed by the institutes and sent to CAEP for approval. Secondly, CAEP organizes experts from its topic teams to pick topic directions, acting as gatekeepers of subject arrangements and requirement relevance. Thirdly, the Joint Fund Office organizes expert teams to discuss and review, acting as gatekeepers overseeing the basic [research] nature, innovativeness, and overall quality of the guidelines. This bottom-up 3-level review model ensures consistency of funding directions and demands. The guidelines cover broad contents, guiding and solving a series of actual scientific and technological problems.

From Phase V onwards, surrounding the goal to focus more on requirements and realize systematic arrangement, CAEP established the NSAF Fund expert team. CAEP directly organizes strategic scientists working on national security tasks to study and discuss core and key problems arising in national security tasks, forming guidelines for key supporting projects from the bottom up. The scope of guidelines is more focused. The key supporting direction remains unchanged for five years, which is beneficial for

promoting continuous and in-depth research focusing on key issues.

4.3 Maintain close communication throughout the process, promote project implementation

Organizing the signing of the *NSAF Fund Project Agreement* is a management measure that the NSAF Fund has persisted in since its establishment. After a new project is approved, a tripartite agreement is signed between the unit proposing guidelines, the unit entrusted with the project (项目依托单位), and the NSAF Joint Fund Office, clarifying the project plan and form of results, as well as the responsibilities of

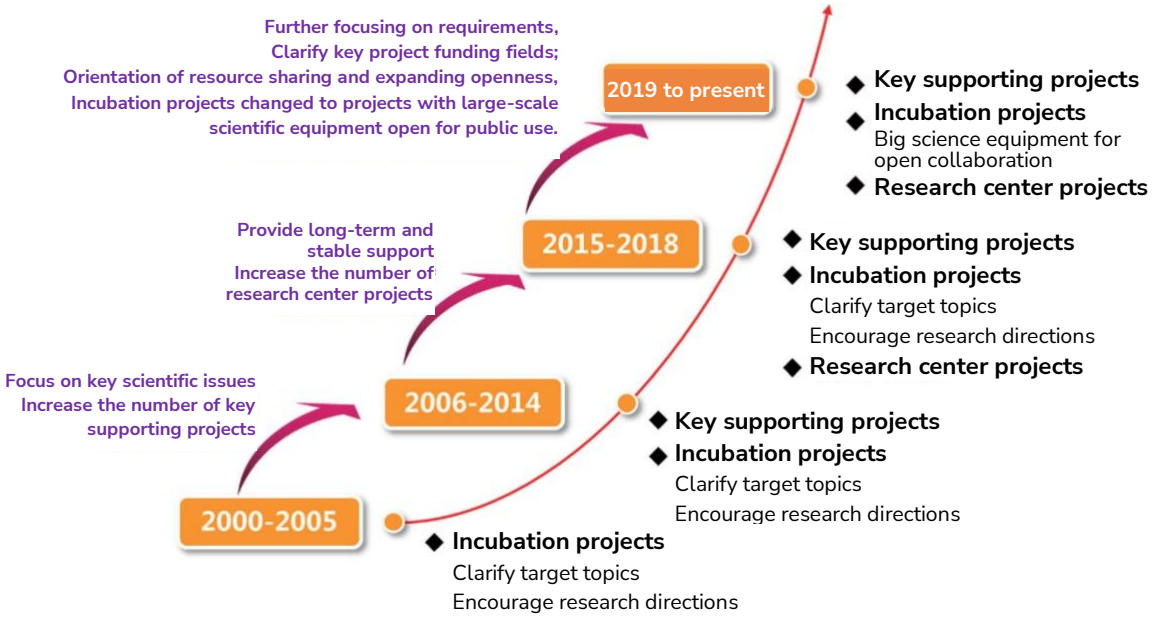

Figure 7 Reform and Development Scheme for the NSAF Fund Financing Model

all parties, setting a plan for collaboration and exchange. The Agreement is one of the bases for accepting the completion of projects.

Moreover, since 2019, after the NSAF Fund guidelines are published every year, CAEP organizes and holds the NSAF Fund Guidelines Propaganda Symposium for counterpart experts in related fields across China. Through expert explanations and on-site communications to strengthen propaganda, this deepens understanding of the requirements of counterparts in China. This measure has effectively improved the fit (契合程度) of the NSAF Fund impacts, applications, and guidelines. The number of applications received in 2019 increased by 66% as compared to that in 2018. The number of applications received in 2021 also increased by 32% as compared to 2020. The quality of applications was also significantly improved.

When implementing management measures, the NSAF Fund focuses on utilizing the roles of the proposing unit and experts responsible for projects. The *NSAF Fund*

Management Measures of the China Academy of Engineering Physics gives the unit proposing guidelines the responsibility to organize and follow up on project implementation throughout the project. Responsible Academy experts are assigned to key supporting projects, participating in the signing of agreements, project initiation, follow-up on project implementation (annual exchanges, topical meetings, interim reports, etc.), to ensure projects are planned and implemented that are focused on requirements, laying in a sound foundation for the eventual conversion of project achievements into applications.

4.4 Encourage in-depth collaboration, nurture outstanding talents

Basic research is not only the source power of units' innovative development, but is also an important channel to nurture innovative talents. Since the establishment of the NSAF Fund, the Joint Fund Office has highly valued nurturing young S&T talents in the process of fund management. It has proposed a series of relevant measures, achieving good results. Specifically, they include: (1) Asking the unit proposing guidelines to assign 1 to 2 youth researchers to participate in various project research and offering extra research funds to assure that this is the case; (2) upon completion of projects, the youth researchers will be asked to submit research reports according to given requirements and to deliver oral reports during pre-acceptance of project completion. Since 2000, over 1,000 youth researchers from CAEP have participated in NSAF Joint Fund projects. Youth researchers participated in project implementation in-depth, receiving guidance and training from experienced scholars from well-positioned teams in China. Some of these youth researchers have quickly grown into an important backbone for the main missions of CAEP. Many of these youth researchers of early projects have now taken on leadership roles in CAEP and have become academic leaders.

Meanwhile, the pulling force of the NSAF Fund has made CAEP researchers value basic exploration of the mechanics and laws of engineering technology missions more. From 2000 to 2020, the number of CAEP projects per year that have been subsidized by science funds (科学基金) has increased from 5 to 180, while the amount of funding has increased from RMB 1.9 million to over RMB 100 million, far exceeding annual rate of increase in the amount of funding supplied by science funds. The number of CAEP projects that obtained funding from science funds in the 10 years from 2011 to 2020 is around 5 times that from 2001 to 2010. These have significantly raised the academic quality and the scientific literacy of talent at CAEP in relevant fields.

4.5 Support resource sharing and promote collaboration for breakthroughs

Since 2019, incubation project reforms of the NSAF Fund have made large-scale scientific equipment available for external use for CAEP construction and operations. A

total of 47 incubation projects were funded, based on the four large-scale scientific devices/platforms previously made available for external use. Amongst these, the micro/nano process platform and the high average power terahertz free electron laser device (CTFEL) are newly constructed platforms that have expanded impacts in China through the NSAF Fund and have attracted 13 outstanding unit teams to become new users (92% of the total population). Since January 2020, overcoming difficulties brought by the pandemic, 52 online and offline project communication sessions and 22 joint experiments were held. Amongst these, the [China] Mianyang Research Reactor neutron scientific platform provided an accumulated number of 765 hours of radiation; the Xingguang-III Laser Facility started an accumulated number of 31 target-shooting experiments; and the CTFEL device and micro-nano process platform provided 180 and 980 hours of machine use, respectively. As CAEP contributes to national S&T innovation with national defense S&T capabilities, cutting-edge cross-disciplinary scientific issues are also providing an important pulling force for platforms to improve their capabilities quickly. In terms of management, by maintaining close communication with various device units, the NSAF Joint Fund Office ensures machine use hours and conditions of projects can satisfy demands for external projects. The Office has also built a collaborative sharing mechanism between units responsible for devices and units entrusted with projects, with methods such as agreements and project initiation meetings.

4.6 Summarize results systematically, focusing on achievement regression

NSAF Fund project management emphasizes studying “achievement regression” (“成果回归”) surrounding guidelines during and after completing a project. After an incubation project is completed, the unit proposing guidelines organizes seminars with the unit entrusted with the project in the form of “pre-acceptance of project completion” (“结题预验收”), to communicate the extent of problem-solving in-depth, and explore directions for future continuous collaborations. NSFC organizes acceptance meetings for key supporting projects, invites CAEP counterpart experts to attend, systematically organizes results, and evaluates benefits comprehensively. Macro-management of the NSAF Fund values systematic conclusions of different stages of work. Summing-up of the implementation of the Phase IV agreement begun before signing the Phase V agreement in 2018 has laid the foundation for signing and management reforms of the Phase V agreement. In December 2020, as the NSAF Fund celebrated its 20th anniversary of establishment, the NSFC Department of Mathematical Science and the CAEP Department of Science and Technology organized and held the NSAF Fund 20th Anniversary Exchange Meeting jointly, to summarize experiences, identify inadequacies, and propose suggestions for continuing optimization and reform. Xie Xincheng (谢心澄), deputy director of NSFC, commented

in the meeting, “As the joint fund project with the longest stable implementation time in China, the NSAF Fund has explored an effective and feasible model for gathering well-positioned basic scientific research forces across China to serve national security and major strategic requirements.”

5. Outlook for the Future

For 20 years, the NSAF Fund has been insisting on being requirement-driven and being problem-oriented, starting basic cutting-edge research surrounding national security requirements, tackling a series of core and key basic S&T issues, producing a series of important and original achievements, promoting the development of key disciplines and emerging cross-disciplines in the field of national security, exploring a new S&T collaboration and innovation model for military-civil technology with CAEP projects, and achieving excellent implementation results. Currently, while we are continuing to deepen management reform of the National Natural Science Fund of China, we have implemented a diverse input mechanism, and the various joint funds have further prospered and developed. Being oriented toward major strategic requirements of China, supporting the national economy, improving the well-being and health of the people, and promoting requirement-led basic scientific research collaboration and innovation are the common goals of the Joint Fund, and are also an important characteristic of the Joint Fund. The NSAF Fund insists on top-level design and managerial innovation under strategic guidance, exploring and practicing requirement-led management measures to make guidelines concise, strengthen guideline exchanges and promotion, promote coordination to tackle difficulties, share resources, receive feedback on achievements, and more, providing a feasible example and reference for other joint funds.

In the new era, as the international situation undergoes complex changes, under the guidance of goals set for national defense and military modernization, and the construction of an innovation-oriented country, as an important platform for basic scientific research collaboration and innovation in the national security field, the NSAF Fund hopes to offer some new substance and missions in the new era:

The first is to be future-oriented. Facing fields in which equipment requirements face key problems and in which there are potentially important academic value, we must launch original and groundbreaking basic research. We expect to form core capabilities within the next five to ten years, providing support for the upgrading and replacement of weapons and equipment and for continuous improvement of the advanced nature (先进性) of equipment..

The second is to be transformation-oriented. We will focus on strategic, forward-looking, disruptive research areas that can generate “revolutionary” breakthroughs,

and, coupling these with advanced deployments in currently weak/undeveloped fields, we will realize independent innovation and original innovation in national defense technology, and we will promote major and original innovation achievements in the national security field, seizing the decisive opportunity in international S&T and military competition.

The third is to be win-win-oriented. We will continue to promote the joint construction and sharing of military and civilian S&T resources. Utilizing the NSAF Fund as a platform, we will expand the opening up of large-scale CAEP scientific facilities and research platforms for external use, and we will gather new thinking and form new capabilities. We will continue to promote military-civil deep S&T fusion, support the establishment of mechanisms for open sharing of achievements, explore avenues for follow-up funding for outstanding products, and support the start of research on converting important achievements into applications, to achieve greater academic, military, and social benefits.