Preface

The Fifth Plenary Session of the Sixteenth CPC's National Congress proposed that strengthening indigenous innovation capability is the strategic foundation of scientific and technological development and the central issue in adjusting industrial structure and changing the ways of growth, and that scientific and technological development adheres to the principle of indigenous innovation, leaping forward in key areas, supporting the development and guiding the future, so as to provide strong support to the building of a well-off society in an all round way. As one of the main channels of funding basic research in China, the National Natural Science Foundation of China must carry out the spirit of the Fifth Plenary Session of the Sixteenth CPC's National Congress, stipulate and implement the Eleventh Five-Year Plan of Development, stimulate the healthy development of the science foundation cause, and promote the prosperity and development of Chinese basic research.

To develop basic research and strengthen original innovation is the strategic choice in increasing the indigenous innovation capability of China. Basic research takes as its basic mission the understanding of natural phenomena, the exploration of natural laws and the acquisition of new knowledge, new principles and new methods. It is the fountainhead of high-tech development, the cradle of innovative talents, the safeguard of sustainable development, the foundation of advanced culture construction, and the essential capability of a nation. Therefore, we must strengthen basic research and the development of cutting edge technology, greatly lift our capability of original innovation, integrated innovation and re-innovation on the basis of digesting the introduced technology. During the Eleventh Five-Year Plan period and even a longer period, China's development will rely, to a very large extent, on innovative achievements in basic research, and depend on outstanding talents that are fostered by research activities in basic science.

The work of NSFC must take incessant increasing original innovation of China as its strategic foundation. Since the implementation of the national science funding system, NSFC has been playing an important role in creating an innovation environment, fostering innovative ideas, gathering innovative talents, training creative research teams, guiding scientists to explore scientific frontiers and serving national goals, and has made significant contributions to promoting the development of basic research of China. NSFC has carried out the principle of "relying on experts, carrying forward democracy, selecting the best to fund and being fair and reasonable" in project evaluation, established a relatively complete management system of advisory, decision-making, implementation and supervision. NSFC's funding of research projects and fostering of talents is under continuous development and

improvement, and positive exploration and practice are made in order to promote basic research, especially fountainhead innovation.

In the Eleventh Five-Year Plan period, we should uphold Deng Xiaoping's theory and the important thought of "Three Represents" as the guiding principle, carry out the concept of scientific development in an all round way, accurately take its strategic position, strengthen the overall planning and coordination, implement our working guidelines, and bring into full play the role of science funding system in increasing the national innovation capabilities.

Accurately taking the strategic position of supporting basic research, insisting on free exploration and playing the guiding role means that we should stand firmly and unshakably to support basic research, emphasize fountainhead innovation, and provide continuous research results and reservations of talents for the development of science and technology, economy and society, that we should try hard to create a favorable environment for scientists to conduct free exploration in scientific research, and that we should strengthen the strategic guidance in line with the national strategic needs.

Strengthening the overall planning and coordination means that we should integrate the national strategic demand and the development of science, support research that is driven by the needs of the development of science itself, as well as research that is needed by the strategic demands of economic and social development of China, that we should make the overall planning and identify key issues so as to promote a balanced and coordinated development of different disciplines, and make key arrangement according to the strength and advantageous areas of China, that we should coordinate our funding on research projects, talent fostering and the construction of research environment, strengthen our support to research projects, focus on fostering talents of science and technology and promote the construction of research environment, that we should continue to improve, develop and carry forward the good tradition of NSFC, improve our funding structure, management system and operation mechanism, and further expand the function of science founding system, that we should seek more government financial input as well as attract investment from the society, continue to request budget increase from the Central government, make full use of the magnifying effect of NSFC funding, and actively attract private sectors to support basic research.

Carrying out the working principle of "respecting science, carrying forward democracy, advocating competition, promoting cooperation, encouraging innovation and playing the guiding role" means that we should uphold the concept of scientific development and correct understanding of performance and results, respect scientific laws and protect the creative spirit of scientists, that we should adhere to the principle of "relying on experts,

carrying forward democracy, selecting the best to fund and being fair and reasonable" in project evaluation, that we should improve our mechanism of equal competition and encourage scientists dare to be the first, that we should advocate cooperative spirits, support cooperative research and promote strategic cooperation, that we should construct the innovative environment and innovative culture, stimulate creative ideas and foster innovative talents, and that we should focus on frontiers of science and national strategic needs and bring the role of basic research in guiding the future development into full play.

The general goals of NSFC in the Eleventh Five-Year Plan period are as follows: to improve and develop the science founding system with Chinese characteristics, strive to create a good environment favoring fountainhead innovation, promote the balanced, coordinated and sustainable development of scientific disciplines, foster and create a number of outstanding scientists having international influence and innovative research groups at the frontiers of international science, raise the overall level of basic research and international competitiveness, strive to make breakthroughs in several important areas, and make contributions to furthering the cause of science, strengthening indigenous innovation capability and constructing an innovative China. In order to realize the above goals, NSFC will adopt in the Eleventh Five-Year Plan period the following four strategies:

The first is fountainhead innovation strategy. We should focus on frontiers of science and national strategic needs, improve scientific disciplinary structure, promote the intercrossing of disciplines, strengthen the planning in key scientific areas ahead of time, foster original innovation, promote the integrated innovation, construct a knowledge platform supporting science and technology, economy and social development.

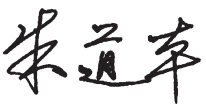
The second is scientific and technological talent strategy. We should adhere to the people-oriented policy, promote the integration of basic research and education, strengthen the fostering of young talents in science and technology, gather talent resources in China and abroad, improve NSFC funding system of fostering talents, promote the construction of a contingent of talents in science and technology and innovation capabilities.

The third is innovative environment strategy. We should try to improve the public understanding of and support to basic research, adhere to scientific laws, improve NSFC evaluation system, create a culture stimulating innovation, actively conduct substantive international cooperation and exchange, strengthen strategic cooperation with relevant government ministries and enterprises, promote the sharing of science and technology resources and strengthen our support on facilities for making indigenous innovation.

The fourth is the strategy for excellent management. We should improve our management

system and operation mechanism, strengthen the construction of management team, bring into play the role of the institutions whose scientists undertake NSFC projects, increase our management capability in an all round way, and maintain the funding efficiency of the national natural science fund.

Looking into the future, we should put promoting the indigenous innovation of science and technology on a prominent position in NSFC's work, seize the opportunity, update our understanding of development, make innovative changes in the modes of development, improve the quality of development, and make duly and more contributions to raising the national capability of indigenous innovation in science and technology in an all round way, to the construction of a innovative China, and to realizing in an all round way the goals of social and economic development in the Eleventh Five-Year Plan period.



Zhu Daoben
Vice President of NSFC
November 20, 2005

Foreword

The National Natural Science Fund, a primary channel in China funding basic research, mainly supports scientists in Chinese universities and research institutions having good research capabilities and potentials. In the past 20 years, through the management of government investment in the National Natural Science Fund, the National Natural Science Foundation of China (NSFC) has supported over 100,000 projects of various kinds, hence playing an irreplaceable role in the development of basic research in China. According to the characteristics of basic research and integrated with the strategic guidelines of national development of science and technology in the new period, NSFC takes "supporting basic research, adhering to free exploration and playing the guiding role" as its strategic task, and by continuous administrative reform and exploration, has constructed a funding system favoring fountainhead innovation. NSFC encourages fountainhead innovation and supports the intercrossing and infiltration of different academic ideas.

According to the types of funding, the programs of the National Natural Science Fund consist of the following types: General Program, Key Program, Major Program, Major Research Plan, National Science Fund for Distinguished Young Scholars, Joint Research Fund for Overseas Chinese Young Scholars, Joint Research Fund for Hong Kong and Macao Young Scholars, Science Fund for Creative Research Groups, Special Funds, Program for Joint Funds, Funds for International Cooperation and Exchange, etc. All of these categories have their preferential focuses and are complementary to each other, which form the current complete system of the National Natural Science Fund.

In the concentrated application acceptance period in 2005, NSFC received a total of 49, 326 applications for General Program projects, which is 24.36% more than that in the previous year. Among them, 9,089 were approved, which was 17.87% more than that in the previous year. The average funding intensity was 247,800 yuan per project, which is 30,600 yuan higher than the 217,200 yuan in the previous year. Excluding the short-term projects, such as those lasting for 1 or 2 years, the average funding intensity was 261,800 yuan per project for the 3-year projects. This is a large increase over the previous year. Applications for Key Program projects amounted to 1,330, among which 290 were funded and the average funding intensity is 1,592,000 yuan per project.

To help scientists learn in time the funding policies of NSFC in 2006 and select the correct type of programs to apply for funds to conduct original creative research in basic sciences, the *Guide to Programs of the National Natural Science Fund: 2006* (hereafter referred to as *Guide to Programs*) is published.

The *Guide to Programs* introduces various types of project applications to be accepted in the one-time acceptance period according to program types. Meanwhile, when describing General Program, a general introduction of each science department and special notices in that department are also listed, which should be read carefully by the applicants.

According to the problems occurred in project application, acceptance and evaluation in the recent two years, applicants and their home institutions should pay attention to the following points when applying for projects in 2006.

Before writing application, please read carefully the *Guide to Programs* and other documents related to NSFC projects, such as policies, procedures, notifications and announcement. When writing application, please fill in the relevant contents exactly as requested so as to avoid being rejected in the formality review period due to not understanding the relevant regulations of NSFC. The home institutions should check carefully on the truthfulness of the applications and bear responsibility on the qualification of the applicants. The following requirements in particular should be noted:

1. When writing proposals, one must carefully and correctly choose the application code, funding categories, notes to sub-categories and additional notes. Failing to do so will result in being eliminated in the preliminary review;
2. If there is a collaborator from another institution other than the home institution in the research team list, it will be treated as having a collaborative institution, so the official seal of the other institution must be affixed to the application at the appropriate page;
3. If the applicant is a Ph.D. student, the supervisor must sign to show consent on the application materials;
4. The applicant and members of the research team must sign on the application form;
5. Applicants who have undertaken projects of the Young Scientists Fund before are not allowed to apply for it again.

Any of the above mentioned problems appearing in the application will result in being eliminated in the preliminary review, hence not being able to enter into the second round of evaluation process.

When writing application, applicants should be honest and precise. Exaggeration, untrue and inaccurate statements must be cleared out from the application. NSFC is always fighting against falsification.

Research proposed should contain substantial ideas or thoughts of original innovation.

Problems stated and clear procedures of proposed solution should be based on the extensive studies of the existing academic documents and accumulated knowledge of previous research. General and empty statements in research description should be avoided. The background of application for applied research must be addressed clearly.

When applying for Key Program projects, applicants should understand clearly the requirements stated in the *Guide to Programs*. Please pay attention to proposing concise contents and directions of research. They should try to avoid too big and too generalized research topics, and those lacking of in-depth studies. For Key Program projects that are categorized by "area", one should distinguish the name of the area and the title of the project to be proposed. The project title should be chosen according to research contents, not research area. Meanwhile, one should note that the project tile should match the research contents. Do not attempt to cover everything mentioned in this area.

When applying for projects of the Joint Funds, please pay attention to the protection of intellectual property rights and other special requirements.

Applicants should observe the time requirement. Applications should be submitted through their host institutions. NSFC does not handle applications submitted by individuals.

Those applying for the first time are advised to consult their institution managers or others who have experiences before writing applications.

The host institutions of the applicants should strictly observe the requirements indicated in the *Guide to Programs* and other regulations, rules and notifications and announcements of NSFC, organize, provide guidance and supervise applications by scientists of their institutions. In the recent two years, it has been found that one person submitted applications in different institutions at the same time. It is hoped that applicants and host institutions pay attention to this. This phenomenon should be strictly eliminated.

In addition, due to the time delay in the publication, some information on the programs may fail to be included in the *Guide to Programs*, and will be announced separately in due time on NSFC website or in other forms. Please keep an eye on the documents, announcements, journals and booklets on other NSFC projects published by NSFC. In particular, please pay attention to NSFC website (http://www.nsfc.gov.cn). Some important guides to programs will also be published in national scientific journals and newspapers.

During the process of application acceptance and assessment and project management,

NSFC will adhere to the principle of "relying on experts, carrying forward democracy, selecting the best to fund and being fair and reasonable" at all times. NSFC adopts the mechanism of "fair competition, being scientific and democratic and encouraging innovation", observes pertinent regulations on the conflict of interests and protection of secrecy, and accepts the supervision from the scientific community and the public. NSFC welcomes scientists throughout the country to propose research projects of high level and apply for the National Natural Science Fund.

Editorial Board of *Guide to Programs of the National Natural Science Fund: 2006*

November 15, 2005

Department of Mathematical and Physical Sciences

Mathematical and physical sciences are basic disciplines of natural science, and the precursor and basis for the development of contemporary science. The development of mathematics and physical sciences also supplies theories, methods and means to the development of other disciplines. Research findings in mathematics and physics play a key role in promoting the progress of both basic and applied scientific disciplines. Therefore, the Department of Mathematical and Physical Sciences has always paid great attention to basic research, and will continue to increase its support to basic research that takes advancing the disciplinary development, promoting originality and training of talented researchers as its primary goals. The Department will give sustained funding so as to stabilize a keen-witted and high standard research team for every discipline covered by the Department, and to boost the development of mathematics and physics in a persistent, stable and harmonious way so that they can gradually reach the internationally advanced level. The Department will also give timely funding to applied basic research projects that have clear prospects of application and meet the needs of national long-term development.

Mathematical and physical sciences have extensive interactions with other sciences, e.g., mathematics with information science, life science and management science, physics with materials science, life science, information science and chemistry, astronomy with earth science, and mechanics with engineering science and earth science. As a result, a series of interdisciplinary and cross-boundary disciplines and new research areas have emerged, and at the same time research objects and areas in mathematical and physical sciences are also expanding. In 2006, the Department will continue to support interdisciplinary projects both within the Department and jointly with other departments of NSFC.

International cooperation and exchange play an important role in promoting the development of mathematical and physical sciences. To promote international cooperation and exchange in mathematical and physical sciences and to encourage researchers to participate in international competition, the Department will, in accordance with the plan of the Bureau of International Cooperation, continue to support a number of high level international cooperative projects in 2006, including some major joint research projects. Interested scientists with cooperation background and qualification may submit proposals according to the requirements in time. The Department will hold panel meetings and organize interviews with qualified applicants according to the results of peer review.

In accordance with the strategic needs of the development of mathematical and physical sciences and the overall plan of project funding, the Department has taken some measures in project funding and has strengthened macro guidance in recent years. In 2006, the Department will continue to pay attention to the following aspects:

1. To increase the support on fostering outstanding young talents. In 2005, the percentage of principal investigators under the age of 45 in General Program projects reached 45.7%. In 2006, the scope of Young Scientists Fund projects will continue to expand, so as to let more young scientists get funding to conduct independent research. In the Free Application projects, more emphasis lies on innovative research and development of disciplines.
2. To increase both the funding intensity per project and the rate of success in the Fund for Less Developed Regions. In order to support the national strategy of developing the western part of China, the Department has, since 2001, adopted special policies in favor of applications for General Program projects from scientists in the west, and at the same time started increasing gradually the budget for the Fund for Less Developed Regions.
3. For General Program projects, the Department will adopt various means of funding to meet the research requirements. For the studies on experimental methods and techniques having innovative ideas, the Department will give funding according to the actual needs, which can be up to 500,000 to 600,000 yuan. Applicants should pay attention to this policy.
4. In the Key Program category, in order to encourage innovation and promote projects having innovative ideas, the published project number or research directions will be more than that to be actually funded.

Funding for Free Application Projects in the Department of Mathematical and Physical Sciences in the Recent Two Years

Scientific Division		FY 2004			FY 2005		
		Projects granted		Success Rate (%)	Projects granted		Success Rate (%)
		Number	Funds (10,000 yuan)		Number	Funds (10,000 yuan)	
Division of Mathematics	Basic mathematics	113+10*	1,975	32.6	131+11*	2,952	34.6
	Applied mathematics and computational mathematics	84+5*	1,465	31.4	102+4*	2,199	31.9
Division of Mechanics	General mechanics	26+3*	648	25.7	27+2*	800	25.2
	Solid mechanics	81+8*	2,301	24.3	103+8*	3,406	24.5
	Fluid mechanics	37+3*	989	26.5	44+4*	1,340	26.8
	Interdisciplinary mechanics	25+1*	671	27.1	31+1*	1,016	27.1
	Joint Fund of Aeronautics	19	380	21.8	21	400	21.9
Division of Astronomy	Astrophysics	31+2*	1,137	33.3	40+4*	1,340	34.1
	Astronomical measurements and celestial mechanics	3	90	21.4	10+1*	321	26.8

(*Continue*)

Scientific Division		FY 2004			FY 2005		
		Projects granted		Success Rate (%)	Projects granted		Success Rate (%)
		Number	Funds (10,000 yuan)		Number	Funds (10,000 yuan)	
Division I of Physics	Condensed matter I physics	25+2*	709	23.7	30+3*	918	26.2
	Condensed matter II physics	67+3*	1,861	27.7	73+3*	2,291	26.8
	Atomic and molecular physics	23+2*	648	28.1	28+4*	908	30.8
	Optics	35+3*	1,000	26.0	46+3*	1,431	26.8
	Acoustics	20+2*	599	29.7	23+3*	782	29.2
Division II of Physics	Basic physics	14+4*	336	24.3	21+1*	578	24.7
	Particle physics and field theory	25+1*	557	38.8	22+2*	638	45.3
	Nuclear physics and nuclear technology and application	61+6*	1,889	32.2	70+4*	2,327	31.6
	Particle physics and experimental facilities for nuclear physics	14+1*	451	23.1	25+3*	858	30.1
	Plasma physics	30+1*	886	33.3	27+2*	867	31.9
	Joint Fund	35	991	38.5	41	1,370	47.7
Total		768+57*	19,583	28.7	915+63*	26,742	29.6
Average funding per project		23.6 (24.6**)			27.3 (28.3**)		

Notes: * Projects of Small Fund for Exploratory Studies.

** Not including projects of Small Fund for Exploratory Studies.

5. To strengthen the macro planning and adjustment and give preferential support to special areas. In 2006, the following 10 areas that are specially emphasized will continue to receive preferential support.

1) Atomic and molecular physics, and basis of precision measurements, which is relatively weak in China and needs further development;
2) Applications of mathematics in other disciplines, and interdisciplinary problems related to information sciences;
3) Interdisciplinary research among the four major disciplines within the Department, namely, mathematics, mechanics, astronomy and physics;

4) Novel research and development of experimental methods and techniques;
5) Pre-research on scientific goals of large-scale national engineering projects;
6) Projects needed by disciplinary development or layout;
7) Interdisciplinary research within the Department and with other department(s), and within a discipline, such as different areas within mathematics;
8) Synchronized radiation technology and its application;
9) Radiation protection and radiation chemistry;
10) Non-consensus projects and projects for less developed regions.

NSFC and the Chinese Academy of Engineering Physics established a joint fund in 2000 in order to strengthen the role of basic research in promoting the development of new research directions and new areas and in providing new concepts and new methods for national security and high-tech research. In 2005, the Joint Fund supported 41 projects with a total funding of 13.70 million yuan in the fields of mathematics, physics, information, materials, chemistry, etc. The Department is responsible for proposal acceptance and evaluation. In 2006, proposals will continue to be accepted. More information can be found in the section of "Joint Fund of NSAF".

In 2006, the Department will continue to support interdisciplinary projects between information and mathematics. Please see relevant sections in the Department of Information Sciences.

Division of Mathematics

Modern mathematics tends to develop towards internal unity among its various branches, and has more and more important potentials of application in various other research areas. According to the characteristics and trend of development of modern mathematics, the Division encourages original research in important issues and open problems in mathematics, and the development of new mathematical methods, models and theories. Interdisciplinary research among different branches of mathematics and application of mathematics in other disciplines are encouraged. This requires that applicants and their research teams have sound basis and capability of research. Research plan should be based on the deep understanding of the statues quo of research, main problems and relevant research methods and available means. Through funding of projects, outstanding talents are to be fostered and research adjusted to the international trend, so as to lay a solid foundation for reaching the international level of mathematical research.

The following fields will be supported:

Mathematical and physical logic and mathematical bases, number theory, algebra, geometry, topology, theory of functions, functional analysis, modern mathematical physics, ordinary differential equations and dynamical systems, partial differential equations, probability theory and mathematical and physical statistics, control theory, discrete mathematics,

computational mathematics, large scale computation of scientific and engineering problems, mathematical physics, mathematical theory and methods in operations research, other disciplinary studies with mathematics, and new mathematical models and algorithms for practical problems.

The Free Application program supports research teams having strong research capabilities and aiming at hot spots and important issues in international mathematical research. The Young Scientists Fund is to support young applicants to conduct independent studies on topics of their own interests and having mathematical significance, and, through funding of projects, foster talented mathematicians. The Fund for Less Developed Regions is aimed at helping those regions where mathematical research is relatively weak, creating a good environment for mathematical research and building a research team of reasonable scale, so as to improve gradually the research level and cultivate talented mathematicians for the development of local science and technology. In order to attain a reasonable distribution of projects and appropriate funding scope, support will be strictly controlled for proposals independently submitted by individuals or several proposals of the same research orientation from the same institution and applicants having on-going projects.

For basic mathematics, the funding is aimed at maintaining research directions where China is advanced and research areas where China has comparatively large-scale research, promoting the development of research areas that are within the international mathematical research mainstream but are still relatively weak in China, and encouraging interdisciplinary research among branches of mathematics. The funding for applied mathematics and computational mathematics encourages topics having strong practical background and application. Research proposals should pay attention to life science, information science, environmental science, energy science and other disciplines closely related to the economic and social development, have good understanding of important scientific issues in these areas, and find appropriate topics intercrossing with these areas so as to promote the development of applied mathematics.

Division of Mechanics

The Division mainly supports research in the areas of dynamics and control (general mechanics), solid mechanics, fluid mechanics and interdisciplinary mechanics. The Division supports, on the one hand, basic research projects that are on the frontiers of international research and have creative academic ideas, and on the other hand, those applied basic research projects that are closely related to engineering application for the development of technology. The Division encourages experimental research using experimental facilities and key labs in China and interdisciplinary research conducted by scientists from relevant disciplines. The Division promotes international collaboration with substantive contents using advanced experimental and computational facilities in foreign countries.

Research in dynamics and control (general mechanics) should address issues of complex

dynamical systems and control, pay attention to breakthroughs in the theory and methods of dynamics and dynamical modeling of problems involving the coupling of solid, flexible, fluid and control problems, and problems in micro system dynamics. The Division encourages studies of key issues of dynamics, vibration and control in China's major engineering projects, such as aeronautics, space exploration, energy and transportation, etc. Research should properly combine theoretical analysis, numerical computation and experiments so as to promote creative studies that explore new phenomena, new laws and new methods.

Applications in the area of solid mechanics should give more considerations on intercrossing with other basic disciplines and engineering, strengthen research on micro and nano scale mechanical behavior and simulation, constitutive theory of materials at macro and micro scales, damage evolution process and failure mechanism, mechanical behavior of new materials, performance control and optimal design, structural analysis and optimization, and safety evaluations, damage of rock and soil materials, prevention of geological disasters, etc.

Applications in fluid mechanics should strive for breakthroughs in understanding the mechanism and governing principles of turbulence formation. In addition, research on unsteady, non-continuous, non-equilibrium, highly nonlinear, multi-scale, multi-field coupling and anisotropic flow phenomena will be strengthened. Whereas fluid mechanical problems in aerospace, navigation, weaponry, hydrology and chemical engineering are studied, further efforts should be made on strengthening research on fluid mechanical issues in energy, environment, materials science and other high-tech and advanced technology areas.

Research in interdisciplinary mechanics should pay attention to mechanical problems in real environment, especially the environment in western regions of China. Research on explosive mechanics should be strengthened and study of biomechanics will continue to receive preferential support.

In 2006, the Division will continue to give special support to experimental studies, and encourage in particular novel research on instrument development and innovation, and new experimental methods and technology. The Division will continue to encourage the integration of mechanics with chemistry, information science, life science, engineering science and materials science. The Division welcomes basic research topics of exploratory nature that are resulted from issues related to the national security and national economy. Young scientists are encouraged to apply for the National Science Fund for Distinguished Scholars.

In 2006, in order to strengthen the role of Key Program projects in the overall planning of disciplinary development of mechanics, and increase the competitiveness of project application, the Division will determine Key Program areas based on the principle of supporting basic theory, paying attention to frontier areas in a discipline, promoting the

intercrossing of disciplines, strengthen the guidance according to demands, and also priority areas and the latest development in a discipline.

Division of Astronomy

The Division of Astronomy mainly supports research in astrophysics, basic astronomy and astronomical instruments and technology. In accordance with the trend of astronomical development in the world and the present situation in China, the Division supports research proposals with emphasis on the development of technology and instrumentation. Studies based on existing observation apparatus or facilities to be built soon in China will be encouraged. The Division promotes the combination of innovative ideas, observation and theories, and studies on new technologies and methodologies used in astronomy, especially studies which are closely related to the large sky area multi-objects fiber spectrographic telescope (LAMOST), a mega-science project under construction in China. Interdisciplinary research is strongly encouraged so that research groups having special characteristics and influence in international scientific communities can be gradually established. International cooperation and exchange, particularly those using large and advanced facilities abroad for observation and research, will be given great attention and financial support.

Of the supported General Program projects in recent years, studies in astrophysics become the majority, representing about 79% of the total projects funded by the Division. In 2005, projects for galaxies and cosmology, stellar physics, solar physics, astrometry and celestial mechanics and astronomical technology and methods (including the history of astronomy) represented 35.2%, 33.3%, 11.1% and 18.5% of the total projects, respectively. Projects funded in astrophysics accounted for 79.6% of the total. Young researchers have become the main forces in astronomical research and about 63.5% of total researchers are young people under the age of 40.

In 2006, in addition to continuing strengthening support on projects integrating theory and observation and young scientists, emphasis will be given to interdisciplinary research with physics, space science, etc. Compared with the development in the world, research on planetary physics is weak in China, and should therefore be enhanced immediately. On the basis of funding the best, the Division encourages research on particle cosmology, celestial bodies in the solar system, structure and dynamics of ordinary galaxies, infrared astronomy, space astronomical measurement, etc. Research in astrometry, celestial mechanics, astronomical technology and methods and small astronomical research units will be given preferential support.

In the next few years, the Division plans to give special support to pre-research around scientific objectives of LAMOST, and conceptual studies on new technologies that are urgently needed for large-scale telescope and space exploration. In 2006, in addition to continue support on research in dark matter, dark energy, formation and evolution of galaxies, structure and evolution of the Galaxy, etc., and because LAMOST will soon

become a formal participant in the second phase of SDSS, the pre-research on scientific goals of LAMOST using SDSS observation data will become the main area of support. Meanwhile, pre-research on the evolution of stars from several hundred samples obtained during the adjusting and pre-observation period of LAMOST, structure and low and middle resolution spectrum observation of the structure and various special celestial bodies in the Galaxy will be supported.

The amount of funding is from 300,000 to 600,000 yuan per project. Innovative research on manufacturing and refurbishing instruments and facilities having clear physical ideas will be funded, with funding from 300,000 to 600,000 yuan per project.

Division I of Physics

The Division I of Physics supports research in condensed matter physics, optics, atomic and molecular physics and acoustics, and new research areas formed by the intercrossing between these four disciplines and other disciplines. Support on new interdisciplinary areas emphasizes more on exploratory and basic studies in physics.

In condensed matter physics, the Division pays attention to singular quantum phenomenon in electron related systems, quantum phenomena and quantum effects in various low dimensional and small-scale systems or devices that break the classical physical limit, and physical theory and experimental methods related to life science. Encouraged areas of research include basic physical problems in soft matters, structural and physical properties of surface, interface and membrane, physical properties of nano systems, advanced technologies and methods of device physics and nano structures, physical problems in the formation and preparation of new functional materials, and interdisciplinary problems related to condensed matter physics. Emphasis is given to fundamental physical problems urgently needed to be solved in the development of technologies serving major national needs.

Following the development of cold atom, cold molecule and ion catching technology, and the generation of ultra-short pulse light source, atomic physics is now facing challenges of many newly formed research topics. While continuing to select the best projects to support in the areas of atomic, molecular and cluster structures and dynamical process, the Division encourages research in cold atomic and molecular physics and application, complex interactions of atomic and molecular systems, principles and key technologies of atomic and molecular precision spectrum and precision measurement, and computer simulation of atomic and molecular plasma in materials, energy, life, environment and space sciences. In order to promote atomic and molecular research, the discretionary budget will be used first on atomic and molecular physics and nuclear physics, optical physics, condensed matter physics and interdisciplinary projects with chemistry and life sciences, so as to expand gradually the research fields of atomic and molecular physics, and to meet the needs of the development of modern disciplines.

Studies in optical physics are focused on basic properties of optical radiation, basic laws of light propagation, interaction of light and matter, etc. The Division encourages studies on physical problems in ultra fast and extremely strong light conditions, micro and nano optics, new quantum frequency markers, optical frequency markers and quantum information, propagation process of light in new media and its characteristics, high resolution, high sensitivity and high precision laser spectrum and its application, and optical problems in energy, information, life and space sciences. In addition, optical electronics as well as physical issues in optical electronics are also important research areas. It is hoped that proposals will closely combine optics with atomic and molecular physics so as to learn from each other.

Much of the research in China is in application field, so the basic aspect should be strengthened. Therefore, the Division encourages fundamental acoustic research related to major needs of the national development. It is hoped that more projects with innovative ideas will appear in areas of hydro-acoustics and marine acoustics, ultrasonic and acoustic effect, structural acoustics and vibrations, acoustic materials, acoustic information processing, noise and control, acoustic problems in information technology, etc.

Division II of Physics

The Division II of Physics mainly supports research in the areas of fundamental physics, particle physics, nuclear physics, nuclear technology and application, accelerator physics and detectors, plasma physics and synchronized radiation methods.

Support in fundamental physics emphasizes on original studies in theoretical physics and interdisciplinary research between theoretical physics and other disciplines. Current hotspots should be noted. Research should be coordinated with the Major Research Plan project "Frontier Issues in Theoretical Physics and Related Disciplines". Special attention should be paid to important theoretical physical problems that are closely related to experimental studies and raised from scientific experiments and from interdisciplinary considerations.

In particle physics and nuclear physics, the Division will focus its support on the research of physics issues related to large-scale experimental facilities that are in operation or those to be completed soon, and in particular, the combination of theoretical and experimental studies. In the next few years, a number of large-scale experimental facilities of international cooperation will be in operation successively. In conjunction with international cooperative projects centered on large-scale equipment, the Division will select some proposals of physics in relation to this and give preferential support. The funding will be used to guide research towards the understanding of important physical rules related to the latest experimental results, such as the theory and experiments of phenomenology in particle physics and interdisciplinary research of nuclear physics under extreme conditions with nuclear astrophysics and other disciplines.

In nuclear technology, accelerator and detector, low-temperature plasma and synchronized radiation, it is hoped that fundamental problems can be drawn from the national demand and through intercrossing with other disciplines, which have important prospects of application and at the same time can facilitate deeper understanding of the physical laws underlying the development of the discipline. Special emphasis is laid on innovative ideas in methodology and intercrossing with other disciplines. In addition, the exploration of mechanisms and rules governing the interaction of matter with instantaneous, high energy, high power and strong field radiation (ion, neutron and electromagnetic fields) may become hotspots in this area. In accordance with this, in accelerator and detector and plasma research, nanometer micro-beam, high power ion beam, strong current accelerators, plasma radiation source and all other advanced radiation sources of nuclear technology will receive more attention.

Applications in nuclear fusion and plasma physics should pay more attention to the exploration of new diagnostic means related to large facilities, which are in operation at present or will be built soon. In particular, basic research on advanced magnetic confinement fusion and new approaches to inertial confinement fusion and related fundamental physical problems, and key physical problems in fusion studies and computer simulation of various kinds of plasma will be stressed.

In order to guarantee more efficient use of limited funds and research in each field in a benign cycle of sustainable development, the Division encourages studies of independent innovative methods of high resolution diagnosis and detection and important experimental studies for the development of accelerators and detectors, including the development of experimental facilities, detection and diagnosis devices. The amount of funding will be increased according to actual need. Funding priority will be given to projects having more young scientists in the research team. Attention will be given to projects that have national needs and basic nature and have good record in previous studies. Meanwhile interdisciplinary research will also be noted.

Deartment of Chemical Science

The Department of Chemical Sciences involves two first-grade disciplines (chemistry and chemical engineering) and is divided into the following five divisions (including seven disciplines): Division I of Chemical Science (inorganic chemistry and analytical chemistry), Division II of Chemical Science (organic chemistry), Division III of Chemical Science (physical chemistry), Division IV of Chemical Science (polymer science and environmental chemistry) and Division V of Chemical Science (chemical engineering). Chemistry is the science that studies the change of matters and chemical reactions, and is a core science which not only maintains close ties but also intercrosses and permeates with information science, life science, materials science, environmental science, energy science, earth science, space science and nuclear science. Chemical engineering is to realize the transfer and conversion of matters and energies by making use of the principles of basic disciplines and to solve scientific problems in developing methods and ways for large-scaled production of chemical materials and products.

The Department will take as its mission the acceleration of the development of chemistry and chemical engineering and the strengthening of original innovation in basic research so as to bring into full play their roles as core science in multidisciplinary research. It will take as its goals the promotion of the overall quality and international status of Chinese basic research of chemical science and the fostering of creative talents and groups engaged in chemical research with international influence. It will focus on the research of Pan Molecules to find more types and patterns of molecules at different levels and to control the chemical reactions and processes. It encourages multi-level and multi-scale researches that take atoms, molecules, molecular aggregation and condensed state as well as those of complex systems as their objects of study. Centering on major scientific issues closely related to the national economic and social development, national security and sustainable development and combining with research conducted in the fields of life, materials, energy, information, resources environmental sciences and human health, it is to show and bring into play the role of chemistry and chemical engineering. As for the methods of study, it stresses the combination of microscopic and macroscopic researches, and that of static and dynamic states as well as theoretical researches and the development of new experimental methods and analytical technologies. It also encourages the absorption of latest theories, technologies and achievements in other disciplines, and proposes fountainhead innovation and interdisciplinary studies aimed at the frontiers of research to help the development of chemistry and chemical engineering.

In the Eleventh Five-Year Plan period, China should strive hard to hold a major position in the international frontiers of chemical science. The Department energetically promotes creative researches of high academic standards in the fields of cutting edge science, and encourages and supports research subjects of disciplinary intercrossing and integration. It implements the policy of preferentially supporting proposals that belong to the interdisciplinary subjects, and takes effective measures to give protection and support to original creative researches with high risk. For the projects of Young Scientists Fund, the

stress is to support projects with new ideas and to lighten the weight of research accumulation in order to help young talents to show themselves.

Funding for Free Application Projects in Recent Years

Unit: 10, 000 yuan

Scientific Division		FY 2004			FY 2005		
		Projects granted		Rate(%)	Projects granted		Rate(%)
		Number	Funds	***	Number	Funds	***
Chemistry I	Inorganic chemistry	81+8*	1,986	21.70	105+11	2,818	22.97
	Analytical chemistry	82+7*	1,960	23.24	96+10	2,659	22.55
Chemistry II	Organic chemistry	140+10*	3,328	24.31	171+16	4,766	24.90
Chemistry III	Physical chemistry	135+11*	3,283	26.26	165+17	4,465	26.57
Chemistry IV	Polymer science	87+8*	2,156	23.69	108+10	2,904	27.96
	Environmental chemistry	72+6*	1,757	17.97	89+10	2,452	19.11
Chemistry V	Chemical engineering	126+10*	3,036	18.38	161+15	4,267	18.92
Total		723+60*	17,506	22.11	895+89*	24,331	22.99
Average amount per project		22.36 (23.56**)			24.72 (26.39**)		

Notes: * The number of projects of Small Fund for Exploratory Studies.

** The average funding of 3-year projects of General Program (not including projects of Small Fund for Exploratory Studies).

*** The rate calculated on the basis of all projects (including projects of Small Fund for Exploratory Studies).

In FY 2006, the number of projects to be supported is about the same as that in FY 2005.

Division I of Chemical Science

Research fields that accept proposals in the Division are in two disciplines: inorganic chemistry and analytical chemistry.

Inorganic Chemistry

The current trend of the development of inorganic chemistry is: 1) the intercrossing and fusion of inorganic chemistry with materials science and life science are more evident. In the studies of synthesis and preparation, painstaking efforts should be made on developing

new synthetic methods and ways; 2) the concept of molecular design and crystal engineering is stressed to promote research on the synthesis of new compounds and studies of aggregate state of special matters; 3) studies on the composition, assembly, hybridization and tailoring of inorganic functional materials are emphasized; 4) research on the relations between structure and property of functional inorganic matters are strengthened and the theoretical study on mesoscopic and microscopic structures should be explored; 5) in-depth interdisciplinary research on inorganic chemistry and life science is intensified and the chemical study of biological effects of inorganic elements is highlighted; 6) basic research on new types of metal combined bio-macromolecules, inorganic bionic processes and bioinorganic chemistry beyond molecular level is actively developed.

In the past few years, among the proposals for General Program projects in inorganic chemistry, the number of proposals for coordinated chemistry and molecular-based materials chemistry represents a large proportion, which is in line with the development trend of the discipline and is one of the key funding areas of the Division. Proposals related to new type inorganic compounds and new synthetic methods, reaction processes and relations between structures and properties are on the low side, so is the number for bioinorganic chemistry and radiochemistry, which should be enhanced. There is no lack of proposals with new ideas, but those with original creativity are still rare. In general, basic theoretical research should be strengthened, the consciousness of exploration and creativity should be enhanced and the depth of research on inorganic chemistry should be increased.

Research areas encouraged are synthesis, reaction, structures and properties of new inorganic compounds, design and synthesis of new inorganic materials, theoretical inorganic chemistry, chemical basis of informational opto-electronic materials, basis of nano-chemistry, new types of functional coordinated complexes, super-molecular chemistry and coordinated polymer chemistry, chemistry of inorganic biological effects, inorganic bionics and metal combined bio-macromolecules, basis of new type inorganic pharmacochemistry and radiochemistry, and research areas intercrossing with other related disciplines.

Analytical Chemistry

The development of life science, materials science, environmental science, postgenomic era and bio-informatics poses higher requests to analytical chemistry and also provides opportunities for its development. The research areas in analytical chemistry are very wide, which include not only inorganic analysis, organic analysis, biochemical analysis, environmental analysis, process analysis, pharmaceutical analysis, cellular analysis, immunization analysis, food analysis, clinical analysis, analysis of traditional Chinese medical herbs, spectroscopy analysis, characterization and analysis of materials, analytical chemistry of nano-particles and chips, but also chemo-informatics, bio-informatics, instrument development, quality control and surface and interfacial analysis, as well as basic research on new principles, methods, techniques, instruments and key devices related to those areas.

In recent years, both the number of projects and funding intensity in the discipline are increased by a big margin. Viewing the situation of application and support, the followings are the development tendencies: 1) to highlight the research of methodology and the integration of methods to address issues at deep levels; 2) to combine closely with the national security, needs and economical development; 3) to strengthen and pay attention to the research on new techniques and methods of detection and diagnosis related to human health; 4) to strengthen and emphasize the development of instruments, including not only the development of whole set instruments, but also the improvement of instruments, the escalation of performance, the development of accessories and parts and so on; 5) to stress the studies of mutual action, signal transformation and action mechanism of related materials; 6) to bring into full play the major role of analytical chemistry in the studies of all types of biomics and system biology; 7) to pay attention to the development of pre-treatment technologies of samples.

Research areas encouraged include new technologies and methods of analysis in genomics, proteomics, metabolismics and metallomics, analyses of monomolecular and unicellular as well as real-time and quantitative expression of life information, pre-treatment technologies of samples, interaction between bio-molecules, analysis of traditional Chinese herbs and screening of active compositions, food analysis and food safety, various kinds of probe and sensor techniques, new techniques and methods of pre-warning and diagnosis of diseases, analysis of spectroscopes and mass spectra, analysis of surface, micro-area, and morphology, analysis of in site image formation, analytical chemistry of processes, environment, nano-particles and chips, chemo-informatics, instrument development (including accessories and minimization of instrument), analytical methods and techniques of aviation and space survey, analytical methods and techniques involved in the national prestige, national benefit, national security and suddenly occurred events.

Division II of Chemical Science

Research fields funded by the Division include organic chemistry and chemical biology. The research contents of chemical biology are listed in the guide of other related divisions.

Organic chemistry is a branch of science, which studies the sources and components, synthesis and preparation, structures and properties, reaction and conversion, as well as functions and reactive mechanism of organic compounds. New theories, methods and reactions in organic chemistry have promoted not only the development of chemical science, but also its intercrossing with life science, materials science and environmental science in a greater extent, which has further pushed forward the progress of organic chemistry. At present, its characteristics are as follows: 1) the concept on organic molecular design, recognition and self-assembly is affecting many fields of natural science; 2) new research methods and means are provided for studying and recognizing complex phenomena in life systems through the intercrossing between organic chemistry and life sciences; 3) the discovery, manufacture and utilization of new functional organic matters have been making significant contributions to the mankind for meeting its needs; 4) selective reaction, catalytic

asymmetric synthesis in particular, has become a hot issue and cutting edge in the research on organic synthesis; 5) green chemistry is turning into an important field of synthesis chemistry; 6) the development and application of new technologies promote the deepening of the mechanism studies of organic reactions.

Through continuous support by NSFC, basic research on organic chemistry in China has made remarkable achievements in some areas such as metal-organic chemistry, physical organic chemistry, and asymmetrical syntheses and so on. Among the proposals funded by the Division in the past five years, those for organic synthesis chemistry account for 34.3%, metal and element organic chemistry for 14.9%, natural organic chemistry for 11.8%, physical organic chemistry for 13.8%, pharmaceutical chemistry for 7.1%, bio-organic chemistry for 8.5%, organic analytical chemistry for 0.7% and applied organic chemistry for 8.9%. Viewing the development of the disciplines, in synthetic chemistry, novelty and high-effectiveness of complex organic molecular syntheses should be emphasized and research on natural products and new compounds with important physiological function be enhanced. In metal-organic and element organic chemistry, fundamental studies of green chemistry in organic chemistry should be stressed and research on new regents, new methods and catalytic reaction with high selectivity be encouraged. In physical organic chemistry, the depth of theoretical studies of organic chemistry and the studies of structures and properties of new functional molecules should be further enhanced.

Research areas encouraged are studies on new reactions, reagents, techniques and methods of organic synthesis (particularly the reactions of organic synthesis with high selectivity and high efficiency, and green chemistry), research on super-molecular chemistry, molecular recognition and self-assembly, basic research on the synthesis and their physicochemical properties of new organic functional substances, studies of the discovery, synthesis and bionic synthesis of natural organic compounds with physiological activity and relatively new fashioned complex structures, studies with specific research objects on biomedicine, aiming at solving fundamental issues in chemical biology, generating new disciplinary growing points are to be stressed, including mutual recognition and interaction between small molecules and bio-macromolecules (for example, proteins, nucleic acids, polysaccharides, polypeptides and so on), organic synthesis and chemo-biological conversion with high-selection catalyzed by enzyme and mimetic enzyme, and research on other basic theoretical issues in the crossing and linking of organic chemistry with related disciplines (especially those facing national major needs and fundamental scientific issues in organic chemistry).

Division III of Chemical Science

Research fields funded by the Division include physical chemistry and theoretical chemistry.

Physical chemistry and theoretical chemistry are the theoretical foundation of chemical sciences. Its research subjects cover wide areas from mono-molecules, molecular aggregates to condensed states and from weak mutual action between molecules to the formation of

chemical bond. It makes molecular structural information from ground states to excited states and from steady states to transient states by means of modern detective techniques and methods of theoretic analysis. It has not only become the theoretical basis of all traditional branches of chemistry, but also crosscut with materials science, energy science, environmental science, life science and information science, generating many new disciplinary growing points. The research trends of physical chemistry are as follows: the combination of macroscopic and microscopic studies, the combination of bulk phase and surface/intersurface and the combination of static and dynamic states, and the control of chemical reaction are further developed, so as to make theories in closer combination with practices. Physical chemistry has played a more and more important role in the development of chemistry and related sciences.

Viewing the proposals funded by the Division in recent years, studies of structural chemistry, theoretical chemistry and molecular dynamics have attracted more attention from the scientific community in international competition and have become the competitive research direction in the discipline. However, the applications of solution structure, dynamic structure and various new spectral methods are relatively inadequate. Catalysis chemistry is one of the most active branches in physical chemistry. China's international influence has been greatly improved in recent years. Applicants need to pay more attention to the studies of chiral and biological catalyses in which the number of applications is not enough. In China, there is a large team of research in catalytic chemistry, so the number of applications per year in the field of catalysis occupies 30% of the total in the Division. The studies in electrochemistry and colloid and interface chemistry should lay stress on the intercrossing with materials and life sciences. Some studies have formed their own features in research direction. And the number of applications and funds basically remains unchanged. Research on chemical thermodynamics (including thermo-chemistry and solution chemistry) has been broadened in recent years owning to the integration with life science and materials science, and the combination with microcosmic studying means becomes a new developing trend. The number of applications is relatively small in the areas of photochemistry, high-energy chemistry and chemo-informatics.

Projects in physical chemistry should aim at disciplinary frontiers and national goals, and strengthen the creative, systematic and in-depth studies. The Division will encourage further intercrossing and fusion with other disciplines to develop new concepts, theories and experimental methods by bringing into full play the features of the discipline. In the selection of research topics, basic studies with scientific foresight, exploration and possibility of becoming new disciplinary growing points should be emphasized, as well as those with important theoretical significance and potential for application. Meanwhile, it encourages researchers of other disciplines to apply interdisciplinary projects supported by the Division, but the applicants of other disciplines should emphasize more on the problems of physical chemistry in their applications.

Research areas encouraged are basic research on interface chemistry and its application in materials and life sciences, new methods of theoretical chemistry and their applied basic research in the fields of life, materials, environmental and information sciences and so on,

studies on new catalytic materials, new catalytic reactions, catalytic action and mechanisms of reaction, *in-situ* dynamic characterization techniques, applying basic research of catalysis in energy, resources and environmental areas, basic studies of electrochemistry with important potential for application, thermodynamics of complex systems, studies on the regulating and controlling methods of synthesis processes of materials with photo-, electro- and magneto-functions and the fundamental physicochemical process in liquid and solid phases, new ideas and methods in chemo-informatics, physiochemical issues in life system, and fundamental issues of physical chemistry in nano-sciences and technologies.

Division IV of Chemical Science

Research areas supported by the Division include polymer science and environmental chemistry.

Polymer Science

Polymer science is a discipline that deals with the synthesis, molecular structure, chain structure, aggregation structure, properties and functions of polymers as well as their utilization, and takes synthetic polymer, natural macromolecules and bio-macromolecules as its objects of study.

For polymer chemistry, major research directions are the studies of 1) methodologies for the synthesis of mono-polymers and copolymers from monomers, the polymerization reaction with controllable molecular mass and structure of products and the biological synthesis of polymers; 2) chemical reactions involving polymers, such as chemical change and modification of macromolecules, chemical issues in polymer processing and utilization, degradability after use and chemical or physic-chemical changes of cyclic utilization or regeneration of polymers and biochemical effects of macromolecular; 3) studies on functional polymers such as polymers with electronic, optic and magnetic properties, and polymers for biomedicine (including sustained-release drug carrier, tissue engineering scaffold material and embedded medical parts), energy transformation, adsorption and separation, catalysis as well as other reagents, sensor and molecular recognition are explored. Special attention should be given to the study of tectonics and stereochemistry of new structural polymers, such as hyper-branched polymers or dendrimer. Studies of new polymerization reactions and the development of polymerization systems with original creativity should also be noticed.

For polymer physics, important topics are to advance new concepts of condensed state physics of polymers, to improve the studies of structure and phase transformation of polymers and the structure and dynamics of sol-gel formation, to obtain a deeper understanding of crystal phenomena, liquid crystals and glassy states. The studies of aggregation structures for whole systems from single chain, oligo chain to bulky parts before and after shape-forming processing should all be stressed. The structure of polymers

in restricted space, the structures and properties of surface and interface, the nano microstructure and the size effect of polymer, as well as the dynamic change of polymer structures, morphology and relations of structure with physical property should be paid attention to. And the studies of polymer solution and rheology (including rheology of complex fluids and chemical rheology) should also be strengthened.

Research areas encouraged are interdisciplinary studies between polymer science and information science, life science, physics, materials science and food science, especially the studies to develop the theory of soft matters, the polymer electronics and the polymer photonics by making use of new theories and methods from physics, to find out the growing points and opportunities of polymer development in the study of natural macromolecules and bio-macromolecules, to explore new areas and directions for polymer development between the gap of synthetic polymers and naturally existed bio-macromolecules, to emphasize the studies of bio-mimic polymers, super molecular structures, assembling and regulation of ordered structures of macromolecules, and to develop the chemical biology of polymer.

Among the applications in polymer science in 2005, the proposals for research on the following areas hold the higher percentage: controllable radical polymerization, synthesizing polymers by microbial technologies, chial polymers, biomedical polymers, anionic and coordinative polymerization, polymers with electronic, optic and magnetic properties, polymer field-effect transistor, photovoltatic polymer, polymer gel, hybri-structure and materials of inorganic/polymer, crystallization of polymers, structure characterization of polymer, polymer processing, surface and interface of polymers, bioactive macromolecules, dendrimers and hyper-branched polymers, and computer simulation of polymers. On the contrary, the proposals for research on super-molecular polymers, exchanging-place polymerization of ethylenes, positive ion polymerization, synthesis of high throughput screening of polymers (combinatorial chemistry) and alloying in line are not enough. In selecting subjects hereafter, applicants should note the development frontiers of the discipline, but not follow blindly hot subjects while ignoring subjects received less attention and basic scientific issues not resolved at present in the discipline, and should be good at extracting core scientific problems from the industrial practices. Meanwhile, they should give a clear statement of scientific issues to be studied, emphasize the scientific value, and not have a too broad theme in the proposals.

Environmental Chemistry

By interpenetrating with other disciplines, environmental chemistry has constantly formed its own features. It has gained rapid development in environmental analytical chemistry, environmental pollution chemistry, pollution-control chemistry, pollution ecological chemistry and environmental theoretical chemistry, and is playing an increasingly important role in basic research and solving national major environmental problems and so on.

Viewing the applications of environmental chemistry in recent years, studies on the

existence, behavior, effect and control of pollutants in various media are the main themes of the discipline. The research has been continuously deepened from microcosmic to macrocosmic and from static to dynamic. The intercrossing and fusion between disciplines are very evident. There are more applications in control chemistry of environmental pollution, environmental pollution chemistry and pollution ecological chemistry. Major research orientations are as follows:

1) New analytical principles, methods and technologies of pollutants and their polluting processes to the environment;
2) Important chemical reaction, transporting mechanism and species structural changes of pollutants at the interface of different media and their bio-ecological effects, including the formation of fine particles in the air, analyses of resources, interface reaction, affection to human health, and the shift and conversion of pollutants in the interface between water-deposit/soil;
3) Interactions and synergistic effects of pollutants in the environmental system;
4) Environmental behavior and ecological effect of heavy metals with different species, persistent organic compounds and endocrine disrupter compounds as well as their harm to biological systems;
5) Technologies and principles of controlling air pollution, renovating polluted water bodies and soils, and new technologies and reusable principles of treating solid waste substances;
6) Forming mechanism, ecologic-toxicology and risk evaluation of pollutants' ecological effects;
7) Relation of structure/effect and dose/effect of pollutants and forecast model of environmental pollution, as well as other studies of frontier and creativity in environmental chemistry.

Research areas encouraged include the separation and analysis of ultra-trace hardly degradable toxic organic pollutants, the environmental behavior and dynamic analysis of interface processes of pollutants, the mutual action, complex pollution processes, mechanisms and effects between pollutants and organisms, the evolutional process and mechanism of the environmental qualities of regions, the air, water and soil pollution control as well as renovating principles and technologies after pollution, and new technologies and reusable mechanism of treating solid waste substances, the application of nano-materials in the fields of renovating ecologic environment and pollution controlled as well as their influence to ecological environment, the methodologies of bio-ecological effects and risk evaluation of air particles and toxic chemicals exposed for low dosage and long time, and the studies on environmental behavior and ecologic-toxicology of new toxic pollutants.

Division V of Chemical Science

Research fields funded by the Division include two areas: chemical engineering and industrial chemistry. The research contents of industrial chemistry are covered in the Guide of chemical engineering.

Chemical engineering is an applied science that is to study the motion, transfer, reaction and their mutual relation in the conversion processes of matters. Its tasks are to recognize the transfer of matters in the conversion processes and its effect on reaction, to study technologies, to study flowchart and equipments for the effective conversion of substances, and to establish theories and methods of design, scale-up and control for use in industrially production.

In recent years, chemical engineering is facing with an unprecedented development opportunity, its research contents are revealing a lot of new changes, which are mainly in the following forms: studies have been shifted from traditional chemical processing engineering to chemical product engineering, from measurements and correlation of gross properties to observation, measurements and simulation at multi-scales, specially research on the reinforcement and scale-up rules, from common systems to uncommon and extreme processes, and from incremental improvement of existing methods to exploratory studies of new concepts and systems. It has become a major developing trend of chemical engineering that extracts key scientific issues from complex studying systems and has gradually formed systematic theories and knowledge.

The Division will give preferential support to the studies of basic theories and key practical technologies in chemical engineering and industrial chemistry, as well as fundamental engineering issues of sustainable development, which aims at enhancing the overall national strength and creativity. It gives particular consideration to the following two research areas: 1) in light of the national conditions, national needs and goals, great efforts shall be made to explore frontier subjects in new and high technologies of chemical engineering and newly emerged disciplines and to emphasize on the crossing of multi-disciplines, specially from which to extracts problems related to chemical engineering, so as to promote the development and creation in scientific ideas and technical means; 2) under the guidance of national goals and social needs, systematic basic research and accumulation should be enhanced for key technologies in chemical engineering related to national economy and people's welfare, so as to gain systematic understanding on the laws, to develop and consummate the theories on the discipline and to play the guiding role of basic research.

Research areas encouraged are the measurement, computation and stimulation of fundamental data of substantial properties, transfer processes, separation and purification, chemical reaction engineering, chemical systematic engineering, inorganic chemical engineering, fine organic chemical engineering, bio-chemical engineering and food chemical engineering, energy and materials chemical engineering, chemical metallurgy, and environmental and ecological chemical engineering.

Department of Life Sciences

The Department of Life Sciences consists of nine divisions covering three main sections: biology, agricultural science and medical science. Research on the essence and the function rule of life activities are essentially related to the environment, natural resources, agriculture, population and human health, etc. Life is surely the most fascinating phenomena among the cognition process of human to nature. It has also provided and is providing unprecedented opportunities for people to revealing and understanding ceaselessly the basic principles governing life in a deeper way, due to the great progress in life sciences in the 20th century. Mysteries of life are also attracting other branches of science from mathematics, physics and chemistry into life sciences, which makes life science one of the most active research areas of the world in the 21st century, and it is also closely related to the economic development and social progress in our nation.

Funding for General Program Projects in the Recent Two Years

Unit: 10,000 yuan

Scientific Division		2004			2005		
		Projects granted	Funds	Rate (%)	Projects granted	Funds	Rate (%)
Division I	Microbiology	121+12*	2,618	21.91	122+13*	2,332	19.45
	Botany	111+14*	2,468	24.80	114+13*	2,998	20.16
Division II	Ecology	87+14*	1,919	21.72	100+11*	2,595	19.01
	Forest science	81+12*	1,810	20.48	91+13*	2,395	17.36
Division III	Biophysics, biochemistry and molecular biology	112+14*	2,478	19.93	119+13*	3,185	20.26
	Genetics and developmental biology	100+12*	2,190	26.79	101+12*	2,725	24.15
	Cell biology	92+12*	2,026	23.16	104+12*	2,734	21.01
	Immunology	99+11*	1,141	18.33	109+12*	2,888	15.63
Division IV	Neuroscience and psychology	114+12*	2,541	20.59	133+15*	3,527	17.83
	Biomedical engineering	113+10*	2,520	22.12	128+10*	3,346	17.31
Division V	Agricultural science	264+25*	5,707	17.81	296+25*	7,678	17.29
Division VI	Animal husbandry, veterinary science and aquatic science	161+14*	3,466	18.72	179+14*	4,645	16.33
	Zoology	73+11*	1,609	23.27	82+11*	2,166	23.72

(*Continue*)

Scientific Division		2004			2005		
		Projects granted	**Funds**	**Rate (%)**	**Projects granted**	**Funds**	**Rate (%)**
Divsion VII	Physiology and pathology	268+25*	5,816	16.24	300+24*	7,831	13.36
	Preventive medicine	186+13*	3,984	18.39	203+13*	5,243	15.67
Division VIII	Basic clinical medicine I	269+11*	5,622	14.93	285+16*	7,374	11.76
	Basic clinical medicine II	205+22*	4,455	14.22	239+16*	6,239	11.79
Division VIV	Materia medica and pharmacology	125+12*	2,711	20.00	140+14*	3,683	16.94
	Traditional Chinese medicine and materia medica	203+24*	4,444	15.66	218+24*	5,756	12.64
Total		2784+280*	60,525	18.39	3,063+281*	80,240	15.62
Average intensity per project		19.75(20.94**)			24.00(25.46**)		

Note: * Projects of Small Fund for Exploratory Studies.

** Average intensity of General Program projects in 3 years.

In recent years, with the funding of NSFC and the steady efforts made by Chinese scientists, Chinese life science research has been developing quickly and evidently. Research papers written by Chinese scientists published in *Cell*, *Nature*, *Science* and other international authoritative journals are increasing, illustrating that the Chinese basic research in life sciences is stepping into the international stage.

The Department of Life Sciences received 21,408 proposals for General Program projects in 2005, 4,754 (or 28.51%) more than the previous year, and 3,344 projects were funded (including projects of Small Fund for Exploratory Studies), with a funding rate of 15.62%, and the average funding intensity is 240,000 yuan per project. Among which, there are 3,063 General Program projects with a research period of 3 years (compared to 2,784 projects in 2004), the funding rate is 14.31%, and the average funding intensity is 254.600 yuan per project (209,400 yuan in 2004). In the near future, the Department will comply NSFC funding principle of controlling the funding scope moderately, and enhancing the funding intensity gradually to further increase the intensity of General Program projects. The funding intensity of 3-year General Program projects will reach 280,000 to 300,000 yuan per project in 2006.

The Department strongly encourages researches with innovative academic thoughts, techniques and approaches, particularly those with original innovation ideas and having the capacity prompting the development of related disciplines, and high emphasis is on the new theories of hypotheses proposed on the background of research over a long period of time. It fully supports interdisciplinary projects, especially innovative projects integrating different academic ideas. Classical biosystematics (taxonomy of animals, plants and

microbe) is a very fundamental discipline of biology. Due to various reasons, this field is getting shrinking, especially lack of young researchers of high accomplishments. The Department has continuously provided a preferential fund of 3 million yuan each year to support classical taxonomy of animals, plants and microbe since 2002, and it will keep encouraging and supporting vigorously researches in this field in 2006. The Department set off part of the total budget to support such fields as genetic analysis of important typical bio-resources (including pedigree hereditary family), immunology, development biology, structural biology and related branches preferentially concerning the basic research of life sciences in 2005. Meanwhile, the Department will give preferential support to the research of sports medicine concerning the Science and Technology of Olympic Games to meet the demand in magnitude of the nation. In the near future, the Department will attach close attention to important and frontier areas of life sciences, and will also give preferential support to the fields relating to the development of national economy, environment and ecology, population and health.

The Department of Life Sciences encourages scientists to take part in the systematic and innovative work centering on key problems in long-term research, and will continually regard and strengthen project management at later stage, implement the policy of linking performance with funding, and give preferential consideration to applicants with a good performance in the latest project. It encourages substantial international cooperative research, encourages excellent researchers abroad to come back and undertake their research in China. But in recent years, there is an increasing tendency that some institutes or universities apply by using overseas scientists. The Department reminds such units, applications will not be supported if the applicants are still abroad and cannot spend the majority of their time and energy to do research in China. If such cases occur, the application will not be sent for peer review.

Moreover, considering the problems occurred in the application and peer review in recent years, the Department reminds applicants to pay special attention to the following points when writing proposals:

1. In the column of resume, detailed information concerning the applicant and members of the group is needed, such as employment, education, previous projects funded, results of fulfillment and related papers. Papers published and to be published should be listed separately. As for the published papers, all the authors, theme of the paper, year, periodical and page numbers should also be provided.
2. The applicant should state his or her background in detail related to the proposal, and the experiment basis of his (or her) new assumption or new hypothesis, necessary predicted results, etc. Papers published beforehand should be indicated clearly, and for papers to be published, related data of important experiment results, such as photographs or diagrams of the experiment, etc., should be provided.
3. The research scheme, technique path and method are the important index for the reviewers to evaluate the feasibility of the project. So, in the proposal, the experiment plan should be complete and accurate, the technique path should be definitude, and curtness and vague should be avoid by all means. It is suggested that there should be one more scheme

in reserve for use in case of some key technique scheme failed and for reference when evaluated by experts.

4. For new proposals based on projects funded before, applicants should describe the progress made in detail, and the difference and connection between their proposals and the former projects. If there is some conjunction with other projects, the similarities and differences between them should also be explained.
5. Concerning proposals related to medical ethics, applicants should give the certification of ethic committee from their host institutions, or the superior administrative agencies. For research using genetically modified organisms, the source should be indicated, and if donation is needed from other laboratories, the agreement from the donors should be attached.
6. For applications involving international cooperation or with team members living abroad, applicants should offer the agreement or protocol for international cooperation, or the certificate for affirmation of the members concerned.

Applications will not be funded if they fail to meet the requirements for filling in proposals, or fail to offer materials needed.

Division I of Life Science

The funding scope of the Division covers microbiology and botany, supporting mainly basic research related to plant and microbe in bio-resources, phylogeny and evolution, physiology and metabolism, etc.

Microbiology

The Division supports basic research and applied basic research in microbes (including uncultivated microbes), principally in the areas of heredity and development, physiology and metabolism, structure and function, resources, ecology, phylogeny and evolution at different levels of microbes. Researches on the reciprocity mechanisms between microbe and the host, or between microbe and the environment, and system researches about model microbe and the international frontier subjects are encouraged.

Analysis of proposals received and projects funded by the Division in recent years suggests that the workforce of microbial research in China as a whole increases continually and is developing healthily with the potential of competing in some areas in the world. There still, however, exists such weakness as obviously decentralized research directions and workforce. Questions exist universally are that few innovative projects are proposed based on available unique materials, sometimes new and innovative idea is proposed but workforce is too week to implement them, some research with original findings can be not kept up further, and research content is over-scaled or too vague and general.

In the past few years, NSFC has launched a series of measures to encourage research

innovation, and has called for projects with creative ideas and funded them through various approaches. The funding for microbiology is increased remarkably and most outstanding projects with obvious creative ideas have been supported. Besides, in order to use the funds more effectively, the Division gives an important consideration on the preference of applicants' scientific research background, potential and previous projects when evaluating their new applications each year.

In order to stabilize the research workforce and to bring up new specialists on classic fungi taxonomy, the Division will continue the policy to give preferential support to "the classic fungi taxonomy" in 2006.

Botany

Botany is the basis to solve the great demands of food security, population healthy, bio-resources and environment in China. Along with the development of botany, interpenetration and crosscutting between different disciplines and the emerge of many newly growing research areas, research on major scientific issues is developing towards multi-disciplinary, systematic and internationalized involvement.

The analysis of applications received and projects funded by the Division in recent years shows that the number of applications involving plant phylogeny and evolution, phytohormones, plant growth and development, water potential and resistant physiology is relatively large, with a trend of vigorous development, and various new methods and techniques are widely used. Genomic research has great influence on botany and the excavation and studies of functional genes have become a hot area of application. In this subject, applications with rice and Arabidopsis as the object of model plant will be encouraged. China has abundant plant resources but the related basic research and accumulation are insufficient. The Division will encourage research actively with multi-disciplinary involvement, particularly research connecting with earth sciences, information sciences, ecology, chemistry, genomics, etc., in order to promote effectively the conservation and utilization of plant resources in China.

The Division will give preference to research which can resolve key scientific issues of the field, multidisciplinary crosscutting and newly expanding disciplinary research, such as systems biology and evo-devo, will be encouraged, and support to creative young scholars will be intensified.

Research in the fields of plant taxonomy, phylogeny and evolution is becoming increasingly complicated. In the future, the integration of micro-research with macro-research, field investigation with indoor experiment should be strengthened in the studies of speciation, phylogeny and evolution, biogeography, etc.

Classical taxonomy is the important foundation of botany. The Division will continue to

give preferential support to research on important species and populations, and highlight the investigation of geographical flora in key or weak areas.

Research in phytomorphogensis and phytoembryology has developed into the exploration of mechanisms underlying structure-function relationship and regulation of development process. Its combination with reproductive biology, developmental biology and genetics will be further addressed, and a high value will be placed on the mechanisms underlying plant morphoresis and its development process.

Studies in the field of phytophysiology have reached the molecular level. Encouragement will be given actively to in-depth studies at cellular, individual or multiplayer levels on the mechanism underlying energy metabolism, growth and development regulation, adaptability and stress resistance, mechanism of hormone function, information transmission and the interaction between botany and microbiology.

Research on plant resources covers the protection and sustainable utilization of vegetation, species and genetic resources (including special metabolites). In-depth and systematic studies on endemic and economically important plants (e.g. wild plants for medicine, for food or for industry with Chinese characteristics) should be further strengthened, and the ethno botany will be highlighted. Synthesized researches on hot spots in biodiversity, conservation biology should be encouraged.

Division II of Life Science

The Division supports subjects on ecology and forest science, and the long-term accumulation of experimental data is fundamental to both disciplines.

Ecology

The aggravation of global ecological environmental issues and the demand for scientific theories for sustainable development give impetus to the rapid development of ecology. While exploring the mechanism underlying organism-environment interactions, and biological evolution and adaptation to the environment, ecology is actively developing new theories and methods for solving regional and global environmental problems.

The developing trends of basic ecology include: 1) vibrant crosscutting of ecology with other disciplines, being of great importance to the development of ecological theories and methodologies, is so active that its crosscutting with chemistry, earth sciences, information sciences and management sciences has become the indication of its complexity; 2) research is developing towards both multi-scales and multi-processes, and molecular biological technique, remote sensing and GIS have been increasingly applied in ecological research; 3) a higher value is being placed on field station based experimental ecological research.

Analysis of the projects funded in the past few years shows that ecophysiology, population ecology and animal behavior ecology are the fields which have received more funding than others. Research in the fields of long-term station-based experimental ecology, ecosystems ecology, landscape ecology, regional ecology and ecological safety still remains to be weak in spite of their increased number of applications and projects funded in recent years, and should be further strengthened.

The common reasons for the failure of many applications of ecology to be supported include: 1) the research scope is too big, the definitions are ambiguous and ecological scientific issues are not well addressed; 2) independent innovation is insufficient, which only tends to follow suit of foreign research; 3) the description of research approaches and techniques is not clear enough, and new technique is used inadequately or not connected tightly with ecological problems.

Encouragement will be given to multidisciplinary research with strong innovative ideas linking theory with practice, especially to research which may hopefully make major breakthroughs in new theory and new methods, and basic research closely related to the ecological features of Chinese environment. The combination of field observation, controlling experiments, models and modern technical means will be advocated.

Forest Science

Modern forest science gives a high value to the interconnection between population, individual, cell and molecule, to the understanding of important theoretical problems of forestry from the system and synthesis point of view. It has become the magnitude power for the crosscutting between forest science and molecular biology, materials science, space and information science. The social, economic and service functions of forest have become the most important subject of research. The multidisciplinary and synthesized studies of the growth and development rules, the sustainable management theory, the multi-service functions, the hereditary rule of important properties of forest and bio-techniques and the management of forest resources and information techniques have become the frontiers and hot spots in forestry.

In recent years, basic research on forestry in China is developing rapidly, indicated by: 1), the research workforce is growing continuously and research proposals are also increasing rapidly. The number of General Program projects funded in 2005 reached 599, which is doubled in 3 years. The funding has been increased by 27% annually since 2002; 2) the quantity and quality of papers published have been improved evidently, and our research features have been formed in some research fields. However, there are still typical problems in the basic research on forestry in China, such as most of the researches following others abroad, insufficient creativity in their academic ideas and methodologies, loose connection between scientific issues and major scientific needs of forestry in China, over-scaled subjects, vague and general content, etc. There are less excellent applications from young scientists, and the outstanding young researchers are scarce. In some traditional subjects, like taxonomy

of forest organisms, applications are less, showing a tendency of shrinking.

In 2006, the Division will encourage basic research centered on key scientific problems, and the typical problems for the national demand on forestry in major engineering projects on the basis of fully protecting free exploration. Support will be given vigorously to basic research on the growth and development of forest (including garden forest), basic research on the restoration of forest vegetation, protection and sustainable development, research on the mechanisms of controlling and forming of forest production, basic research of the prevention and effective control of biological disasters of forest, the heredity of forming mechanism of important characters of forest, the theory of genetic improvement of multi generations and its innovation of methods, the multi-service function of forest, and important basic research during the exploitation and utilization of forestry, etc.. Preferential support will also be given to the applications on the taxonomy of forest bio-resources.

Division III of life Science

The Division covers five first-grade subjects: biochemistry and molecular biology, biophysics, genetics and development biology, cell biology and immunology. They represent the most fundamental and frontier research, which is one of the most active research areas in life sciences.

Biochemistry and molecular biology

Biochemistry and molecular biology is one of the most frontier and active subject. The research areas funded in this subject include protein and peptide, nucleic acid biochemistry, enzymology, polysaccharide and glycoconjugate, incretion, biological membrane and inorganic biochemistry.

Proposals received by the Division in biochemistry in 2005 have such characteristics. The applications of structural biology include protein crystallography, and protein and other large biological molecular research by NMR is increasing compared with that in the previous years. Applications from young scientists were 15% more than the large marginal increase in 2004. But as to the content of the subjects, although applications in signal transduction, proteome and the structure and function of protein are more than other subjects, they lack enough innovation and applications in molecular biology with new techniques and new methods are fewer.

The Division will place emphasis on funding the following aspects:

Research on protein formation, fold and movement, function and the reciprocity between proteins is an important aspect of biochemistry. As the program of human genome has come to conclusion and an era of functional genome has been ushered in, protein research

is faced with new tasks. Functional protenomics and bioinformatics have gradually become the new subjects in this discipline. The Division will encourage the development and introduction of new techniques, such as the separation and purification of proteins and the innovative techniques on the interaction between proteins.

DNA and RNA are the genetic information molecules, and research on their structures and functions and the interaction between proteins is a more fundamental subject in this field. Research area like regulation of gene expression is one of the priorities in the field of nucleic acid. The function and mechanism of RNA in gene expression regulation have become a heated area for biochemistry research in recent years. There still remains room to conduct research on many important issues, like RNA selective splicing, RNA editing and snRNA in transcriptional control in nucleus. siRNA and miRNA are two newly discovered small RNA molecules whose functional mechanism in biological development and evolution has received considerable attention in recent years. The expression and new function of miRNA in normal physiology and pathology are also one heated area.

The structure and function of membrane proteins and their interaction with membrane lipids are the emphasis of bio-membrane research in the Division. However, research efforts have confronted with difficulties due to the complexness of the biological membrane system. Research on polysaccharide and glycoconjugate also presents a heated area of biochemistry and molecular biology currently. Researchers are also experiencing difficulties due to the sophisticated components, structures and synthetic regulation of glycochains. In the past 3 years, the applications of biomembranes and polysaccharides only account for 8-10% of the total. Therefore, the Division will take encouraging and sustaining measures.

Biophysics

Biophysics is one subject of biology that studies the relationship of structure and function of different bio-layers using the concept and methods of physics, the physical and physiochemical processes of life activity, and the physical characteristics of matters during the process of life activity. Biophysics aims at clarifying the laws of motion of matter, energy and information of organisms in certain space and time. This subject is developing rapidly in recent years and has reached the international advanced level in certain areas, forming their own research accumulation and technological reserves. But as a whole, research on the fundamental aspects still remains weak.

Characteristics of the applications in biophysics in 2005 are as follows: the quality and quantity of the applications in theoretical biophysics have been greatly improved, the research contents of applications mainly focus on the structure and function of proteins, and the construction of bio networks; environmental physical factors such as ionization, electro-magnetic interference (EMI), and their biological effects and their mechanisms of function still concentrate on the cellular level; there is a comparatively broad scope in bio-acoustics and bio-optics, there are preferably bases and groups within the country in membrane and cellular biophysics, they have a high level of applications, but laboratories

with competitiveness are limited.

The subjects of biophysics supported include theoretical biophysics, environmental biophysics, membrane and cellular biophysics, molecular biophysics, etc. Biophysical research is benefited in methodology from the multidisciplinary intercrossing and permeation with mathematics, physics and information sciences and other areas to life sciences. The Division will encourage continuously multidisciplinary studies in bioinformatics, systems biology, computing biology and single molecular technique. High value will be given to basic research on membrane and cellular biophysics, and molecular biophysics, and the development of new methods in structural biology will be encouraged, such as new methods for protein crystallography, heteronuclear multi-dimensional NMR, Bio-mass spectrometry and electro-microscope, and by using them in the functional research and structural measurement of proteins and other bio-molecules. Attention will also be given to encouraging research on the mechanisms of environmental physics factors to the organism in cellular and molecular levels, and research on the effects to organism in micro gravity conditions.

Genetics and Developmental Biology

Heredity is the core section among life phenomena. Genetics covers not only research on the transmission and expression of inherit information, but also research on various life phenomena by genetic methods. The study of concrete problems in life sciences using genetic methods like heredity and variance, etc., has become the essential aspect and the mainstream.

The scope of research on genetics includes chiefly two aspects: firstly, plant genetics, animal genetics, microbe genetics, human genetics, medical genetics, somatic cell genetics, genomes (including comparative genome and evolution) and epigenetics; and secondly, research areas with genetic means and methods, mostly by using model organisms (yeast, drosophila, nematode, zebra fish, mice, rats, chicken, primates, Arabidopsis, rice, etc.) to establish different research models, such as human diseases, animal and human behavior, resistance of animals and plants, and the interaction between organisms and the environment, etc.

For applications in 2005, the separation of functional gene still remains the large part, including human disease genes (like various hereditary diseases, tumor, complicate polygene diseases, etc.), research on the genes of important characters of plant, genes of resistance to diseases and stress resistances, which are also the mainly supported part by the Division. The number of applications on the expression and control of genes, especially proposals related to epigenetics is still low although this area is very active in recent years (like the controlling function research on different RNA genes), which should be stressed by the Division. Applications are insufficient in the study of gene functions using model organisms (including the use of gene nock-out and gene transfer to build up different research models), which is the important area supported by the Division. Furthermore, the establishment of

related platform of functional genome research (including the building up of various mutants, especially animal mutants) is also very important, and will be highly valued.

In 2006, the Division will continuously stress the purification and identification of related disease genes by using the pathogenesis and isolated populations in China, especially highly value the collections of samples and related gene research on neurotic system diseases, mental diseases, osteoporosis, heart blood vessel diseases, diabetes and tumor, other complicated polygene diseases, etc. The separation of plant functional genes and the identification of gene functions will also be emphasized. The Division will stress systems biology in the study of genetics and will encourage various crosscutting researches based on bioinformatics to carry out prognosticate of gene function, information characters of genome structures, comparative genome, and HapMap (including SNPs).

The relationship between genotype and phenotype is an important part of genetic research. The unceasing development of different research methods has led to the disclosure of molecular mechanisms behind various life phenomena from gene level, especially the complicated phenomena of organisms, such as animal behaviors, the heterosis of plants, etc. In the future, more attention will be paid to the study of a specific life phenomenon to find out its laws and principles at molecular level.

Development is the most basic life phenomenon and developmental biology is an active research field. covering such important subjects as every process from gamegensis to fertilized occyte, from embryo to morphorgensis and the formation of organs, and eventually to the completion of a whole living individual, and till caducity and death. Developmental biology studies a wide range of issues including the growth of various types of cells (nerve cells, immune cells, etc.), the differentiation and apoptosis, the maintenance, regeneration and rehabilitation of tissues, the division and differentiation of stem cell, the reprogramming of somatic cells and nuclear-chloroplast interaction, the control of the size of cells, etc.

Cell Biology

Cell biology, a fundamental field in life science, is a discipline focusing on the phenomena, laws and mechanisms governing cell activities. Modern cell biology should take functional or mechanism questions as its major research theme, and try to discover the mysteries closely related to the cells' activities at molecular and cellular levels or even on the individual level by using various types of effective approaches.

The areas supported by the Division in cell biology mainly include cellular and sub-cellular structures, the proliferation and growth of cells, the differentiation of cells, the aging, death (including apoptosis) and migration of cells, the communication between intercellular and extracellular matrix, cell signal transduction, the engineering of cell and tissues, the interaction among cells, substrate transportation (trans-membrane transportation and vesicle transportation), and the new technologies and methods on cytology.

There remains a considerable gap between China's cell biology research and the international advanced level as a whole. On the one hand, the research team in China is not large and backbones of high level are few. On the other hand, many researchers are focusing their interests out of the main artery. What worth special mentioning is that some researchers still do not master the thorough research strategy, and can not design scientific and reasonable plan from the international artery. Recently, some young accomplished scientists returned form abroad have greatly strengthened the ability of cell biology research within the country, with certain achievements made in cell signal transduction, cell cycle regulation, cell apoptosis, cell division, etc.

In 2005, most of the applications still concentrated on the single gene function in some phenomena of cell physiology (including cell caducity, death, transfer, substance transport, etc.) or some processes (like cell proliferation, division, differentiation and so on), which are still the chief points of support at present. But applications are less in the subjects below: signal transduction between or within cells, interaction and effect between DNA, RNA and/or proteins (including ornament and degradation, between subcellular shuttle, transport and location), subcellular formation, constitute of cell polarity and the interaction between cells, which are the hot pot research areas and assure high future value.

In 2006, the Division will continue to support research on the interaction between genes and cell physiological functions, and the interaction and effect between molecules. Meanwhile, the Division will pay attention to the study on individual level, like different typical characters manifested on individuals (like senses, biothythm, etc.), special physiological phenomena of process manifested of cells in typical conditions (like diseases, resistance or anti-diseases, interaction between pathogeny and host, and so forth). The molecular mechanisms among them have already become another heated point in cell biology.

In anthropotomy and tissue embryology, support is mainly provided to the configuration and structure of human cells, tissues, organs and systems, and new application of methods in such fields.

Immunology

In 2005, proposals received and projects supported in immunology basically reflected the mainstream and direction for the development of immunology today, and the number and intensity of funded projects increased to some extent. There remains a considerable gap between our immunology research and the international advanced level as a whole. The research quality of each branch within this subject also differs obviously. The Division will support basic and applied basic research as follows: 1. to strengthen the research of differentiate development of immune cells and their mechanisms of controlling, especially the new study system or method, like systems biology, cell net ware and so forth, emphasize the research on function and mechanisms of gene control and signal transfer in immune

response, immune regulate and immune effectiveness; 2. to pay attention to research on the mechanisms of immune heredity and immune disease of major diseases, especially diseases unique to China; and to pay attention to the interaction and regulation of nerve-incretion-immune system during the disease process by using the popular patients, broad resources of samples in China, to strengthen the combination of basis and clinics, to strengthen basic and applied basic research based on clinics. 3. for the study on immune diagnostics, to stress researches with indigenous innovation of new techniques and methods, the introduction and improvement of techniques and methods that could meet major national demands; 4. for the study of immune prevention, apart from further strengthening research for improving the existing bacteria and mechanisms likelihood, to strengthen research of new bacterin with new theories and new achievements of immunology; and not only regard the study of initiative immune technology, but also the passiveness immune techniques like antibody and the related. 5. for the study of immune techniques, to strengthen the cooperation with multi-subjects, especially the cooperation with chemistry and physics, and to use the new concept and new techniques to the research of immunology; 6. for the immune therapy, attention will be paid to the establishment and utilization of disease-concerning model animals; to the study of the combination of extra or intra-corporeal or in vivo; cooperation and crosscutting of different subjects are particularly significant; 7. for the study of transplant immunology, further stress will be attached to the connection of basic research and clinical research, research on induce and tolerance of transplant, and the study of new theory and method of immune tolerance and rejection of transplant.

Division IV of life Science

The funding scope of the Division covers neuroscience (neurobiology, neurology and psychiatry), psychology, biomedical engineering, and medical imaging and radiation medicine. The projects are apparently multidisciplinary in nature. While the application of quantitative methods may bring revolutionary changes in biomedical research, the combination of mathematical, physical, chemical and engineering studies with biomedical science will deepen our understanding of complex biological systems by integrating knowledge from various disciplines and at different levels. The crosscutting of social science with natural science is also encouraged to study the interactions between social or environmental factors and organisms and the underlying mechanisms. Besides, researchers are encouraged to adopt the international standard model animals and the ethic demonstration of animal and clinical experiments.

Neuroscience and Psychology

Neuroscience and psychology are among the most rapidly developing fields in life sciences. They all address the relations between brain and behavior, which attract more and more scientists to challenge the secrets of brain.

In recent years, the number of applications concerning basic research of the two subjects

has been on the constant rise, about 200 annually in total, and with a slight increase this year. As to the contents of these research projects, most of them get involved not only in the basic processes and rules of the movement of nerve system, but also in their relationships with the diseases of the nerve system. In 2005, applications for neurology and psychopathy were increased obviously, from 162 in 2001 to 428. Generally speaking, the nerve system disease-related research subjects receive more attention, and particularly research on neuronal degeneration has witnessed comparatively rapid growth. Various new technologies like RNA interference and proteome approaches have been widely adopted. However, most of the applications lack the argumentation regarding their feasibility and especially necessity. At present, most researches are performed at molecular or cellular levels while integrated system researches are scarce. In the area of basic nerve biology, more and more applications are developing international competitiveness. Those research teams that are able to make in-depth research in some aspects are more likely to be supported. For instance, research on pain has been a priority area in favor of funding support for years. Applications concerning the molecule regime of medical addictiveness have been on a considerable increase in both quantity and quality. Multidisciplinary research has become a development tendency nowadays, in which the comprehensive research approach of behavior, imaging and genetics has become a popular research model in psychology and psychiatry. Research on children's cognitive ability and behavior model in cyberspace circumstances has also received some attention. Chinese language cognitive research still remains a priority area in favor of funding in recent years.

The Division will strengthen its support in the integrated research with emphasis on the basic movement of nerve system, the processing of nerve information and the new functional genes of neural system, which will drive the development of the whole neuroscience. Importance will be attached to research on some significant frontier issues, like the development, aging, regeneration, damage, neuron repairing, etc. As far as research on neural diseases is concerned, support will be stressed on creative fundamental studies, especially those applying new approaches and concepts in neuroscience to solve clinical problems. Cooperative endeavors to carry out in-depth research are encouraged between clinic doctors commanding valuable genetic resources and pathologic nerve specimen and researchers dedicated to basic knowledge, and research team of this type will receive favorable funding. In the area of psychology research, efforts are encouraged to initiate research on psychological health care (i.e., cyberspace addictiveness, juvenile delinquency, etc.) and behavior genetics. Research on neuropsychology using the favorable resources in China will continue to receive support. Given the fact that engineering psychology is one of the weak points in China's psychology research, more support will be given in this regard.

Biomedical Engineering

In the past few years, biomedical engineering in China has developed quickly and has attained international advanced level in some aspects, laying the foundation for both research and technical reserves. In general, however, research in this field is still weak in fundamental

aspects

Reviewing the applications in 2005 in biomechanics and biorheology, there are comparatively good bases and groups and higher quality proposals, but most of the excellent proposals are limited within a few institutions and laboratories. In recently years, there is a crosscutting between biomechanics and information sciences, and it is developing to the direction of synthesized research of multi-level with cell, tissue, organ and the whole individuals, which is in accordance with the international tendency. Both the quantity and quality of proposals in artificial organ and biological materials have been improved to some extent, and the quality of proposals in tissue engineering in the aspects of bone, cartilage and blood vessel are also improved. Proposals in biomedical signal processing, biomedical measurement, biological sensors and biomedical image acquisition and treatment have increased to some extent, and the quality has been improved as well; of which, proposals in biomedical image are increased notably, chiefly concentrating on CT, MRI, spectrum and molecular imaging fields. Some of these fields are the hot points or the frontiers internationally. Proposals of nuclear medicine are increased obviously compared to those in the previous year, and the quality is improved as well, but with the absence of many outstanding ones. There is a big increase in medical imaging and radiology. Proposals for Free Application alone reached 305, as compared to 183 in 2004, with an increase of 66.6%. Research is mostly concentrated on medical imaging, especially in molecular imaging and imaging of brain function. Although the number of high quality projects has increased, the overall innovation remains comparatively weak.

The funding scope of the Division covers biomedical engineering, medical imaging and radiology. The Division will continue to encourage researches on the combination of biomechanics, biorheology and other research areas, emphasizing the coupling of mechanics and biology (chemistry) and micro-gravity's impact on organisms, and researches on artificial organs, to support research of new biological materials, organizational engineering, the superficial modifications of biological materials, biological compatibility, and the appraisal of the safety of biological materials. The Division will pay attention to the study of bionics, research on the extracting and integration of concealed signals in biomedicine, the non-invasive, real-time and dynamic measurements and transduction techniques, particularly the modeling and simulation of bio-system and the computer aided operation design. It will stress research on new concepts and methods of digital medical equipment and the innovative acquiring, treating and analyzing techniques for medical imaging, particularly the new methods in MRI/MRS, PET, spectrum and molecular imaging and their functions in disease diagnosis and therapy.

Division V of Life Science

The Division supports applications related to basic research on agriculture, including the science of basic agriculture, crop breeding, plant nutrition, plant conservation, gardening, storage process of crop production and food safety.

Currently, the development of agricultural science shows the following features: 1. while crosscutting with molecular biology and ecology, research in agronomy is extending from that at organism level towards both macro- and micro-levels; 2. the combination of biotechnology, information technology and many other technologies with conventional methods used in agricultural science has enabled the technical approaches in agricultural science to be increasingly updated and improved; 3. multidisciplinary research at various levels on biodiversity of crop resources, genetic improvement of crops and the interactions between pathogens and their hosts has enhanced the efficiency of agricultural resources and realized the tactic of agricultural sustainable development of "less investment, more output and environmental protection", which is becoming a hotspot in this discipline. For basic research in agricultural science, much attention should be paid to synthesizing the production ability of agriculture, ensuring food safety supply and sustainable development of agriculture, and providing theories, methodologies and technical update for land resources, the efficient utilization of water and nutrition, the cultivation of new crop varieties, the control of disease, insects and weeds, and for the production of desirable and safe agricultural products or materials. Special attention should be devoted to addressing the environmental issues.

In recent years, the number of applications received in agricultural science has been increasing gradually, 1,857 in 2005 which is 14.4% more than that in 2004, the funding rate of projects of Free Application, Young Scientists Fund and Fund for Less Developed Regions (not including the Small-Fund Exploratory projects) is 16.34%, 14.86% and 14. 58% respectively, and the average funding intensity is 258,500 yuan, 248,300 yuan and 145,800 yuan, which are noticeable increases. The analysis of the proposals shows the following major problems: 1. a number of applications only follow the international hotspots, lacking their own creative ideas; 2. there are many applications using molecular biology methods as key techniques, but some of them are not connected closely with the practical problems of Chinese agricultural production; there are fewer proposals on the combination of modern biological techniques and traditional methods; 3. quite a number of projects, big in scale, broad in content and wide in coverage, are vaguely designed, lacking detailed research contents.

Along with the development of agriculture as well as the national demand on basic research for agricultural production, the preference in agriculture research should be given to both scientific and practical values, and to strengthening the support of basic research proposals rooting from practical agricultural production, to encouraging scientists, by combining the scientific development and the demand on agriculture in China, modern biological techniques and traditional methods, and laboratory work and field experiment, to make systematic and in-depth research on particular agricultural problems urgently needing solution, such as crop breed resources and hereditary improvement, the mechanisms of the formation and control of crop quality, the mechanisms of crop to non-biological adversity and resistance to adverse, the mechanisms of crop-soil interaction and the efficient utilization of water and fertility, the mechanisms of chief crop diseases and pest resistance, the relation between host and parasite, the establishment related biological problems, the traditional

agricultural approaches suiting Chinese situation, problems of farm produce safety, and the storage and process of fruits and vegetables after picking.

Basic research in agriculture science requires new and synthesized knowledge, methods and multi-disciplinary crosscutting so as to obtain theories, methods and techniques for the solution of practical production problems. The Division will provide support of high intensity to excellent multidisciplinary applications and attach importance to performance and ethics. Proposals with sound achievements obtained previously will get preferential consideration and support. Continuous support will be provided to those excellent projects that need years of accumulation to study the underlying laws after they successfully pass the evaluation.

Division VI of Life Science

The Division supports applications in animal husbandry and veterinary science and aquatic science and zoology.

Animal Husbandry and Veterinary Science and Aquatic Science

The funding scope of animal husbandry and veterinary science includes studies on the basic laws governing the product formation, disease occurrence, prevention and control of livestock, poultry, silkworm and bees. The primary trends of development in basic and applied basic research of animal husbandry and veterinary science have the following features: 1. important questions that should be resolved in the whole animal husbandry and veterinary science are those with the combination of the microcosmic (molecules, cells and tissues) and macrocosmic (individual, population and ecosystem) research; 2. further adaptation and development of the theory and techniques of genome, proteome and bioinformatics in animal husbandry and veterinary science; 3. further explanation on the molecule level to the mechanism of formation of some important traits; 4. basic research at molecular level on the process of occurrence of large epidemic diseases, and molecular basic research on the interaction between pathogeny and organism; 5. new subjects, directions and concepts such as molecule quantitative genetics, molecule immunology, molecule nutriology, ecotoxicology and programmed metabolize formalization, heredity breeding and so on, come to their appearance and development.

Applications received and projects funded in recent years have covered basically all the areas in this discipline, among which, applications in genetic breeding (13.43% of the total), animal nutriology (13.78%) and animal epidemiology (18.25%) have been not only large in number, but also prominent in research quality, indicated by the fact that quite a number of applicants have built up research with their own unique features. Analysis of the applications shows that apparent progress in either research topic selection or test designing, particularly in academic idea innovation has been made compared with the past. The drawbacks, however, are also obvious among the applications: 1. a large number of projects

are based on conservative concepts with few originated creative ideas due to the fact that applicants are used to following their own familiar research fields; 2. quite a lot of applications have a big and improper title and unrealistic research objectives, which are insufficient in the abstraction of academic problems, resulting in vague and general in content; 3. many applicants exaggerate their research significance, overestimate research results, indicating a fickleness in study; 4. research on epidemic diseases emphasizes much on pathogeny, ignores the interaction between pathogeny and the body and obviously insufficient in the basic immunology of important functions to the prevention and control of poultry diseases; 5. one-sided pursuit of new technique application, to arrange research tasks abide by new techniques, and only take rest on the general recording of observation, lacking deep essence scientific work and resulting in the waste of manpower and material resources.

In the years ahead, more attention will be paid to innovative interdisciplinary research and support to researches possibly leading to new discoveries. New ideas and new technologies will be enhanced, and a high value will be placed on non-consensus innovative projects with high risk which will be fully protected, and be supported continuously. It should be in an important position to the training of young scientists as the subject pilot. Funding to those will be intensified that apply advanced theories and technologies to the key problems in animal husbandry and veterinary science, such as molecular based research on fine quality product formation of cultured animals in our country, the protection biodiversity of forage germplasm resources and the resistance physiology research of fine forage, new theories and techniques related to milk industry, the infection mechanism and immunity of important pathogeny of livestock and zoonosis, to enhance basic study of important bacterial diseases and animal products safety. A special emphasis will be given to basic research on new issues arising from China's entry into WTO in husbandry and veterinary science.

Aquatic science is a comprehensive research area which deals with the growth, propagation and development of aquatic economic animals or plants and the relation of water area productivity with the environment. With the infiltration and application of modern biological techniques to aquatic industry, basic theoretical studies in aquatic science are developing towards either vertically depth or horizontally crosscutting with other relevant disciplines, and more and more attention has been paid to breeding aquatics and fishery ecology. At present, research has been conducted on the genetic basis of important traits (i.e. resistances and reproduction) of aquatic animals at molecular level, and the genome structure of some pathogen materials from major marine organisms, the mechanisms of pathogenicity and immunology. But, as far as the overall research standard is concerned, there still exists certain gap to be filled compared to that in advanced countries.

Proposals received and projects supported by the Division cover every domain in aquatic science, but those in basic aquaculture (29.10%), aquatic protection (22.56%) and aquiculture (7.69%) are not only large in number, but also have formed their own feature in some aspects. According to the peer review, although the innovativeness of the proposals are improved obviously, there still exist certain common problems: 1. some applicants just follow the research fields they are familiar with, which results in the conservativeness in

their academic thoughts and lack of original innovation; 2. some try to be innovative one-sidedly, their research topics are not consistent with the contents, the goals are too high and the scientific problems are not sufficiently expounded; 3. some just repeat or follow others' work, or purely play the game of the so called "new technique" which has nothing to do with the demand of aquatic science, resulting in the waste of funds and manpower. In recent years, the Division practices the preferential policy in favor of aquatic resources, aquacultural biology and nutriology of aquatic economic animals, and the processing and preservation of aquatic products.

The research fields encouraged in aquatic science include genetics and functional genome to the important economic traits of breeding variety, artificial breeding study of valuable aquacultural species, pathogenic transmission, pathogenesis of chief pathogen and immunological mechanism of the host, breeding influence to the aquatic environment, and enhanced basic research of aquatic products. The Division encourages international cooperation, exploration and innovation, as well as basic or applied basic research meeting the needs in China.

Zoology

Zoology is the discipline studying life phenomena and rules of activity in animal morphology, taxonomy, physiology, genetics, behavior and evolution. Accompanied by the appliance of new research methods and advanced techniques, especially the development of molecular biology, bioinformatics and animal clone techniques, the research on the rules of animal life and activity has been further deepened. The intercross and synchronization between disciplines have enriched the research on animal morphology, taxonomy, physiology and animal behavior. Animal phylogeny and evolution, animal behavior and adaptation mechanism to adversity have gradually become the hotspots. Research on animal taxonomy and zoogeography, genetics and ecology, and resource exploitation and preservation have deepened our understanding and knowledge on the biodiversity, ecosystem security and environment protection.

Analysis of the applications received in 2005 shows that taxonomy is still the leading area, with 106 applications, accounting for 34.6% of the total, followed by animal resource and conservation biology (65, 21.2%), animal genetics and evolution (51, 16.6%), and zoonomy (42, 13.7%). Applications in the above fields are not only large in quantity, but also have formed their research features in some aspects and acquired their position internationally. From the feedback of reviewers, it can be seen that there is an obvious improvement in the topic selection and project design, especially in the innovativeness of their scientific ideas. However, there are still some problems to be noticed: 1) a number of applications are based on conservative concepts with few creative ideas due to the fact that applicants are used to following their own familiar research routines; 2) quite a number of applications have a big and improper title and unrealistic research objectives. They are insufficient in the abstraction of academic problems, resulting in vague and general contents; 3) some do not have enough basis or necessity pre-accumulation; 4) research methods and technical

approaches are not explained sufficiently or clearly, which makes it difficult to judge whether the anticipated objectives could be realized or not.

In the future, the re-confirmation of the identification and classification to the known species as well as the appraisal and description to the unknown taxon and species are still the main research contents supported in classic taxonomy. The Division encourages studies on animal phylogenetics and evolution, phylogeography, comparative physiology, comparative genome, organ development, the basic cytology of stem cell formation, the establishment of peculiar model animals, etc. Strengthening researches on biodiversity, conservation biology of endangered animals, sustainable utilization of important resource animals and control of harmful and alien species will be encouraged in view of their relations to the country's biological resource protection and utilization and bio-security, but resources should be used reasonably and intellectual property be protected during the research. The basic zoological research on specific species in China and areas of fragility basis needs to be encouraged continually.

The Division encourages innovation, especially theoretical and methodological exploration and research made according to the animal resources and regional features in China, with the application of new techniques and means. Interdisciplinary studies supported by different divisions and departments will be encouraged and innovative projects be supported continuously with higher intensity.

Division VII of Life Science

The Division is composed of two sections: human physiology and pathology, and preventive medicine. The funding scope of human physiology and pathology covers studies of human physiology, human pathological physiology, pathology, sports medicine and internal medicine, and preventive medicine deals with various types of research related to preventive medicine.

Human Physiology and Pathology

The research scope of human physiology and pathology covers the functional studies of tissues, organs, cells and molecules of normal human body, and the etiology, pathogenesis and prognosis mechanism of diseases. The progress in the functional genome and proteomics, as well as the wide disciplinary intersection and infiltration, has provided unprecedented opportunities and challenges. In recent years, the number of applications in human physiology and pathology has increased consistently, and the quality of projects supported also enjoys marked improvement. In 2005, 2,425 applications for General Program projects were submitted, an increase of 34.5% (622) compared to that (1,803) in the previous year. From the applications received and projects supported, it can be seen that the number of applications in human physiology has not changed much, but the overall

quality is pretty high and the success rate is also high. Applications in pathology focus mainly on tumor pathology and related fields, and that in stem cell research of tumor begin to increase. Applications on experimental pathology, involving the application of new technologies and methods in pathological researches, have also increased. Applications in the basic research on internal medicine also sees a continued growth, chiefly focusing on the basic studies of pathogenesis, diagnoses and therapy of common ailment and frequently-occurring diseases and broadly referring to various scientific problems. Among which, applications have increased about 55%-75% in lung cancer and alimentary canal tumor. Studies of hypertension, arteriosclerosis, arrhythmia, lung injury and pulmonary fibrosis, asthma, diabetes and chronic undercurrent diseases are still the emphasis of research. Attention has been gradually given to studies using China's unique resources, including hereditary pedigree, and progress has been made. New molecular biological techniques and model animals of gene engineering have been used in conformity to the research work. Although there are still a large number of applications in ion channels and diseases, signal transduction, gene expression regulation relating to diseases and gene therapy and in the function mechanism of biological regulation molecular, systematic and continuous research is insufficient and the development of different disciplines is imbalanced. For example, applications in digestive system mainly concentrate on tumors of digestive system, whereas basic research is weak in digestive physiology and other disease related studies. Stem cell research concerning ailment arises is becoming a new hotspot.

Analysis of applications in recently years shows the following problems: 1) The introducing, transplanting and tracking researches still occupy a large proportion. 2) Some scientists do not pay enough attention to the accumulation of research, their selection of topics is often tracking the hotspot so that they cannot form their own characters and do not have original ideas, and there lacks continuity and systematic work. 3) The application of new techniques is carried out one-sidedly, and there lacks scientific hypothesis and deep exploration of pathology mechanisms. 4) Interdisciplinary and cross-domain researches are insufficient and early stage accumulation and pre-experiments are not stressed, resulting in some of the proposed assumptions and hypothesis only based on the literature seeking and deduction. 5) Some proposals are unable to refine scientific problems, their contents are too wide and research plans too huge. 6) Some applicants could not use modern molecular biological techniques correctly, making the research methods merely a compilation of new techniques of molecular biology, while failing to take care of the suitability between the research contents and methods to be used. The Division encourages the applicants to better refine scientific problems, put forward their own academic thoughts and use the most suitable methods in the relevant study instead of seeking blindly the utilization of new and high techniques.

The Division advocates strongly original innovative thoughts, practical research schemes based on these thoughts and in-depth researches. It especially encourages researchers to do long-term and systematic research on certain important scientific questions, and to form gradually their own features. Continuous and higher support will be provided to applications for in-depth research dealing with new problems and hypotheses based on previous work. The Division will strengthen its support for the functional physiology of normal tissues

and cells of human body, important diseases and the etiology, pathogenesis, prognosis mechanism of common diseases experiencing obvious increase in occurrence, and pay attention to researches which deal with the practical situation in China and make good use of the advantages of China's unique resources, especially the pathogenesis study by using pedigree. The Division will pay attention to the research on functional diseases, stem cell related to diseases occurrence, and the differentiation of stem cells. While strengthening research at molecular level, integrating researches at the individual, organ, tissue and cell levels will not be neglected, and importance will be attached to researches featured by the combination of macroscopic and microscopic studies, combination of the morphology and functional studies, and combination of experiment and clinical practice. The Division encourages multidisciplinary research, integrated research related to human physiological function and pathological mechanism, and applied research aiming at the transition from basic research achievements to clinical practice.

Preventive Medicine

In 2005, 1,378 applications for General Program projects were submitted in preventive medicine, which is an increase of 27.4% compared to that in 2004. The average funding rate is 15.46%, and the average funding intensity is 245,000 yuan per project. In recent years, the number of applications in preventive medicine enjoys a gradual increase, the extensive disciplinary crosscutting and infiltration and the unceasingly emergence of new techniques and methods have provided a vast developing space for preventive medicine. The applications increase rapidly in the research on genomes, functional genomes and proteomes of important infectious pathogeny in China, research on the interaction between pathogeny and the host, epidemic law and prevention, research on the interaction of environment and hereditary factors in the occurrence, development and prognosis of diseases, research on the relation between nutrition, environment and diseases, and the resource collection of important genetically related diseases and relevant gene research. This increase reflects the hotspots and developing tendency in preventive medicine, and some researches represent the superiority and features in China.

The Division suggests that the selection of research topics should be based on the practice of preventive medicine and the actual needs to develop disease control and prevention strategy and new control and treatment tools. Special attention should be given to proposals with indigenous innovation to explore new theories, methods and technologies for disease prevention and control. On-site population studies should be combined closely with laboratory studies, new disciplinary growth points be stressed and foresighted researches be carried out with Chinese characteristics which can hold a seat in the world. According to the real needs of the national health care, it is important to emphasize population based research, make proper use of new technologies in modern molecular biology and immunology, and pay attention to disciplinary crosscutting and multidisciplinary studies. Continuous support will be provided to carry out basic research on important infectious diseases, parasitic diseases, endemic diseases, chronic diseases, occupational diseases and other diseases related to our life style, the general functions and mechanisms performed by

the environment, heredity and social psychological factors to the occurrence of important diseases, basic research on the influence of main chemical substances and environmental factors upon the health of the population, population's contagiousness and basic three-level prevention, the relations of dietary constitution, dietary ingredients and food hygienic quality to human health, epidemiological research on the venereal diseases and prevention, as well as theoretical and methodological studies of hygienic statistics. The Division also encourages international cooperation, correlative research on important diseases endangering people's health, and investigation and studies on the population epidemiological fundamental data, which is urgently needed in China's health care.

Division VIII of Life Science

The Division VIII of Life Science is composed of two sections: basic clinical medicine I and basic clinical medicine II.

Basic Clinical Medicine I

The funding scope covers basic diagnosis and therapeutics, surgery and its subjects, gerontology and rehabilitative medicine. Basis diagnosis and therapeutics mainly concern about basic research of laboratory medicine, physical diagnoses and therapy to reflect the application of hematology, immunology, microbiology, biochemistry and molecular biology in disease diagnosis and the development in laboratory medicine, to reflect the development and utilization of supersonic, microwave and other new techniques and methods of physical diagnosis, and imaging medicine in disease diagnosis and therapy. Applications in surgery and its subdisciplines are large in number and increasing rapidly, covering anesthesiology and resuscitation, burn wounds, trauma and repair (including tissue engineering and stem-cell engineering), tumor and malformation, etc. Among the applications, research on gene function closely related to disease and wound, protecnotics, gene therapy and stem cell takes a rather large proportion which indicates the broad infiltration of basic medicinal theory and methods of molecular biology and cell biology to surgery and its various subdisciplines. The tendency of population aging and early occurrence of aged degenerative diseases have made gerontology a hotspot in medicinal research. The orientation of development in the Division is to sieve, identify and examine new susceptibility genes and special susceptibility genes within the Chinese population, to study the expression and control of important aging related genes, to support the studies of important aged degenerative diseases, to explore disease characters of high aged population, and to improve the life quality of the aged group. The application of cell biology, molecular genetics, immunology, tissue engineering and biomedical engineering techniques has greatly accelerated the development of rehabilitative medicine and much progress has been made in wound epidemics, wound emergency treatment, shock, infection and immunization, multiple organ function failure and burn, and injury. It is the development tendency of modern medicine to continue the basic research on wound and repair and to use the therapic model of "repair without wound" to replace the traditional "repair wound with wound".

Basic Clinical Medicine II

The funding scope in this area covers obstetrics and gynecology, family planning of birth control, pediatrics, ophthalmology, rhinolaryngology, oral cavity science, oncology, special medicine and forensic medicine. Basic research on human reproduction, health reproduction, population quantity control and quality improvement becomes the chief point in this field. Malignancy of women and children, incretion diseases, other common diseases and important diseases are still the main research targets, and it is the imminent task to carry out etiology and molecular epidemiology in great scale, to explore the pathogenesis and to undergo early diagnosis and prevention in obstetrics, gynecology and pediatrics. The Division encourages molecular research on the prevention, early diagnosis and therapy of important congenital malformation, and diseases of inherit metabolize. Applications in ophthalmology mainly concentrate in the pathological changes of retina due to various reasons, the production of optic nerve of glaucoma, the immune tolerance of cornea transplants, the cataract, myopia, artificial replacement of optic organs and disease gene of pedigree, while there are less applications in artificial cornea, dry eye and the regeneration and infection of artificial vision. Research on upper airway allergic diseases, functions and obstacles of smell/hear, malignancy of rhinapharynx, and obstructive sleep apnea syndrome (OSAS) and so forth will still be the important points of otolaryngology, and basic research exploring the pathogeny and innovative method of therapy is the developing trend. In recent years, researches on oral cavity science chiefly concentrate on using current molecular biology, cell biology, tissue engineering and proteomics methods to study the common diseases of oral cavity, and the pathogeny, prevention and cure of tumor of oral and maxillofacial region, with more studies on the healing of soft and hard tissue injury of mouth, tooth growth and development, and its regenesis, covering various areas of oral cavity science. The jeopardy of malignancy and the complexity of pathogenesis have made oncology the key part of medicine at all the time, and also one of the subjects that has most proposals and increases most rapidly. Basic research on the exploration of pathogenic factors and pathogenesis, early diagnosis, early-warning, prevention and individualized remedy, and the forecast and prevention of metastasis and recurrence is the priority area. Special medicine and forensic medicine are the relatively weak subjects due to their speciality, but the unceasing penetration of new techniques and methods in medical studies has greatly facilitated its development.

In 2005, the Division received 4,721 applications for General Program projects, an increase of 36% compared to that in 2004. Although most applications possess certain scientific values, reflect the superiority and characters of related fields, there exist common problems like big research titles and the faddy phenomena of blindly tracing the international hotspots and new technical methods. Therefore, innovative ideas, rationality and feasibility of the applications are the key factors for them to be successfully supported. The Division encourages clinical medical researchers to identify and bring forward problems from clinical practice, refine out scientific hypothesis and carry out exploratory basic research and innovative research which can be transferred to clinical practice as well as cooperation with related basic researchers. Applicants should pay attention to China's concrete

conditions, try to make full use of our resource superiority and conduct long-term and in-depth studies on the basis of early research accumulation so as to gradually form their own research features. The Division encourages interdisciplinary researches combining microcosmic and macroscopic studies and the form and function studies, basic research of clinical medicine having extensive interaction and penetration with different disciplines, and researches to reveal the pathogenesis from molecular, cell, organ and individual levels and their affiliation.

Division IX of Life Science

The Division covers materia medica and pharmacology, and traditional Chinese medicine (TCM) and Chinese materia medica (CMM).

Materia Medica and Pharmacology

From applications received in recent years it can be seen that obvious progress has been made for materia medica research in China. One major progress is aiming at the pathogenesis of main diseases by applying important theories, ideas and approaches in molecular biology, cytobiology, genetics and biochemistry to discover and determine disease-oriented new drug targets and the possible intervening links; the other one is by making use of new research advances in bioinformatics, computer science, chemistry and materials science to develop new approaches and techniques for drug studies.

In 2005, 1,001 applications of different types were received, an increase of 35% compared to that in 2004, among which, 641 were for Free Application projects and 207 for Young Scientists Fund. The success rate for General Program projects is 16.5%. In pharmacology, applications on anti-tumor, cardiovascular and nerve energetic system medicines rank the first three, accounting altogether for 62% of the total. There is an obvious increase in the branch disciplines of immunology and clinical pharmacology. The pharmacology applications mostly center on the functional mechanism of certain drugs, which are basically tracking researches in their basic thoughts, but there are also some applications that have formed their own features on the basis of long-term study. In materia medica, applications for pharmaceutics and natural product chemistry take a large proportion, accounting for 33% and 32% of the total, respectively. Research related to antibiotics and biomedicine increases rapidly, accounting for 13%. Although there are quite a number of applications in natural product chemistry and pharmaceutics, their research ideas need to be expanded, and attention should be paid to the cooperation with biomedical researchers. About 8% of the applications was screened out due to the ineligibility during format examination. Except a few applications with well-selected topics which were not supported because of the insufficiency of data and materials provided or because of the oversized plan and equivocal aim, many were not financed due to the fact that their research topics are not obviously innovative, or the applications are too simple, or they do not have enough previous research

basis, and some proposals do not belong to the funding scope of NSFC for their research contents.

Basic research and continuous in-depth research will still be the preferential areas to be supported in the future. Applicants are encouraged to conduct multidisciplinary cooperation and interdisciplinary researches, and to focus, with creative academic thoughts, on the pathogenesis mechanism of important diseases in China, new drug targets, drug function mechanism, new types of leading compounds, new drug design ideas and new approaches, and basic research on clinical pharmacology. Appropriate support will be given to the distinctive study of Me-too drugs. The funding scope does not cover the conventional research and pharmaceutical craft research aiming at license application for new drugs. In 2006, the Division will strengthen its support to key problems in integrated functional mechanisms of active components of natural medicine, drug resistance and biological medicine. The protection of intellectual property rights in the study of materia medica and pharmacology is very important, and applicants should deal with this issue properly

Traditional Chinese Medicine and Chinese Materia Medica

This section consists of three disciplines, namely traditional Chinese medicine (TCM), Chinese materia medica (CMM) and the combination of TCM with western medicine.. The future trends of TCM and CMM development are as follows:

1. Based on the inheritance and development of TCM and CMM, the innovation of academic thoughts is advocated, modern theories and techniques from frontier areas in modern science are introduced and utilized, and multidisciplinary crosscutting and interpenetration are stressed;
2. Researches on the mechanism underlying the holistic activities of human life and their integer regulation are valued by the combination of macro and micro studies, and of colligative studies with analysis;
3. In-depth researches at different levels of organism, system, organ, cellular and molecular perspectives are stressed with the guidance ofTCM and CMM theories and taking clinical practices as the basis;
4. Basic researches in infra-health prevention and therapy by TCM and CMM approaches are being valued;
5. Researches on the matching laws, chemistry, pharmacology, sustainable utilization of CMM resources, quality control of CMM and CMM preparation, the relation between toxicant and efficacy of CMM as well as basic research on Chinese drug processing, FDC (fixed dose combination) and the theory of TCDE (traditional Chinese drug effects) remain to be the hotspots£ª
6. The scientific principles of non-linear complex adaptive system and the research methodology are valued gradually and applied increasingly in basic research, promoting the development of TCM and CMM.

In 2005, the number of applications reached 1,968 (1,915 for General Program projects, which is an increase of 32% compared to that in 2004). Although the overall academic quality has been improved to some extent, but the development among different branches is imbalanced, and some proposals still repeat others' work at lower level. Applications in CMM pharmacology reached 365, clinical basis for the combination of TCM with western medicine 236, chemistry of CMM 173, basic theory of the combination of TCM with western medicine 139, and internal medicine of TCM and acupuncture of TCM 135, respectively, ranking the first 6 branches and accounting for 61% of the total General Program applications. Applications in such sub-areas as TCM pediatrics, oral cavity studies, otolaryngology, Chinese Tuina-Anmo and Chinese health-care and healing are obviously less, and need to be further enhanced. A comprehensive analysis of applications in 2005 shows the main problems as follows:

1. Insufficient and deviated understanding towards TCM theories;
2. Insufficient innovation and original research on the CMM academic ideology, lack of TCM features, and improper tendency of unilaterally overstressing new technologies and new technical criteria;
3. Failing to bring forward key scientific problems and lack of relevant prophase bases;
4. Vague research targets, too much contents, impreciseness of experimental design and weak feasibility of technical approaches;
5. About 8.1% proposals were refused during format examination due to failures like more applications than allowed, imperfection of formalities, research areas not supported by the Division, application without specific prescription or acupoint, etc. Therefore, the scientificity, creativity (especially creative academic ideas), rationality, austerity and research background of the application directly affect its feasibility and approbation.

Multidisciplinary studies are encouraged to facilitate the succession and development of TCM theories as well as the penetration of TCM theories and thoughts into other modern sciences. While paying attention to the disciplinary intersection, the application of modern science and technologies and the effective integration with the real characteristics of TCM are highly stressed to overcome the problems of blind and unreasonable employment of high technologies. Research with innovative academic ideas and research which promotes the disciplinary development are the key points for NSFC in funding. According to the development trend of contemporary TCM research, the Division will pay more attention to the research in the scientific connotation of TCM and CMM theories in the following areas: basic research on the doctrine of viscera-state and in syndrome pathology (TCM), applied basic research and clinical efficacy evaluation on the prevention and treatment of critical or refractory diseases by TCM, basic research on disease prevention and treatment by Jingluo theory acupuncture, fundamental theoretical research in the combination of TCM with western medicine (chemistry of traditional medicine and pharmacology should apply from branches in chemistry and pharmacology of CMM respectively), basic research related to the sustainable exploration and utilization of CMM resources, basic research of TCDE (traditional Chinese drug effects) theory, basic research in the traditional prescription and formula and drugs related to syndrome, the material basis of dosage-efficacy (CMM), the functional mechanisms, and the relation of toxicant-efficacy and process inside the

body, basic research related to pharmaceutical techniques, innovative research in TCM and CMM, and creative methodological research in TCM and CMM. Cooperative research with multidisciplinary approaches is encouraged for transdisciplinary subjects, but attention should be paid to the combination with the theory of TCM and CMM.

Department of Earth Sciences

Earth science is one of the fundamental sciences concerning the understanding, utilization and management of the Earth, the only habitat for human being. By studying the processes and evolution involved in the atmosphere, hydrosphere, lithosphere, biosphere and the solar-terrestrial-spatial relation as well as their interactions, earth science aims to enhance our understanding of and extend our knowledge about the Earth. These studies will in turn provide a scientific basis and technological support for solving the problems associated with resources, environment and natural disasters encountered by the sustainable development of the human societies.

At the beginning of the 21st century, earth science shows the following features:

1. The Earth is considered as a whole complex system and interdisciplinary study will be intensified. High technologies are intensively explored and extensively applied. Social and economic functions will be further addressed.
2. The earth processes are emphasized on a variety of temporal- and spatial-scales. Quantitative observation and exploration, laboratory simulation and approaches from the earth's dynamics will be closely connected.
3. Endeavors will be made on a better understanding of the primary processes and changes occurred in the individual spherical layers of the earth system, their interactions and anthropogenic influence upon these layers, seeking a harmonic relation between human and the nature. The Earth as an integrated system becomes a major rationale of study.
4. The understanding of the primary earth-processes and interactions between various spheres of the Earth will be used to solve the basic problems associated with resources, energy, environment, ecology, disasters and earth information systems for a sustainable development of human societies.
5. Under the above circumstances, new frontiers of earth science will involve global change and earth system, earth environment and life processes, mechanical dynamics of weather and climate system, continental dynamics, regional sustainability, solar-terrestrial spatial environment and space weather, and the development of new exploration methodologies and technologies.
6. Computer modeling, trans-sphere tracers and information network covering the entire globe are critical tools for modern research, and the globalization characterizes the scientific advance in the new century. Knowledge and information resources of the whole world will be a public platform of internationalized scientific activities.

In 2005, the Department received 3,654 proposals for General Program projects. Among them, 2,718 were for Free Application projects and 646 got funded, with a success rate of 23.77% and a total funding of 228.34 million yuan; 800 proposals for Young Scientists Fund and 214 were funded, with a success rate of 26.75% and a total funding of 57.97 million yuan; 136 proposals for the Fund for Less Developed Regions and 21 were funded, with a success rate of 15.44% and a total funding of 4.7 million yuan. For Key Program, 132 proposals were received and 34 were funded, with a total funding of 47.25 million

yuan. Out of the 143 proposals for the National Science Fund for Distinguished Young Scholars (including applicants with foreign citizenships), 18 were funded, with a total funding of 18 million yuan. For the Joint Research Fund for Overseas Chinese Young Scholars and Joint Research Fund for Hong Kong and Macao Young Scholars, 39 proposals were received and 7 were funded, with a total funding of 2.8 million yuan. There were also nine applications for the Creative Research Groups and three were funded, with a total funding of 10.8 million yuan. There were 95 proposals for the Major Research Plan and 19 were funded, with a total funding of 18.53 million yuan.

Among the General Program projects in 2005, universities and research institutes undertook 451 and 416 projects respectively, accounting for 51.19% and 47.22%, respectively. The principal investigators of 688 projects were under 45 years old, accounting for 78.1% of the total. Continuous funding was given to 269 projects, accounting for 30.53% of the total. There were 81 interdepartmental and interdisciplinary projects. The number of the interdisciplinary projects supported by different divisions of the Department was even higher.

As a continuing effort to encourage the exploration of highly innovative basic research studies, particularly non-consensus projects with innovative ideas, the feasible, operative and protective measures have been taken, which might reinforce the intensity of support of approved projects and trigger to improve the general research quality of earth sciences in China. In 2005, 15 non-consensus projects funded were recommended by individual panel members. In the meantime, the Small Fund for Exploratory Studies with a term of 1 year was set up for highly exploratory, innovative and highly risky projects or projects with uncertainty. Altogether, 51 proposals were approved as the Small Fund projects in 2005, with a total funding of 5.1 million yuan.

The criteria for the selection of General Program projects in 2006 are as follows: 1) innovation and academic value of the overall research approach (Exigencies will not be placed on innovative projects in the early stage); 2) the ability and potentiality of the applicants; 3) rationality, thoroughness and feasibility; 4) the availability of necessary research basis and conditions. While encouraging innovation for basic research, stress will also be placed on the accumulation of previous studies. Under the same condition, preferential support will be given to those applicants who have good accumulation of previous studies and accomplishments of high-quality obtained in their recently completed projects and who apply to continue their studies. Applicants are required to address the relation between the proposed research work and their accomplished project. Because cutting edge science and interdisciplinary projects have become the fertile soil for innovative ideas and indigenous innovation, special care should be provided to those applications of interdisciplinary studies during the selection of projects. The trend of globalization of basic research is becoming more and more apparent. By acquiring and sharing research results and experience of international scientific community and using the research means, apparatus and information of developed countries, it would be most likely for our research to reach the international advanced level at the earliest possible time. Therefore, applications with international collaborative background, particularly those participating in the international

science research plans, will be given a high focus. We will gradually introduce and create the honest style of study, and encourage excelsior research style in the project application through the proposal evaluation.

One of the important targets of NSFC is to train and cultivate continuously and steadily a big contingent of distinguished young scientists. Support to the applications of young scientists, especially distinguished young scientists, will be highly addressed. The main function of the Young Scientists Fund is "seedling raising", that is, to provide more opportunities to those young scholars who just start their research career so that they can grow up more quickly. As young scientists under 45-years old have become the main body for the implementation of General Program projects, the funding for Young Scientists Fund will focus on younger scientists, particularly post-doctorates and fresh Ph.D. obtainers.

Listed in the following table are numbers of projects granted and successful rates in the Department of Earth Sciences and individual scientific divisions in 2004 and 2005. In 2006, the funding for each project will be raised reasonably, while the successful rates will be remained.

Funding for Free Application Projects in Recent Years

Unit: 10,000 yuan

Scientific Division		FY 2004			FY 2005		
		Projects granted	**Funds**	**Rate(%)**	**Projects granted**	**Funds**	**Rate(%)**
Division I	Geography (including soil science and remote sensing)	208+5*	6,274	18.47	247+18*	8,340	19.53
Division II	Geology	172+16*	5,802	26.52	201+9*	7,339	28.11
	Geochemistry	68+3*	2,161	27.31	80+4*	2,828	27.10
Division III	Geophysics and space physics	80+6*	2,655	25.52	100+6*	3,602	28.80
Division IV	Marine science	88+6*	2,785	22.12	109+8*	3,796	26.77
Division V	Atmospheric science	73+6*	2,276	21.76	93+6*	3,196	22.76
Total or support rate		689+42*	21,953	22.51	830+51*	29,101	24.11
Average amount per project		30.03(31.25**)			30.03 (34.45**)		

Notes: * Small Fund projects for 1 year.

** Average amount for individual projects with a term of 3 years (not including Small Fund projects)

Division I of Earth Science

The funding areas of the Division include physical geography, human geography, pedology, remote sensing and GIS, and environmental geography.

Geography (including pedology, remote sensing and GIS) is a comprehensive discipline, aiming to the understanding of the developing processes, the spatial/temporal heterogeneity and especially the interaction of human and natural environment on the earth's surface. In recent years, with the rapid development of the branches in geography, the research areas of traditional geography have become deeper and wider. In the recent two years, some progress in physical geography was made in the field of Land Use/Cover Change (LUCC) in typical regions, physical based distributed ecohydrological models on small watershed scale supported by GIS, the simulation of the palaeogeomorphological evolution and sea-land relationship in Yangtze Delta since 10,000 a BP, and the mathematical-mechanical modeling of the aeriform-liquid-solid triphase transfer in tunnels in cold regions, and so on. In human geography, some progress has been made in the measuring methods and spatial analysis of urbanization, behavioral geographical methodology on urban consumer behavior in China, the regional effects of behavior and cooperation of enterprises, convergence mechanism of regional economic growth in China, and the traditional human settlement landscape in South China. In soil science, some progress has been made in the mechanism and dynamic modeling of soil biological process, nutrient cycling and pollutant degradation, the forming process and environmental effect of soil minerals, such as Fe_2O_3, MnO_2, soil erosion by rainfall, and transfer of nutrients, such as N and P, from soil to water, and the spatial-temporal distribution of soil quality and soil nutrients. In remote sensing and GIS, some progress has been made in precise identification with hyperspectral remote sensing data, improving search speed under remote sensing data with high spatial resolution, physical based remote sensing inverse model based on vegetation actual structure knowledge base, new method for error distribution of spatial data, and block adjustment with new geometric model, correlation of traditional azimuth parameter in high spatial resolution remote sensing data. In environmental geography, some progress has been obtained in studying the environmental-chemical behaviors and remediation of heavy-metal-contaminated soil, the speciation of the metals in plant-soil-water system and the bioavailability within the rhizosphere, the effects of methane oxidation on soil carbon sequestration of forest soil and its microbiological mechanism, and the proxies and significant events of environmental evolution.

In 2005, the Division received 1,357 applications for General Program projects, among which 946 were for Free Application, 320 for Young Scientists Fund, and 91 for the Fund for Less Developed Regions. A total funding of 83.40 million yuan was finally financed to 265 General Program projects. Among them, 173 are Free Application projects with a total funding of 58.97 million yuan, 79 Young Scientists Fund projects with 21.44 million yuan, and 13 for Fund for Less Developed Regions with 2.99 million yuan. As for the fields, 62 projects were supported in physical geography with a total funding of 20.72 million yuan, 27 in human geography with 7.85 million yuan, 47 in soil science with 16.14 million yuan,

64 in the field of remote sensing and GIS with 18.03 million yuan, and 65 in the fields of environment geography and regional sustainable development with 20.66 million yuan. Besides the above-mentioned projects of General Program, the Division, according to the principle of encouraging innovation and the nomination of panel members, also funded two non-consensus projects with a total funding of 740 thousand yuan, and 18 projects for Small Fund for Exploratory Studies with 1.8 million yuan. In addition, 2 projects with 800 thousand yuan were funded in the field of health science.

For a certain period of time in the future, the Division will continue to support projects both in basic and applied researches in geography (including pedology, remote sensing and GIS), aiming at the national requirements and regional specificity of China. Emphasis will be given to regional-scaled comprehensive projects with great innovation or new technologies/methods, and to the researches on the mechanism of structural/functional change of the earth's surface system under the effects of human activities, and on the ways for regional sustainable development. The funding for General Program projects may be increased according to their importance and application prospects.

Division II of Earth Science

The funding areas of the Division include geology, geochemistry and environmental geology.

Geology (including environmental geology)

Geology (including environmental geology) studies the composition, structure and evolution of the Earth so as to understand its past, present and future. The task of modern geology is not only to elucidate the materials that construct the Earth, the mechanism controlling the transition of matters and the history of geo-evolution recorded by these matters, but also to reveal the agents and processes which change the surface of the Earth. Our knowledge of geology can also be useful for the society to explore and utilize energy, water and mineral resources and to understand the relationship between geological processes and human community.

The introduction of plate tectonic theory has brought about revolutionary changes to our understanding of the Earth. Reasonable and comprehensive explanation to the seemingly isolated and puzzling geological processes and phenomena is successfully applied. The complexity of the continental dynamics is further raising new themes for the advancement of the plate tectonic theory. The development of mantle plume theory in the recent years has closely linked the deep activities and surface phenomena of the solid earth.

The development of modern science and technology has improved our ability for data acquisition. The advance of analytical precision for terrestrial materials has enhanced our ability to determine the composition and time for the Earth's specimen. The utilization of

seismological technology in chromatography imaging, and the remote sensing technology and satellite observation of the Earth and neighboring space objects have deepened our understanding of the structure of the Earth. GIS and GPS technologies have improved the quality of geological mapping and monitoring of plate motion, earthquake and volcanic activities. Computer simulation has made possible the analysis and predication of important geological processes. Crust drilling techniques and high-temperature and high-pressure experimental technologies have also greatly promoted the development of geology.

Population expansion is exerting a great impact on the Earth. Mineral resources consumed by human beings every year is 3 times of the land sediments transported to the sea by rivers. The rate of ground water extraction exceeds that of supply. Human activity may cause species extinction. As a kind of new geological agent, human activities closely link the terrestrial environment and human habitat together.

In the past decade, profound changes have taken place in the research subjects, models and methods of geological science owing to the emerging new framework of earth system science, the strong demand to serve social and economical sustainable development and the rapid development of space science, information technology and analysis technology of substances. The role of geology has evolved from its traditional function of disclosing the records of the Earth's history to the prediction of the Earth's future environment. New interdisciplinary fields are emerging due to the close correlations between geological science and life science.

In 2005, 747 proposals for General Program projects were received and 210 were funded (including 9 projects of Small Fund for Exploratory Studies), among them projects for Free Application, Young Scientists Fund and Region Fund are 178 (with a success rate of 28%), 31 (27%) and 1, respectively. The average funding for each project is 370 thousand yuan. The distribution pattern of the funded projects among main research fields is that projects in mineralogy, petrology and economic geology account for 23% of the total funds, projects in paleontology, stratigraphy and sedimentology for 20%, projects in structural geology and regional geology for 17%, projects in Quaternary geology and environmental geology for 15%, projects in hydrogeology and geo-engineering for about 16% and projects in petroleum geology and coal geology for 9%.

The predominant problems in the proposals in 2005 are that many failed to state the academic issues clearly, thus inducing the poor design of main objects and approaches of the research. In some proposals, the description of research methods and technological outlines are very general and there is a lack of essential feasibility on key approaches. In certain proposals, only students or overseas members are listed as co-PIs, and the stability of the research group is questioned.

Geochemistry

Tracing and dating of elements and isotopes are central parts of geochemistry, and their

progress has led the maturation of geochemistry in the theoretical framework and methodological system. Furthermore, the targets of geochemical studies have been shifted from single lithosphere to more spheres of the Earth, with emphasis on sources and processes. The interaction between geochemistry and other disciplines becomes more and more intensified. As a result, geochemistry is playing an increasingly important role in the Earth System Science.

Key points and application basis for the further and persistent development of geochemical subjects are to deepen and explore the fundamental principles of element and isotope tracing and dating, and to establish a number of important analytical and experimental techniques. The Division will continue to provide support to these aspects. Geochemical application is required not only to keep a foothold on the natural characteristics of China continent but also to focus on international science frontiers. Environmental and biological (organic) geochemistry has become a very active subject, of which more work on global change has concentrated on studies of "recording" rather than "mechanism" as compared with previous ones. In bio-geochemistry, emphasis should be placed on the dynamics of geochemical cycling and associated ecological effects of nutrient elements, trace gases and particulates, while attention should also be paid to the exposure level, health risk as well as the technical approaches for the assessment and remediation of the highly contaminated environment.

Chemical geodynamics has become one of the most competitive areas in the earth system science. Petro-geochemistry needs to select geological problems of prominent importance as subjects. In modern earth sciences, there have been more demands for short-lived radioactive geochronology and other young geochronology. Nevertheless, the problems in methodology still remain to be resolved in the geochronology of long-span radioactive isotopes. Metallogenetic geochemistry should pay more attentions to the comprehensive understanding of geodynamic settings during mineralizing processes. It is also encouraging to grant subjects concerning geochemical exploration of such ore deposits as hidden or difficult to distinguished ones. Experimental geochemistry has been listed as one of the encouraged funding areas, and the innovative ideas in experimental consideration and key scientific problems to be solved become the key factors which determine whether they could be funded or not. The exploration of various analytical technologies and experimental methodologies that may be directly applied to geochemical studies is encouraged in the funding policy. However, the transplantation and introduction of methodologies and technologies that are not of geochemical interest do not belong to the coverage of geochemical funding.

The Division plans to provide more support to the following studies: 1) the chemical structural and compositional heterogeneity within lithosphere, crust-mantle interaction and material cycling, mechanism of continental growth and reworking, assembly and breakup of continents and their environmental effects; 2) geochemical interaction and matter exchange between the deep and surface earth systems; 3) the formation and evolution of Monsoon in East Asia, the effect of geological processes on carbon cycle, the interaction between human activities and environmental changes; 4) geochemical processes and their

effects on the environment and biogeochemistry on the Earth's surface, the earth environments that control the origin, evolution and biodiversity of important creature biota; 5) fundamental studies concerning the exploration of metallogenesis and accumulation functions that may have the potential prospects of scientific application or the importance of basic theories.

In 2005, 310 project proposals in this field were received, and 84 were funded (including 4 projects for Small Fund for Exploratory Studies), with a funding ratio of 27.1%. 65 projects were funded within the framework of General Program (including 3 Small Fund for Exploratory Studies projects), with a funding ratio of 27.1%. 18 projects were funded by the Young Scientists Fund (1 Small Fund for Exploratory Studies project is included), with a funding ratio of 27.7%, and one was funded by the Fund for Less Developed Regions, with a funding ratio of 20.0%. Relatively stable funding is kept in recent years for a number of subdisciplines despite lots of proposals, including environmental geochemistry and biogeochemistry (a funding ratio of 19% in 142 proposals), geochemistry of mineral deposits, and petroleum and natural gas (40% in 41 proposals), isotope geochemistry (32% in 38 proposals), petro-geochemistry (35% in 26 proposals). The number of proposals in isotope geochronology is not big, but their quality is relatively high. The majority of proposals received in new geochemical technologies and methodologies are out of the support areas.

Major problems encountered in the proposals received are as follows: 1) some proposals only emphasize the importance of related research areas without concentrated analysis for research details and innovative ideas; 2) the targets are too high and difficult to achieve, which confuse the long-term targets with those that could be attained by the projects; 3) although some proposals have selected excellent research objects or contents, but are unable to extract focused scientific problems to solve; 4) although new techniques and methods are properly addressed in the proposals, and the scientific problems being studied in geology and environmental science are not explicitly expressed; 5) research technologies have only been outlined generally without sufficient description of specific methods for the problems to be solved and the feasibility of core and critical techniques.

Division III of Earth Science

The Division supports research in the following major fields: solid geophysics, applied geophysics, space physics and geodesy.

Owing to the wide application of GPS, INSAR and satellite gravity in the field of earth sciences, significant breakthroughs have been made in the research of geodesy. The precision of observation in geodesic survey has increased by 2 to 3 orders of magnitude in comparison with that in traditional geodesic survey. Thanks to the application of deep seismic reflection technology, information and new discoveries of earth sciences in the fine structure of crust and the top of up-mantle have been acquired from the reflection profile, which has enriched

the theory of this technology and the experience in its application. With the establishment of nonlinear seismic inversion theory and its application, the observation resolution has been highly improved and the features of very complicated tectonics have been brought to light accordingly. Long time accumulation of earthquake data and the improvement of research methods together with non-seismic methods have made it possible to study the deep structure and status of the Earth. Applied geophysics has made great contributions to the development of the national economy. Space physics has been developing rapidly over the years and a good deal of research achievements have been obtained in the transmission and coupling of energy in all layers and spheres of the space. The general theoretical framework in the disturbance of solar terrestrial system has basically taken shape, which has laid a solid foundation for the rapid development of space weather research and the provision of space weather service.

In recent years, the patterns of application and funding in the Division are basically unchanged. In 2005, 368 General Program proposals with a demand of 130.81 million yuan were received by the Division. They belong to 3 categories: 286 for Free Application which is an increase of 5.15% compared with that in the previous year, 78 were granted and the average funding per project is 378 thousand yuan; 76 for Young Scientists Fund which is an increase of 31% compared with that in 2004, 21 were granted and the average funding per project is 271 thousand yuan; 6 for the Fund for Less Developed Regions, 1 was granted with 230 thousand yuan. The disciplines like exploration geophysics, geodesy, seismology, space physics, geodynamics and deep earth geophysics had more applications, and geophysical instrumentation, gravity, space environment, geomagnetism, electromagnetism and geothermal research had few applications.

In the past few years, the Division has given its emphasis and preferential funding to proposals having creativity and good results. For a certain period of time in the future, creativity will be given the highest priority and fostering outstanding young scientists will have an important position. While strengthening basic theoretical research, priority will be given to in-depth studies, new research areas and creative and exploratory research projects, especially the potential breakthroughs in these areas, which have been long-term focus and difficult issues. Research will also be encouraged in space weather, satellite gravity, environmental geophysics, physics and dynamics of the Earth's interior, interdisciplinary studies between geophysics and planetary physics, experimental geophysics and seismological wave propagation theory. Attention will also be given to research on scientific issues in geophysics and space physics by applying new technologies and methodologies, and proposals for the utilization of observation data to understand the Earth will be encouraged.

Since it is impossible to predict scientific discovery, every proposal with new idea is sincerely welcome.

Division IV of Earth Science

The main funding areas of the Division are marine science and polar science

Marine Science

Marine science is a discipline concerning all kinds of natural phenomena, processes of the ocean and their changing rules. Its research objects include not only the colossal sea water but also the estuarine coastal areas, the interface between ocean and atmosphere, the interface between sea water and sediments as well as the lithosphere of seafloor. As the basis for marine science development, mathematics, mechanics, physics, chemistry and biology have been interpenetrating and intercrossing with marine science. New and high technologies, such as space technology, information technology, biotechnology and deep-diving technology, have been continuously applied to marine science. New frontier disciplinary areas formed in this way are also the funding areas in marine science. The research in this area will be the promoting force of marine science development.

Marine environment is an integral system in which various affecting factors exist simultaneously and interact with each other, it is necessary to carry out integrated research to solve the problems. The intercrossing between multi-disciplines and integrated research are the development trends of marine science nowadays. While strengthening the regionalization research, marine science has already developed towards the globalization and internationalization research. A series of influential international research plans on marine science have been formed in combination with hot and pressing issues such as climate change, resources, environment, etc. Therefore, extensive international cooperation is coming forth, impelling the fast and in-depth development of marine science. Additionally, the ability of acquiring data and information of field observation has greatly promoted due to the continual progress of marine exploration technology, indoor analysis technology and marine information process technology, which becomes one of the impetuses for the development of marine science today.

For the development of marine science in China, it is suggested that the importance should be attached to the intercrossing of different disciplines and special attention given to the interpenetration and integration among them. Research fields and directions to be emphatically supported recently are as follows: ocean circumfluence and climate change, offshore circumfluence and its dynamical mechanism, the paleo-global change of ocean and the comparison between land and sea, marine biogeochemical cycle, the coupling of marine ecosystem and biogeochemical processes, material flux and cycle between upper ocean and low atmosphere, land-sea interaction and estuary coastal zones, the oceanography and ecology of harmful red tide, the biosphere of deep ocean and the life processes in the extreme deep-ocean environment.

In 2005, 437 proposals for General Program projects on marine science were received by

the Division. Among them, 296 were in the fields of four sub-disciplines: physical oceanography, marine geology and geophysics, marine environmental science and marine biology, accounting for 67.7% of the total for General Program projects. 117 proposals were supported, and the funding ratio is 24.9% (excluding 8 for Small Fund for Exploratory Studies). Among them, the funding ratio for Free Application projects is 23.7% (excluding 8 for Small Fund for Exploratory Studies) and that for Young Scientists Fund is 27.8%. Similar to the past few years, there are still more proposals funded in the fields of the above-mentioned four sub-disciplines than in others.

The overall quality of applications in 2005 is evidently improved compared with that in the past, particularly in the selection of research orientation, project design and the completion of application forms. Although some proposals, especially those for Young Scientists Fund, do give a clear statement of the importance of the subject and national demand, they fail to point out whether what they proposed have been solved or not, what are still waiting to be studied, where is the key point, what the applicants are going to deal with, and how they are going to resolve these concrete issues. That is to say, there is a lack of explicit scientific issues.

Polar Science

Polar science is a discipline studying various special natural phenomena, processes and changing rules in polar region as well as the interactions with other regions of the earth. It is a comprehensive discipline composed of several sub-disciplines including polar biology and ecology, polar oceanography, polar space physics, polar atmosphere science and climatology, polar geology, geophysics and geochemistry, Antarctic astrolithology, polar glaciology, polar mapping and remote sensing science, polar management and information science, polar observation and engineering technology, etc.

In the past few years, great progress has been made in international polar research. However, it is still the weakest part in the earth system science. Aiming at the current key scientific issues on global change and sustainable development, the breaking boundary of traditional disciplines, integrated research on the features and interaction of the five spheres in polar region as well as their connection with every sphere in the middle or low latitude in a larger time-space scale have become the development trends in polar science nowadays.

For polar science in China, researches integrated with the existing work and in closely combination with key scientific issues such as global change and sustainable development are suggested. Research fields and directions to be emphatically supported recently are as follows: the processes and variation of the Southern Ocean, mechanisms of the Arctic Ocean and sea ice rapid-change as well as their climatic effect, geochemical processes in polar regions and biogeochemical cycle of carbon, climate and environmental changes of the Antarctic ice sheet, the response of environment evolvement on global change in ice-free polar region, the process of polar atmosphere and its relation with global change, polar environment and biodiversity, polar microbe germ palms and gene resources, polar

marine biological resources changes, dayside magnetosphere boundary layer and dynamic processes, Antarctic aeroliths and astro-dusk research, modern plate movements in Antarctic and sea level model of Antarctic Ocean, land measurement in polar as well as mountain-building during Pan-African period and the formation process of Gondwanaland in the East Antarctica.

In 2005, 16 proposals for General Program projects on polar science were received by the Division, involving polar biology and ecology, polar oceanography, polar atmospheric science and climatology, polar geology, geophysics and geochemistry. Seven were funded, including 3 for Free Application projects and 4 for Young Scientists Fund. The average funding ratio is 43.7%.

Division V of Earth Science

Research areas supported by the Division include meteorology, atmospheric physics, atmospheric environment and atmospheric chemistry.

Atmospheric science studies various kinds of natural phenomena occurring in the atmosphere and the laws underlying the mechanisms of variation so as to use these laws to serve the mankind.

In recent years, following the introduction of systems science and sphere interaction concepts of the Earth, atmospheric science enters into a new historical phase of development. The atmosphere is a very active sphere in the earth system. Its changes are adjusted and controlled by other spheres in the system and celestial bodies such as the sun, while the response of the atmosphere to the changes will result in simultaneously important and direct impact on the ocean, terrestrial surface, ice and snow and the ecosystem on the Earth. The atmosphere plays an important role in the interaction among different spheres of the earth system, and the interaction of the atmosphere with other spheres regulates the whole behavior of the earth system. Therefore, from the view point of the influence, interaction and feedback of the global climate with hydrosphere, lithosphere, cryosphere, biosphere and human activity, contemporary atmospheric science studies the nature of atmospheric movement and change, the variable rules of the weather, climate system and its prediction, regulating techniques and measures against local weather, impact of human activities on the weather, climate and natural environment, and the impact of change in the global climate and environment to human society.

Atmospheric science is developing towards the intercrossing and interpenetration of different disciplines from all directions. In addition to continually deepening the present research, the Division will pay more attention to research on the interaction in different spheres, synthesis and integration of various processes as well as the systematization and modeling, the linkage and integration of different methodologies such as the observation, analysis, theory, simulation and prediction, global climate and environment change and its impact,

prediction and compatibility, the optimization of human living environment and the regulation so as to provide a scientific basis for the sustainable development of mankind and the society.

In 2005, there were 435 applications for General Program, which is an increase of 19.8% than that in 2004. They include 317 for Free Application projects (which is an increase of 23.8% than that in 2004), 99 for Young Scientists Fund (an increase of 11.2%) and 19 for Regional Fund projects (an increase of 5.6%). Among the proposals, those for climatology, numerical weather prediction and numerical simulation atmospheric dynamics as well as atmospheric remote sensing hold the first places, accounting for 26.9%, 11.3% and 9.9% of the total, respectively.

In 2005, 99 projects were funded by the Division, including 63 for Free Application, with the success rate of 19.9% and an average intensity of 358.7 thousand yuan per project. In addition, there were six projects for Small Fund for Exploratory Studies and the average funding intensity is 100 thousand yuan per project, 27 projects for Young Scientists Fund (the success rate is 27.3% and the average intensity is 271.5 thousand yuan per project) and 3 for Less Developed Regions (the success rate is 15.8% and the average intensity is 230 thousand yuan per project). Among all the branches, the success rate is high in the fields of atmospheric boundary layer physics and atmospheric turbulence, atmospheric remote sounding and atmospheric exploration, atmospheric dynamics and atmospheric physics. It is worth to mention that the success rate for atmospheric chemistry and atmospheric environment was increased as almost the same as the average, while the success rate for climatology was slightly decreased than that in 2003.

The applicants in 2005 belong to 105 institutions (94 in 2004). The age of the applicants is younger than before, with 353 applicants under the age of 45, accounting for 75.9% of the total, and 258 applicants have their Ph.D. degrees, accounting for 55.5% of the total.

During the Eleventh Five-Year Plan period, the Division will continually encourage the study of various exploratory and creative issues, and the study of various unknown phenomena and issues occurred in the atmosphere by using latest research results and methods from the basic disciplines such as mathematics, physics, chemistry and biology as well as advanced equipment and technologies. The Division encourages applications related to atmospheric chemistry, atmospheric environment, atmospheric remote sensing and stratospheric processes research. The Division also encourages applications related to large-scaled scientific experiments currently conducted in China and key projects already funded in the priority research areas by the Department of Earth Sciences during the Eleventh Five-Year Plan period.

Department of Engineering and Materials Sciences

Engineering science and materials science are important fundamental branches and essential to the national security, the quality of human life, the social progress and the economical development. In the new century, engineering science and materials science are the key fields to incubate new and high technologies, promote the industrial development and enhance our comprehensive national strength. In order to ensure the harmonic development between human and the nature, to improve the environment for human survival and to raise the standard of people's life, many countries in the world have taken them as a major strategy to promote science and technology so as to achieve sustainable development. The progress in information technology, biotechnology, new materials, new energy resources and renewable energy resources, advanced manufacturing technology and technology in environment protection has paved effective ways for relieving resource shortage, preserving ecological balance, developing the national economy and protecting the environment in a harmonious way. Research on engineering science and materials science must aim at research frontiers, combine with the strategic demands of our social progress and economic development, and enhance the scientific creation and technological innovation, especially original innovation with our own intellectual property rights. We should focus on developing applied basic researches, such as materials science and engineering, manufacturing science and engineering, energy science and engineering, resources utilization and environment engineering, structure and civil engineering, and highlight interdisciplinary researches with information technology, life science, nano-science and technology, space science, disaster prevention and disaster control. The frontier exploration should be integrated with the guidance of national interests, and basic research combined with engineering practice, so as to promote scientific development, boost new and high technologies, accelerate the technology progress of industries, develop a healthy, wealthy, efficient and clean economical and social system, and enhance our international competitive capability and ability for sustainable development.

In 2005, the Department received 8,165 proposals for General Program (Free Application, Young Scientists Fund and Fund for Less Developed Regions) projects, 148 for Key Program projects, 236 for Fund for National Distinguished Young Scholars, 55 for Joint Research Fund for Overseas and Hong Kong, Macao Young Scholars, 14 for Creative Research Groups, 62 for Joint Research Funds (Joint Fund of NSFC and Baoshan Steel Complex), 30 for Joint Fund of NSFC and Hong Kong Research Grant Council, 32 for Joint Fund of NSFC and General Motor, and 11 for Special Fund of Scientific Instruments.

Amount the 8,165 proposals for General Program projects, 1,425 have been supported, with a total funding of 355.90 million yuan.

Funds and Projects for General Program Projects in 2005

Unit: 10,000 yuan

Scientific Division		Funds	Projects granted	Average amount per project	Rate (%)
Division I of Materials Science	Metallic materials	3,785	142	26.65	18.62
Division II of Materials Science	Inorganic materials Polymer materials	4,339 3,016	169 122	25.67 24.72	16.67 17.21
Division I of Engineering Science	Metallurgy and mining science	3,259	135	24.14	17.15
Division II of Engineering Science	Mechanical engineering	7,168	290	24.72	17.34
Division III of Engineering Science	Engineering thermophysics	3,443	140	24.59	19.05
Division IV of Engineering Science	Civil engineering and environment	5,605	221	25.36	16.03
Division V of Engineering Science	Electrical engineering Hydraulic science	2,245 2,730	96 110	23.38 24.82	19.63 17.41
Total		35,590	1425	24.97	17.42

In order to support the national strategy for the development of western China, the Department has also provided preferential support to projects closely related to the west, such as materials and engineering projects that are conducive to the ecological protection, and projects engaged in resource development and utilization, clean energy and research of hydro-science.

In order to carry out the general national policy of "economic construction must rely on science and technology, and science and technology must serve economic construction", to resolve key scientific and technological problems arising in the social and economical development, to promote the commercialization of scientific achievements, NSFC has established the Joint Fund for Steel Research with Baoshan Steel Complex and Joint Fund for Yalong River Hydropower Development Research with Ertan Hydropower Development Company, respectively, which cover many research areas, such as metallic materials, metallurgy, energy sources, mechanical engineering, electrical engineering, water conservancy, etc.

Division I of Materials Science

The Division mainly supports basic research on metals, alloys and metal-based materials. The objects of General Program projects should be definitely related to metallic materials. In their proposals, applicants should pay attention to the merits of focused scientific problems involved with metallic materials and it is necessary to present a sound reasoning of original ideas as well. With respect to the application of some scientific knowledge in metallic materials researches, applicants should put forward definite material-relevant scientific problems. The Division also supports those fundamental aspects in the preparation process of materials that significantly influence the microstructures, properties and in-service performance of materials.

The funding scope of the Division covers such broad areas as processing science, microstructural characterization and morphology, surface and interface, impurities and defects of metallic materials and alloys and their influence on the properties and performance of materials, alloy phase diagram, phase transformation and alloy design of metallic materials and their application in developing advanced metallic materials, material-relevant scientific problems and new ideas in environment friendly materials, the mechanism and control of interactions of metallic materials and environment, consequent failure and functional degradation, new-type metallic functional materials and structural materials, and the development of modern analysis and test methods, principles and techniques incorporating basic and applied basic researches of metallic materials.

The Division requires that applicants and chief members of the project teams should provide solid research results obtained in their previous NSFC projects granted in recent years, publication listings in SCI, EI and national core periodicals in the past five years, citation data and a description of invited talk presented at international conferences.

The listed data and description should be true as it is, otherwise the evaluation of the application will be unfavorably influenced.

The Division will continue to pay attention to those well-established research groups and/or institutions with good infrastructures in the field of materials science. Although the government gradually increases its investment in basic research and the funding from the Division goes higher, the fund should be mainly used for research expenses rather than for equipment procurement and laboratory renovation.

In 2005, the Division received 741 proposals for General Program project, including 593 for Free Application, 122 for Young Scientists Fund and 26 for Fund for Less Developed Regions. Plus other applications for programs such as the Steel and Iron Joint Fund, Major Research Plan, etc., the total number of proposals reached 819. Through peer review and panel evaluation, 138 General Program projects were funded, in which 110 were for Free Application, 24 for Young Scientists Fund and 4 for the Fund for Less Developed Regions.

The success rate is 18.6% and the funding intensity is 270,000 yuan on average. It is noticed that except for those areas such as nano-structured metals, amorphous alloys and functional materials which are still active in the past years, more applicants focus their attention on the research of magnesium based alloys. It reflects to some extent what researchers are interested in but the Division hopes that researchers should pay attention not only to the frontiers in the hot areas, but also to the fundamental issues with scientific merits and ideas with creativity, so that the competitiveness of the proposals can be raised and the quality of research be improved subsequently.

The Division continues to encourage applicants to put forward new ideas and new concepts concerning the Key Program areas supported in recent years (including the areas to be supported in 2006) in their proposals for General Program projects. The Division also encourages cross-disciplinary and multi-disciplinary researches related to materials science that can drive and promote the development and progress of the related areas.

Division II of Materials Science

Inorganic Non-Metallic Materials Science

In inorganic non-metallic materials science, the Division supports both fundamental and applied researches on inorganic nonmetallic materials, and high priority is given to projects with creative ideas in this field. Interdisciplinary investigations with other related subjects are highly encouraged.

Along with the development in materials and processing technologies, new types of materials, including high-Tc superconducting ceramics, intelligent materials, biomaterials, new materials for energy application, nano-materials and so on, have been developed, which has greatly stimulated the academic activities in inorganic non-metallic materials science. At present, in the field of inorganic non-metallic materials, functional materials are being developed towards high efficiency, high reliability, high sensibility, intelligence and functional integration, while engineering materials towards high toughness, high specific strength, high wear-resistance, high corrosion-resistance, high-temperature endurance, low cost and high reliability. Simultaneously, conventional materials are also being remolded and upgraded. Furthermore, inorganic nonmetallic materials are playing ever-increasingly significant roles in information technologies, life science, energy and environment science and technologies.

A survey over all proposals in the past three years in inorganic non-metallic materials illustrates that researches in this subject have covered a broad range of areas and extensively interacted with other disciplines, and have witnessed significant increase in the number of proposals. In 2005, there were 1,014 applications for the General Program, increasing by 20.7% in comparison with that in 2004, and 16.6% of these applications were funded, in which 38% were interdisciplinary ones, involving information technologies, physics,

chemistry, life science, energy and environment science and technologies. The proposals for research on functional materials were dominative, accounting for 57% of the total. These proposals unfolded much innovative ideas and formed a number of hot-spots of research, such as nano-materials, ferroelectric and piezoelectric materials, photoelectric materials, photo catalysis materials, functional composite materials, and carbon-based materials, in which photoelectric functional materials were recently in the first place in the Division (about 22% of the total applications). There were still many applications from new energy materials, displaying materials, biomedical materials, etc. However, more weight should be given to creative ideas. In engineering ceramic materials, proposals mainly came from a few research institutions (about 7.6% of the total proposals). Engineering ceramic materials are developing towards a higher stage in high toughness, workability and reliability. Nevertheless, there were still a number of low-quality proposals which simply followed and repeated previously existing researches, and were lack of either creative ideas or unique features, or research contents of inorganic nonmetallic materials.

According to the needs of the development and considerations mentioned above, the Division will continue to encourage researches in 2006 in the following areas: processing and applied research of novel inorganic nonmetallic functional materials in combination with the domestic resource distribution; novel processing technologies, physical and chemical issues, and the characterization of their properties for low-dimensional materials and nano-materials; research on materials featuring phase transformations induced by external fields and their application; interface, bonding and compatibility in composite materials along with their "mechanical-functional" integration and multifunctionality; processing science and techniques of materials with high performance, low cost and high reliability; studies on intelligent materials, new energy source materials, biomedical materials and eco-environmental materials; basic theoretical research on the design (at macro-, meso- and micro-levels, respectively) of inorganic nonmetallic materials and related processing science and technologies; and applied research on the improvement and remolding of the conventional inorganic nonmetallic materials by new theories, new technologies and new processing.

Organic polymer materials

In the field of organic polymer materials, the Division received 709 proposals in 2005, 126 more than that in 2004, which is an increase of 21.6%. Among the proposals, those for functional materials, composite materials, biomedical materials and eco-environmental polymer materials reached 119, 117, 94 and 51, respectively, showing that the four areas are the hotspots currently. In 2005, the success rate of proposals for organic polymer materials reached 17.2%. Among them the rate for Free Application was up to 17.5% and that for Young Scientists Fund was 16.6%.

At present the main tasks and trends for organic polymer materials science are as follows: 1) for general polymer materials, the focus is on the implementation of high performance and functional properties, the relationship between machine forming and congregation

state textures, and the variation of material textures and material properties in their utilization; 2) functional polymer materials and organic solid functional materials; 3) for polymer-based composites, the stress is on high performance, interface, new synthesis technology, computer aided technologies and low cost technology; 4) special polymer materials and engineering plastics.

Basic and applied basic researches in the following fields are encouraged: general polymer materials with high performance or functional properties, functional polymer materials and organic solid functional materials, preparation science and technical processes for polymer materials (e.g. new technique and new technology for material preparation and processing, new theories of reinforcement and toughening, fatigue and fracture, friction and lubrication, structures and performance of multi-component materials in congregation state, composite materials-based matrix resin and its interface properties, computer aided design and forming), adhesives, coatings and assistants of new organic polymers, biomedical polymer materials, organic nano-materials, intelligent materials and bionic polymer materials, eco-environmental polymer materials including natural polymer materials, environmental friendly polymer materials and renewable polymer materials.

The Division highly encourages fountainhead innovation, and promotes the interdisciplinary cooperation.

Division I of Engineering Science

The Division 1 of Engineering Sciences mainly supports fundamental researches in mining and metallurgy sciences, including such main fields as resource exploitation, safety science and engineering, mineral processing and separating, metallurgical and material physical-chemistry, ferrous and nonferrous metallurgy, material preparation and fabrication, eco-environment of mining and metallurgy, resource recycling, etc.

The development trends of the discipline at present are as follows: 1) Basic research scope in the above-mentioned fields has been increasingly extended and deepened. Many researches diverse and transfer from macro, middle scope to microscope, and each couples and intercrosses with another, from raw minerals to recycling of resource, from metal to composite materials, even functional materials. 2) Interdisciplinary differentiation and amalgamation had been strengthened. With the interdisciplinary amalgamation and differentiation with life science, informatics, mechanism, chemistry, materials science and managerial science, etc., new research fields such as resource recycling science, non-pollution process engineering, green catalyzing engineering, bio-metallurgy, environmental biochemical engineering, bio- and chemical mining, computing metallurgy and physical-chemical metallurgy, metallurgical informatics and electro-magnetic metallurgy have appeared. 3) Relationship between science and technology are getting increasingly closer. Equipment of mining and metallurgy, monitoring and controlling of system, metallurgical reaction engineering science and systems engineering, and metallurgical ecological

technology, etc., are integrated with each other, many new technologies, new methods and new branches of science have emerged. 4) Researches have been carried out much more quantitatively and accurately, e.g. precisely analyzing the composition of molten salts and slag, and precise control of rolling process. Many important research areas are expected to be studied deeply and systematically.

In 2005, 825 proposals were received by the Division, 20 % more than that of the previous year. Among which, 60 % dealt with the following researching fields: materials preparation and fabrication, resource exploitation, safety science and engineering, mineral engineering, resource extraction and matter separations, powder engineering and powder metallurgy. The fields received less than 10 proposals are metallurgical chemistry engineering and equipments, ocean and space metallurgy, other ways of resource utilization, underground space engineering and metallurgical reaction engineering. There were a few proposals dealing with special metallurgical methods and other new techniques, e.g., microwave, plasma, electromagnetism, laser and ultrasonic.

The Division will continuously promote interdisciplinary studies and the exploration of novel methods, encourage original ideas and innovations, emphasize applied basic research, especially those that would enhance our country's competitiveness in mining and metallurgy industry. The funds will favor those projects with theory importance, potential application, prior prospect and fundamental researches in new theory and new methods. Young scientists who have creative capability, good performance and good cooperation with others are encouraged. Researchers are encouraged to work systematically and consistently on a specific research field to form their own features. The ideas should be described explicitly in the proposals. Applicants should pay more attention to the fundamentality, creativity, feasibility and reality, and try to avoid stressing only on the practical needs and lack of scientific contents. Many failed in 2005 because of too short, empty contents and unsuitable form, others failed due to the reason of having no concrete program and too ambitious targets. Those applicants who have been funded before should offer the actual achievements and give clear indication of the papers published in recent years.

The main research areas encouraged by the Division are as follows: 1) theories and technologies on green mining, digital mine, prevention and mitigation of mine disaster, especially the theories about fire damp explosion, self-ignition of coal and mine flood; 2) preparation, change and working of mineral materials; 3) recycling of resource as in carbon dioxide fixation and utilization, new theories and new methodologies in metallurgical reaction engineering and its related eco-environment (such as new processes of economical atom reaction; 4) metallurgical and material physical chemistry; 5) theory of metallurgy and process under extreme and special conditions; 6) metallurgical reaction engineering science, metallurgical chemical engineering process and equipments; 7) theories on uniformity control of batch and/or ultra-size metallurgical products. More funding will be granted to projects of high cost (about 450 thousand yuan per project), such as pyro-metallurgy, electrochemical-metallurgy and plastic forming of metals.

Division II of Engineering Science

The Division mainly supports basic and applied basic research in the fields of mechanical and manufacturing engineering science. Basic theories, methods and technologies of mechanical structures and systems, which involve the products' whole life cycle of designing, manufacturing, running, maintaining, discarding and recovering, are studied in the mechanical and manufacturing engineering science. The funding range in the Division are as follows: mechanics and robotics, mechanical transmission, mechanical vibration, mechanical structural strength, tribology, mechanical design, micro-nano mechanics, bio-simulation mechanics, component forming manufacturing, component processing manufacturing, manufacture system and automation, the theory and technology in mechanical testing, micro-electromechanical systems, biotic manufacturing, green manufacturing, operating and managing in manufacture system.

Various proposals submitted to the Division in 2005 reached a total of 1,742. 1,672 of them were for General Program projects (including 1,340 for Free Application, 309 for Young Scientists Fund and 23 for Fund for Less Developed Regions), 17 for Key Program projects, 44 for the Fund for Distinguished Young Scholars and Joint Research Fund for Overseas, Hong Kong and Macao Young Scientists, 2 for Special Funds, 1 for Major Research Program, 5 for Joint Funds and 1 for Creative Research Groups, respectively. They represented an increase of 21% (300) in comparison with that in the previous year. More institutions (240) submitted proposals, and most of them were universities (only 24 research institutes). 40 institutions submitted more than 10 proposals each, reaching 66% of the total. The units funded were less than 100, which means 60% of institutions were less competitive. Although proposals for Young Scientists Fund reached 309 (29% more than that in the previous year), but excellent ones were not enough according to the review results. Concerning the research contents, proposals in the fields of structure strength and cast were not increased, while dynamics and forming still remained numerous. The continued increase of proposals in the fields of electronic manufacture and micro-electromechanical systems (MEMS) indicates that researches in these fields are very active, but quite a number of proposals are at low-level, following others' research and lack of innovation. More proposals were involved with interdisciplinary research, e.g. photo-electronic manufacture and mechanical system control intercrossing with information science, bio-simulation mechanic and biotic manufacturing with life science, material tribology and surface technology with materials science, which means the interdisciplinary researches keep on actively. Yet, some proposals did not contain relevant problems valuable to mechanical engineering and failed to be supported, such as forming manufacturing, tribology and surface engineering, biotic manufacturing and manufacture system management, etc. These proposals did not suit for the Division's funding scope. Some proposals were not filled in according to the requirements and some application procedures were not completed, such as failing to provide sufficient proofs for the application£¨lacking scientific description of innovative ideas, containing only ambiguous research objectives and technical approaches, not having detailed project budget, and exceeding the number of projects or applications allowed by NSFC. All this affected the project competition.

In 2005, the Division approved 303 projects of various categories with a total funding of 88,36 million yuan, including 290 General Program projects with a funding of 71.68 million yuan (235 for Free Application, 51 for Young Scientists Fund and 4 for Fund for Less Developed Regions), the success rate was 17.3% and the funding intensity was 258,000 yuan. 5 Key Program projects were supported with a funding of 9.7 million yuan and 8 for Fund for Distinguished Young Scholars, Creative Research Groups and Joint Research Fund for Overseas Chinese, Hong Kong and Macao Young Scientists with a total funding of 7.1 million yuan. The project evaluation procedure incarnates the principles of equal competition, science democracy, inspiriting innovation, linking previous performance with present applications, funding continuity, and encouraging international and domestic cooperation. The audacious non-consensus proposals are encouraged. 18 projects of Small Fund for Exploratory Studies were approved. Proposals which have such characteristics as obviously interdisciplinary, connecting with people's health, having international and domestic cooperation and cooperation with domestic enterprises on mechanical engineering applied basic research fields were granted preferentially. The above principles will also be applicable in the next year's project application.

In the early 21st century, the development tendency of mechanical and manufacturing science is the integration and overlapping of various disciplines. Micro-precision, digital intelligence, high-efficiency cleaning and flexible integration have taken the leading position in the mainstream. Along with the world advancement, the national demands as well as the development of the discipline, some typical characteristics and tendencies emerge in the discipline of mechanical and manufacturing engineering science. The development of high-technology fields like photo-electronics, micro-nanotechnology, aeronautics and astronautics, biological medicine, crucial engineering and technology claim mechanical and manufacturing engineering science provide these fields with new theories, new methods and new technologies. Therefore, some new fields like micro-nano manufacturing, biotic manufacturing and micro-electronics manufacturing are taking shape. On the other hand, along with the overlapping of mechanical and manufacturing engineering science, life science, materials science, management science as well as nanotechnology science, some new interdisciplinary fields, like bio-simulation mechanics, nanometer tribology, manufacturing informatics as well as manufacturing management science, come into existence. In the future, advanced facilities and apparatus technology with our own intellectual property rights will be greatly promoted, and therefore, much attention should be paid to basic research in the design and manufacture based on significant facilities of originalinnovation as well as high-tech instruments and equipment. In addition, our national resources and environment are facing with severe challenges in the 21st century, basic research in mechanics and manufacturing engineering science should attach more importance than ever to the environmental protection, products' safety, saving of materials and energy, remanufacturing of electromechanical facilities and new energy manufacturing fields.

Based on the disciplinary development tendency and tasks of the Division, priority support will be given to basic research on electromechanical facilities of self-innovation and the frontiers of disciplinary development. Resources and environment are the two main fields

that are closely related to the long-term national benefits and sustainable development. Hence, basic research of new principles, new methods and new technology and technique of electromechanical facilities which are connected with resource-saving should be given preferential support. The priorities will include (but not limited to) design theories and manufacturing basis based on resource-saving, near forming basis with energy-saving and high efficiency precision, dynamic modeling simulation of complex mechanical system, theories and methods of optimizing design and intelligence control, various damage failure mechanisms of significant mechanical structure and system, safety evaluation criteria, early-stage damage detection as well as the theories, technologies and methods of fault self-healing, mechanical bionic principles and design theories and manufacturing methods of bio-simulation mechanic, micro mechanics and basic research of micro-manufacturing, etc.

Division III of Engineering Science

The Division supports fundamental researches in the field of engineering thermophysics and energy utilization that involves in engineering thermodynamics, refrigeration and cryogenics and dynamic characteristics of thermodynamic systems, aerothermodynamics, heat and mass transfer, multi-phase flow, combustion, thermophysical properties and measurement, renewable energy utilization and other fundamental and innovative researches related to engineering thermophysics and energy utilization.

The Division gives priorities to those fundamental researches with important theoretical significance and academic value, mastering international scientific frontiers, far-sighted and exploratory, possible to become new growth areas and stimulative for disciplinary development, and those being important for national economic construction. Technological product development and low-level repetitious research will not be supported. Interdisciplinary proposals, proposals with international cooperation background and those applicants who have acquired outstanding achievements in their previous NSFC projects will be preferentially supported. By this way, the Division hopes to produce more achievements with original creativity and with our own intellectual property rights, and to promote the steady development of basic and applied basic research in the fields of engineering thermophysics and energy utilization.

Proposals in recent years demonstrate that research in the field of engineering thermophysics and energy utilization is very active. The research contents have gone deeper, research objectives have been more extensive and research achievements have been obtained for wider range of applications. In 2004, the Division funded 120 General Program projects (including 13 projects of Small Fund for Exploratory Studies) with a success rate of 19.3%. In 2005, the Division received 811 proposals, of which 735 proposals were for General Program projects, with an increase of 18.5% (115 proposals more) compared with that in 2004, and the proposals increased remarkably in the areas of combustion and combustion pollutant generation and control, multi-phase flow and phase transformation, renewable energy utilization, etc. The Division funded 140 General Program projects (including 10

for Small Fund for Exploratory Studies), with a success rate of 19.05%.

The main development trends of the discipline are as follows. 1) Research on the basic issues becomes deepened from macro-level to meso-level and micro-level, from isolated studies to coupled studies, from common parameters to parameters under ultra- or extreme conditions, from routine thermophysical problems to random, unsteady, multi-dimension, multi-phase and complicated thermophysical problems and intercrossing research in the discipline. Moreover, research becomes more quantitative and precise. 2) Research has crossed traditional disciplinary borders and formed interdisciplinary projects with related disciplines (e.g. with physics, chemistry, life science, information science, materials science, environment and safety). Creative researches in the following areas are encouraged: mechanism of new type thermodynamic cycles and non-equilibrium thermal dynamics, dynamics, optimization and control of complicated systems, turbulence properties of internal flows and properties and control of unsteady flows, porous media and micro-scale heat and mass transfer, radiation and heat exchange by phase transformation, clean, supersonic and micro-scale combustion, thermophysical problems in the prevention of disasters, mechanism of interaction between phases and thermophysical model in multi-phase flow, new principles and methods in thermophysical measurement, and new thermophysical principles in renewable energy transformation and utilization.

The Division requires that applicants provide detailed information on their research achievements obtained in all completed and on-going NSFC projects and list papers recently published on international and domestic publications. All of the provided information must be impersonal and true, or it will directly affect the approval of the applications.

Division IV of Engineering Science

The Division's funding scope mainly covers architecture, environmental engineering and civil engineering. The development trends of architecture are research on the development of region, city and building, the innovation of construction techniques from the viewpoint of human-environment relationship, and research on basic theory and methods of planning and design based on sustainable development strategy. The emphasis of environmental engineering research is on water and air quality ensuring systems, as well as theories and methods for comprehensive control, resource management and harmless disposal of various pollutants and wastes. Civil engineering stresses that the studies should be closely combined with engineering practice to solve basic theoretical issues and foresighted key technological problems arising in engineering construction. The interdisciplinary interaction, the application of advanced experiment and information technologies and the adoption of new materials, new structures and new technologies are the major features in the development of these research fields.

In architecture, focus should be on new science problems arising in urban construction, exploration and application of new technologies and new methods. Research on

environmental engineering includes water purification, wastewater treatment and utilization, municipal water supply and drainage system, urban refuse disposal and utilization, air pollution cleaning, and control and renovation of the polluted environment, with emphasis on key scientific issues related to new theories and technical bases of new high-efficiency and low-consumption technologies. Other research subjects related to environmental science should be submitted to other relevant divisions. In civil engineering, more attention should be paid to innovative research on the analysis, design and reliability of the complex structure. Key scientific problems on the following topics are encouraged: intelligent structural systems and performance design theories in civil engineering, disaster effect, failure mechanism and performance control of civil infrastructure and structures, new structure systems and constructing technology, modern structure experiment, on-spot measurement and digital simulation technology, and health diagnosis and renovation of structures. Research on structural disaster-resistance on the level of overall structural system should be strengthened, and efforts be made to improve the innovativeness and practicality in the study of seismic-resistant and wind-resistant engineering structures. In the area of geo-technical engineering, researchers should focus their attention on the engineering properties of soil under complex conditions, and invalidation mechanism and control methods of geotechnical engineering. In traffic engineering, the emphasis is on the research of planning theory, key technology and management methods in traffic infrastructure.

Division V of Engineering Science

Hydraulic science and engineering

The Division is mainly responsible for funding projects in water science and water management, hydraulic engineering and ocean engineering, and electrical engineering.

In hydro-science and engineering (water science and water management, and hydraulic and ocean engineering), 632 proposals were received in 2005 for General Program projects, in which 476 proposals were for Free Application, 136 for Young Scientists Fund and 20 for Fund for Less Developed Regions. Proposals were increased by 20% in number compared with that in 2004. Among the proposals, 314 fell in the area of water science and water management, and 318 in hydraulic engineering and ocean engineering. The numbers of proposals for soil and rock mechanics and engineering, hydraulic and marine structures, hydrology and water resources, irrigation and water-soil engineering were 101, 104, 94 and 83, respectively, representing a large proportion. However, proposals for hydraulic materials and hydraulic machinery were 24 and 24, respectively, representing a small proportion. Proposals in other fields such as environmental hydraulics and water environmental engineering, hydraulics and hydrodynamics and sediment transportation remained almost the same as that of 2004. Of all the proposals, 114 projects were funded in 2005, accounting for 18% of the total, including 10 projects of Small Fund for Exploratory Studies. The average funding of Free Application projects and Young Scientists Fund projects are 270,000 yuan and 240,000 yuan, respectively. 22 projects among additional 116

proposals are supported by the Joint Fund of Yalongjiang Development Research.

Hydro science and engineering research shows the following main trends: 1) Multidisciplinary methods are used to solve the practical and urgent water related issues in hydraulic engineering, ocean engineering, agricultural engineering and ecological and environmental engineering. 2) The frontiers in hydrology and water resource management are the impact of human activities, centralized management of river basins and large complex systems. Watershed environment protection and water pollution control of the rivers and offshore areas, especially the pollution mechanism of agricultural chemicals and urban drainage in bay area, are still the research focuses. Ecological water utilization, eco-hydraulics and eco-environmental water management become new growth points. 3) Because of the construction of major engineering projects, such as marine exploitation, transmitting electric power from the west to the east of China and diverting river water from the south to the north, extensive studies have been conducted on the structure engineering, geotechnical engineering of the hydraulic and ocean engineering, especially on the mechanical properties and damage mechanism of the complex structures, and ground work and their foundations. Moreover, research on new methodologies of disaster prevention and relief, and the environmental soil and rock mechanics have been greatly advanced. 4) Research on sediment movement and disaster, being at the international level, is at the prevalent status. However, exploratory research on silt resources and environment is still at the initial stage. Rapid development has been made in agricultural water-soil engineering, water-soil conservation and water saving technology, which is expected to remain as one of the most important research directions for a certain period. 5) Studies on hydraulic materials are still developing. The number of scientists studying industrial hydraulics and hydraulic machinery is increased but those for hydraulics and hydrodynamics keep relatively unchanged.

The followings are the encouraged research areas: disaster mechanism of rock-soils and hydraulic structures system, methods of disaster prevention and relief in hydraulic and ocean engineering, deformation and strength behaviors of rock and soils under complex situations, mechanism of strengthening rock and soils with anchors, key issues related to super-high dam projects, theory and methods to design deep harbors and ocean structures, irrigation technology of saving water, environment protection and efficiency improvement of water use, methods for recovering polluted watershed, interaction between sediment and pollution, eco-environmental water management, impact of major dam projects on the eco-environment, the sustainable utilization and management of water resources, and hydro-informatics.

Electrical science and engineering

Regarding to electrical engineering, among the 489 proposals submitted to the Division for General Program projects in 2005, 96 were approved. Detailed statistics is listed below: 75 out of 380 proposals submitted were for Free Application, 20 out of 98 for Young Scientists Fund, and 1 out of 11 for Fund for Less Developed Regions were funded,

respectively. Compared with the number of proposals in 2004, they represent an increase of 20%, 29% and 57%, respectively. Compared with the number of funded projects, they represent an increase of 30%, 18% and -67%, respectively. The success rates in 2005 were 109%, 91% and 21% of those in 2004, respectively.

As for the projects approved for General Program, those in electric machines and apparatus account for 21%, power systems for 22%, high voltage and insulation technologies and electromagnetic materials for 17%, power electronics for 10%, and pulsed power and discharge plasma technologies for 4%.

In the Tenth Five-Year Plan period from 2001 to 2005, the Division approved, in the field of electrical engineering, 375 General Program projects and 20 Key Program projects. Among the funded Key Program projects, five are interdisciplinary ones, two belong to the Joint Funds allocated for energy saving and environment protection and one belongs to the Major Research Plan.

The focus of electrical engineering research is on the following aspects: applied basic issues of new materials in electrical power and engineering technologies, interdisciplinary research with life science, especially with biological medicine and clinical medicine, information technologies in electrical engineering, and principles on the microscopic level and non-linear problems. The hot spots for research includes: 1) extra/ultra-high voltage transmission technologies adopted in the West-East power transmission project, 2) theories and methods of wide-area security defense system for nation-wide interconnected, large scale power systems, and grid computation, 3) crucial technologies of pulsed power switches and energy storage, 4) properties of dielectrics and high-voltage insulation technologies under unconventional conditions, 5) space charge issues in high polymer dielectrics, 6) bases of high-temperature superconducting technologies, 7) control and integration of power conversion system, 8) rules, theories and application of discharge in various forms and conditions, such as atmospheric pressure discharge plasma, metal steam electric arc discharge plasma, 9) electromagnetic compatibility issues of electrical equipment and micro-electronic systems, 10) electromagnetism in biology and medical science concerning human health, such as the rule of electrical signal conduction of acupuncture, and advanced computation methods for electromagnetic imaging, and 11) issues related to electricity energy saving, renewable energy power generation technologies and the composite system for sustainable development, etc.

The Division will continue to encourage innovative ideas and research on new theories, materials, structures, systems and relevant technologies concentrating on the electricity energy generation, conversion, transmission and utilization. Meanwhile, the exploration in science and technologies required from key national demands, and cross-disciplinary research are encouraged. Specifically, they are 1) technologies and systems of renewable electricity energy generation, electricity energy saving and high density electricity energy storage; 2) distributed power systems and independent power systems; 3) extra/ultra-high voltage transmission and network safety; 4) key technical issues in manufacturing extra/

ultra-high voltage transmission apparatus; 5) new materials for electrical engineering and the application of emerging functional materials; 6) bases of pulsed power technology and discharge plasma technology; 7) measurement of high power steep pulse and other specific signals; 8) application of high temperature Superconductivity to electric engineering; 9) high efficient analysis for direct and inverse problems of complicated and coupling fields; 10) electromagnetic compatibility and test methodology; 11) basis of resource saving and environment friendly electrotechnologies; 12) sensing and processing technology for electromagnetic and biologic signal, and 13) interdisciplinary research with medicine, biology, materials and environment sciences.

The Division encourages macro researches focusing on more complicated systems, micro researches on more fundamental phenomena, and research on non-linear process problems. Meanwhile, the Division prefers the innovation of methodology and approaches, and attaches great importance to the experimental verification and scientific procedures of experiments and quantification.

Department of Information Sciences

The Department of Information Sciences supports researches on the generation, acquisition, storage, transmission and processing of information. Based on the trends of disciplinary development and social progress in recent years, the following research fields are selected for preferential support: theory and application of electronics, radio wave transmission and new types of antenna, advanced information processing, future communication theory and system, space information system, key problems in theoretical computer sciences, computer software, computer system configuration and storage system, key technologies in computer applications, computer network and distributed computer system, bionic sensing and advanced sensors, modeling, analysis and control of complex systems, basic theory and application of intelligent science, advanced robot technology and application, basic research on semiconductor integrated chip system, quantum information technology, key scientific issues in optical information processing, advanced laser technology, and biomedical optics. Particular stress is laid on researches that can meet the social demands and have far-reaching importance in promoting the national, social and scientific development. The encouraged research fields listed in the *Guide to Programs* in each division of the Department are only for reference and guidance to application in 2006, and are subject to change every year in the future.

Scientific and technical issues in information science are increasingly interdisciplinary in nature. Therefore, the Department will give preferential support to those proposals of cross disciplinary researches between information science and mathematics, physics, materials, life science, chemistry and so on. The Department also encourages applicants to submit interdisciplinary research proposals and proposals for cooperation among scientists with different backgrounds and knowledge. The Department encourages Chinese scientists to conduct international cooperative research, and will continue to implement preferential support policy under similar conditions, i.e., to give more support to those proposals with international cooperative background if the peer review rating is the same, so as to stimulate and promote Chinese scientists to address scientific issues in frontier areas of information science together with scientists abroad.

NSFC and the Civil Aviation Administration of China signed an agreement on jointly supporting General Program projects. This joint fund is open to all scientists in China, with the aim to attract scientists in universities and research institutes to participate in basic research that have background in civil aviation technologies. For details on submitting applications and areas of funding, please refer to the relevant pages in the Joint Fund section in the Guide. The Department has signed the agreement with Microsoft Research Institute Asia to jointly fund research projects, which cover both Key Program and General Program projects, including network techniques, man-machine interface techniques, image and graphics techniques, etc. Please contact the Division I and Division II for detailed information. Scientists could also submit proposals to relevant divisions for studying key scientific issues within the jointly funded research areas for Key Program. If there are

changes in contents, then relevant information will be published on the website of NSFC. Those who are interested, please visit our website for the updated information.

Funding for General Program Projects in Recent Years

Scientific Division		FY 2004			FY 2005		
		Projects granted	Funds (10, 000 yuan)	Rate (%)	Projects granted	Funds (10, 000 yuan)	Rate (%)
Division I	Communication and electronic system	218+30*	5,163	18.77	290+38*	6,487	21.24
	Signal and new						
	type of information processing						
Division II	Computer science	172+25*	4,078	18.87	232+38*	5,545	19.05
	Network and information security						
Division III	Control theory and control engineering	138+20*	3,293	19.04	190+26*	4,570	21.45
	System science and system engineering						
	Intelligent system						
Division IV	Semiconductor and information devices	157+24*	3,777	19.85	211+25	5,204	20.65
	Information optics and photo-electronic devices						
	Laser technique and technical optics						
Total		685+99*	16,311	19.09	923+127*	21,806	20.50
Averaged funding* (10,000 yuan/project)		20.80 (22.95**)			21.11 (23.19**)		

Notes: * Projects of Small Fund Exploratory Studies.

** Average funding does not include Small Fund projects.

In the 2005 project evaluation, the Department increased its funding to projects of Funds for Less Developed Regions, and continued to pay attention to Young Scientists Fund projects. The Department has given proper priorities to those PIs who won the rating of "excellent" for making substantial progress in finishing their projects of Small-Fund for Exploratory Studies. The Department evaluates and classifies the completed projects. For those who are rated "excellent" or "poor", the Department gives full consideration to their performance when reviewing their new applications for funding. The experts in the

evaluation panel make strict checks on the projects that were not properly completed, and suggest giving de-priority to the related institutions that implemented and managed poorly or failed to submit reports in time. In recent years, there remain some problems in the evaluation at project completion, e.g., acknowledgement to NSFC's support in articles published in academic journals did not follow the standard format or even did not appear at all. These problems must be brought to the attention of applicants and management sectors of related institutions undertaking research projects funded by NSFC.

In 2006, the Department of Information Sciences and the Department of Mathematical and Physical Sciences will continue to support interdisciplinary research projects that require combined efforts from information science and mathematics. The success rate and funding amount will not be lower than the average of either department. Program areas to be supported include mathematical methods in modern computer science, mathematical methods in information security, information system and advanced control theory. Interdisciplinary projects in the following areas (but not limited to) will be encouraged:

1. Theory and algorithm of integer representation of real numbers
   To design and realize algorithms by computer, and to give complexity analysis of the algorithm.
2. Theory and methods of formalized representation of software systems
   Using formalization theory and methods, to describe and represent practical software system, not only applicable to real time application software systems, but also applicable to interactive, discrete event software systems.
3. Theory and method of designing security software systems
   In combination with typical software systems (system software or application software), to analyze, design and develop the theory, algorithm and system structure for software system safety performance improvement, and verify both theoretically and with practical examples the advantages of proposed theory, algorithm and system structures
4. Theoretical studies on new software system structure
   Addressing the need of current software application, to study the structure, theory and methods of novel software system structure, and in combination with practical software system, to give appropriate scientific characteristics.
5. Theoretical studies on the validation of software systems
   It is to establish the theory and methods on the validation of software system development, so as to ensure the validity of the developed software.
6. Theory and methods of formalized representation of practical engineering projects.

Division I of Information Science

The Division mainly supports basic research in electronic science and technology, information theory and information system as well as related interdisciplinary research.

The Division hopes to strengthen the combination of theory with actual application while, in particular, paying attention to the innovation of theoretical methods in electronic science

and technology. Research areas encouraged are circuit and system, radio wave transmission theory, electromagnetic field transient performance, electromagnetic scattering and inverse scattering, high precision and high efficiency electromagnetic field computation method, electromagnetic compatibility and protection, microwave millimeter wave device and integrated circuit, new style vacuum device, plasma electron device, superpower microwave technique and application, new style antenna technology, new types of electronic materials and devices, new types of sensors, nanometer-electronics, module-electronics, biomedical electronics, biological information detection and recognition technology, and extraction and processing of information in the diagnosis of traditional Chinese medicine. The Division encourages applicants to carry out innovative frontier researches such as nanometer electron device, electromagnetic property and application of new type media, tera hertz technology, physical field biological effect mechanism and so on.

Centering around the main fields of acquisition, transmission, process, storage, display and application of information in the areas of information theory and information system, the Division will keep on its support to encoding technique, sensing technique system, optical communication system, network security and system reliability, communication software and protocol, remote sensing telemetry, weak signal detecting and processing, self-adaptive signal processing, multidimensional signal processing, image processing and imaging technology, and other research directions. Applicants are encouraged to stress on probing new methods of signal analysis and processing, new theory and methods of image analysis and interpretation, and theory and methods in advanced information processing (such as biological information disposal). In order to adapt to the trend of digitalization, networking and intelligent information system, research and explorations in the following frontier areas will be strengthened: next generation mobile communication, mobile wireless Internet, new type network access technology, multimedia communication, space information processing, next generation network and new types of information system, etc.

In 2005, the Division received 1,554 proposals for General Program and 382 (including 38 for Small Fund for Exploratory Studies) were funded, including 23 projects for the Joint Funds of Civil Aviation Research. Among the funded in 2005, 74 projects were for Young Scientists Fund, 3 for Funds for Less Developed Regions, and 251 for Free Application. The success rate of Young Scientists Fund is 21.14% and that of Free Application is 21.11%. Some of the funded projects were related to interdisciplinary research such as information and mathematics, and health related subjects.

Major Research Plan associated with the Division involves “Network and information security”, “Basic research on semiconductor integrated chip system”, “Environment for scientific activities based on network” and “Basic research on nano technology”. Qualified experts are welcome to apply for relevant projects under the Guide to Major Research Plan in accordance with the published Guide.

In 2006, the Division will continue to implement the policy of giving preferential support to Young Scientists Fund and Fund for Less Developed Regions, encourage researches

related to S&T Olympic Games, network and information security, detection and imaging technologies, bio-information processing and space information processing, support innovative and cross-disciplinary research, continue to offer Small Fund for Exploratory Studies to start duly projects with risks, continue to stress on the linkage between research performance and new funding when evaluating new applications, and give greater funding to projects which scored outstanding achievements.

Division II of Information Science

The Division is responsible for funding researches on basic theories and key technologies related to computer science and technology and relevant interdisciplinary areas.

As one of the most active, fast growing and widely influencing area in information science, the objectives of computer science and technology are to obtain high speed, large storage, networking, highly reliable intelligence and individualization. It is suggested that applicants conceive their research projects around these main features.

In 2005, the Division received 1,417 proposals for General Program projects (excluding those in Major Research Plans), among which 992 were for Free Application, 387 for Young Scientists Fund and 38 for Fund for Less Developed Regions, with an increase of 36% from 2004. The Division approved 270 projects and the total success rate was 19%, with an average funding of 230,300 yuan per project (excluding projects of Small Fund for Exploratory Studies). Among the 232 approved for General Program projects, 162 were Free Application (including 6 interdisciplinary projects with the Department of Mathematical and Physical Sciences), 64 for Young Scientists Fund (including 6 interdisciplinary projects with the Department of Mathematical and Physical Sciences), and 6 for Fund for Less Developed Regions. In addition, the Division approved 38 1-year projects of Small Fund for Exploratory Studies.

It is worth noting that most proposals in 2005 are generally the follow-up type rather than original studies. We suggest that applicants should target the international frontiers and pick up basic and key scientific issues from practical problems to carry out research.

In 2006, the Division will focus on supporting core scientific issues and key technologies in computer science and original, basic, foresighted and cross-disciplinary studies, encourage researches on the theory of computer science, architecture and system software, software engineering and methods, natural language interpretation, intelligent mass information processing, multimedia, man-machine environment, mobile computation, data mining and machine learning, bio information computation, etc. Support will be focused on new computing theories and algorithms, distributed system and distributed processing, hardware-software integrated system and interdisciplinary researches.

In 2006, the Division will continue to support computer scientists in close cooperation

with specialists in life science, mathematics, physics, chemistry, geoscience, mechanical engineering and management science to jointly explore new ideas, new theories and novel approaches in these interdisciplinary areas so as to promote the mutual development of computer and other sciences. The Division also encourages and supports scientists to address those basic issues, which are well known internationally for their difficulty and significance, so as to upgrade the academic level of China's S&T team.

In 2006, the Division will continue to pay special attention to applications for Young Scientists Fund. Those who are under 35 years old by January 1, 2006 and haven't got any Young Scientists Fund grant are advised to apply for projects of the Fund.

Division III of Information Science

The Division supports research on basic theories and key technologies in automation science and technology and related interdisciplinary areas. Seven main areas to be supported include control theory and methodologies, navigation, guidance and advanced transducers, system science and system engineering, pattern recognition and application, artificial intelligence and knowledge science, robotics, and recognition science and intelligent information processing. Among them, micro and nano operation and quantum system control, bio informatics, recognition process and intelligent information processing, complex system modeling, analysis and control, etc., not only provide new challenges to automation science and technology, but also are becoming new research areas of automation science and technology. High consumption, high exhaust, high pollution and low efficiency problems in domestic industries and the demand of green economy and recycled economy by social development are all asking scientists in automation science and technology to find out scientific problems and research innovatively and make breakthroughs in key technologies. In a certain period of time in the future, the Division will continue to support innovative basic research and key technologies in the traditional areas, and also encourage research on basic research topics selected from the social economical development and national security, and encourage interdisciplinary research in these areas.

In 2005, the Division (formerly the Division of Automation Science) received 1,007 proposals for General Program projects (763 were for Free Application, 233 for Young Scientists Fund and 11 for the Fund for Less Developed Regions). The Division funded 190 projects (including 7 interdisciplinary projects with mathematics and 4 health related projects). The average funding is 232,300 yuan per project. In addition, the Division funded 26 projects of Small Fund for Exploratory Studies (including 1 interdisciplinary project with mathematics), with an average funding of 60,400 yuan per project. The success rate for General Program projects (including Small Fund for Exploratory Studies) is 21.45%. Compared with that in 2004, the success rate and funding per project were all increased. In 2005, 35 proposals (accounting for 3.5% of the total) were screened out in the preliminary review due to the violation of various application rules, slightly lower than that of 2004 (4.8%). Applicants are requested to read carefully the *Guide to Programs*, check the number of NSFC projects taken up or applied for by each member of the research team in the same

year so as to avoid such things happening again in 2006.

In 2006, major research areas encouraged include unified control and management of energy saving, low consumption and pollution reducing production process, network system and network system control, complex system modeling, analysis and safety control, control issues in system biology, new transducer types and multi source information merging, new theory and methods of pattern recognition, new theory and methods of artificial intelligence, advanced robotic system and key technologies, and cognitive process and intelligent information processing.

Division IV of Information Science

The Division mainly covers research work in two fields: semiconductor science and optics and photo-electronics. In recent years, along with the development of physics, chemistry, materials science and information science, these two disciplines have witnessed tremendous growth, in-depth intercrossing with other disciplines and formation of many newly emerged interdisciplinary areas. Semiconductor low-dimensional structure physics and materials, wide gap semiconductors, new information functional devices, micro-electronics and technology, quantum information technology, self-spin electronics, micro and nano photonics, atto second optics, bio-medical photonics, optical communication, optical storage and display, new optical/laser materials and devices, modern infrared physics and technology have become hotspots of international research frontiers. They provide an important foundation for the development of information science, become important components of modern science and technology and have promising prospects of application in the fields of space, energy sources, materials, biology, medical science, environment, advanced manufacturing technology, measurement and national security. The advances of research in these areas and interdisciplinary research will provide strong driving forces for the development of information science.

In 2005, the Division received totally 1,143 proposals for General Program projects (including 854 proposals for Free Application, 275 for Young Scientists Fund and 14 for Fund for Less Developed Regions). This was a 25% increase compared to 916 proposals in 2004, and the increase of proposals for Free Application, Young Scientists Fund and Fund for Less Developed Regions were 19%, 52% and -12% compared with that in 2004, respectively

In semiconductors branch, 90 proposals were submitted for semiconductor materials (74 in 2004), 131 for microelectronics (87 in 2004), 99 for semiconductor photo-electronics (74 in 2004), 61 for semiconductor and devices (33 in 2004), and 60 for semiconductor physics (35 in 2004). Though all sub-disciplines had large increase, microelectronics reached the top, semiconductor materials and semiconductor photo-electronics occupied the second place, while other semiconductor devices and semiconductor physics had only few applications. This phenomenon has sustained for many years. Fewer applications in

semiconductor physics will affect the sustainable development of semiconductor science, and fewer applications in other semiconductor devices will do the same to the range of application of semiconductor science. However, the Division will take proper regulatory measures to give preferential support to these two sub-disciplines.

In the main sub-branch fields of optics I, there were 84 applications for optical information processing (59 in 2004), 101 for photon electronic devices (126 in 2004), 99 for optical information communication (87 in 2004) and 25 for infrared techniques (16 in 2004). It can be seen that infrared techniques were relatively week, and optical information communication achieved higher increase, and photon electronic devices decreased a little.

In the main sub-branch fields of optics II, there were 116 applications for various laser devices (109 in 2004), 38 for nonlinear optics (24 in 2004), 27 for spectrum technology (16 in 2004), 48 for optical technology (60 in 2004), 87 for optical and photo-electronic materials (58 in 2004) and 66 for interdisciplinary problems in optics (25 in 2004). Applications in optical technology decreased, while those in interdisciplinary problems of optics and optical and photo-electronic materials had a satisfactory increase. Judging from the contents of proposals, integrated circuit design, high speed optical communication network and related various devices, solid laser devices, optical and photo-electronic materials and quantum optics were still the hot spots of research, and that photon crystals, various laser devices, various optical membrane, biomedical photonics and photoelectric functional materials had a high rate of increase, which was consistent with the strategic planning for the priority areas during the 10th Five-Year Plan period and the present *Guide to Programs* of NSFC.

In recent years, the development of semiconductor science and optics and photo-electronic technology has greatly pushed forward the progress of information science, materials science and bio-medical science in China and promoted the fast development of relevant industries. However, compared with the current status of the disciplinary development and social demands, basic research in this area needs to be strengthened.

In certain ways, micro-electronic experiments in labs have stretched to nanometer scale. Research related to nano-electronics, photo-electronics, self-spin electronics, molecular electronics and quantum electronics has witnessed vigorous development, related exploratory research on new phenomena, new materials and new devices has begun to score achievements and the integration of photons and photoelectrons has also been developed. The momentum of interdisciplinary penetration, intercrossing and merging will surely provide impetus to the sustainable development of information science.

According to the principles of encouraging original research and creating a favorable environment for S&T researchers, the Division will continue to ensure fairness and justice in the proposal review process so as to protect real creative projects. The Division emphasizes the close combination of basic research and application, encourages studies on the newly rising sub-disciplines and interdisciplinary and departmental crossing, encourages qualified

young scientists to apply for Young Scientists Fund, and keeps offering preferential support to excellent innovative projects with significant application prospects to push them to make contributions for the national security and economy.

It is hoped that scientists in related areas will strive to explore and put forward more, better and innovative proposals. In light of the research development trends and overall development of disciplines and experts' opinions solicited, the Division will encourage researches in the following fields this year: physical and technical issues in nanometer scale MOS devices, radio frequency and digital analogy mixed integrated circuit design, micro-nano optical and electro-mechanical device and technology, low dimensional quantum structure materials, physics and devices, wide gap semiconductor materials and devices, self-spin electronics, physics and devices, organic (polymer) and organic/inorganic composite materials, devices and mechanisms, theory and experiment of quantum information, quantum computing, high speed optical communication, optical exchange and transmission network element technology and devices, new technologies and devices of high density optical storage, transmission, display, detection and sensing, high speed real time optical information and image acquisition and processing, new laser device and functional materials, laser physics and new type laser technologies, micro-nano photonics, advanced optical manufacture technology, super spectrum imaging method and technology, study of new phenomena and new technology in atto second optics, information devices, and optics and photonic problems in health and biomedical sciences.

Department of Management Sciences

Management is referred to various kinds of activities and processes in which managers try to utilize various resources available, namely human power, materials, equipment, information and money to realize the predetermined objectives under the constantly changing environment. There are two divisions in the Department of Management Sciences: management science and engineering and business administration, and macro-management and policy.

In the next Five-Year Plan, the Department of Management Sciences will guide the research process, stress on the management practices in China and promote the independent innovation in management sciences.

In order to improve the research standard and support innovative proposals from Chinese scientists, the Department encourages researches integrating theory and application and dealing with interdisciplinary issues. The Department strongly encourages and supports high-quality researches with creativity through giving priority and increasing funding to those innovative research projects. It gives preferential support to proposals that combine theory innovation with practical application. Applicants must be familiar with international frontiers in the related areas, apply correct methodologies in their research, and promote the internationalization of their research results. The Department also hopes that researchers can abstract research issues from the reality and apply the research results for their solution.

During the past 20 years, noticeable progress has been made by Chinese scientists in applying and further developing knowledge and skills to solve management problems encountered in reality. But there still exist deficiencies in developing management sciences. For example, the research basis and teams need to be further strengthened, most of the research work only follows the international mainstream and few results have international influence, the research methodologies should be streamlined and basic data collection and database construction should be emphasized. There is a disconnection between theoretical research and application practice in management science, and management policy makers and researchers also need to understand and exchange between each other.

In general, proposals submitted to the Department should cross natural science and social science. However, proposals in pure social science will not be considered, because another organization in China, namely the National Social Science Foundation, may support them. Submission of a proposal to these two organizations simultaneously is not allowed.

The Department periodically evaluates all completed research projects. Scientists whose completed projects are evaluated highly will be given priority for funding when they apply for new ones. The Department publishes the evaluation results on its homepage.

In 2006, the Department will accept and process applications in three directions separately.

The number of projects to be granted in 2006 and the average amount per project will be roughly the same as that in 2005 (see Table below).

Please note that the Department also accepts applications for projects on energy management strategy in the Major Research Plan "Several Key Issues in Energy Use and Environmental Protection in the Western Regions of China" and traffic science management in GM-China Scientific Research Fund. Detailed introduction of these projects can be found in this guide.

Funding for General Program Projects in Recent Years

Unit: 10,000 yuan

Scientific Division		FY 2004			FY 2005		
		Projects granted	Funds	Rate (%)	Projects granted	Funds	Rate (%)
Division I	Management science and engineering	93+3*	1,330	15.82	122+4*	2,074	15.14
	Business administration	103+1*	1,427	14.33	139	2,286	13.37
Division II	Macro-management and policy	933+3*	1,873	12.76	161+1*	2,688	11.93
Total		329+7*	4,630	14.01	422+5*	7,048	13.22
Average amount per project		13.78(13.95**)			16.51(16.61**)		

Notes: * Projects of Small-Fund for Exploratory Studies to be completed in one year.

** Not including the projects of Small-Fund for Exploratory Studies.

The figures for projects of 2004 supported by "Special Grants for Research on Complexity Sciences" and GM-China Scientific Research Fund are not included in the Table. The data of 2005 include complexity and health science, but not the joint fund projects.

Division I of Management Science

The Division covers two areas, namely management science and engineering, and business administration.

In the management science and engineering, the Division mainly supports research projects associated with fundamental theories, methods and techniques in the field of management science. They include the history of management science, general management theory, operations management, decision-making and game theory, organization theory, management psychology and behavior, management system engineering, industrial engineering, information technology management, technology and theory of internet management, forecast, prediction and evaluation methods, quantitative economic analysis,

financial engineering, complexity science, knowledge management and others.

The Division will strengthen its support to research on basic theory and frontier areas, especially from Chinese management experience, culture and philosophy.

Since 2002, the number of proposals is increased rapidly at an annual rate of 26.35%. In 2005, the Division received 835 proposals in management science and engineering (634 for Free Application including 89 for complexity sciences, 191 for Young Scientists Fund including 9 for complexity sciences, and 10 for Fund for Less Developed Regions). Finally, 126 projects were funded, in which 89 were for Free Application (including 3 projects of Small-Fund for Exploratory Studies), 36 for Young Scientists Fund (including 1 project of Small-Fund for Exploratory Studies) and 1 for Fund for Less Developed Regions. The success rate is 15.14%.

In 2005, the following areas enjoyed more applications: operation research, MIS&DSS and management system engineering. Financial engineering, knowledge management, industry engineering, organization behavior and theory, decision making theory and technique, etc., are the focal topics in recent years. The areas such as game theory and technology, internet management, etc., received fewer proposals in comparison with that in the previous year.

The analysis on the applications in recent years reveals that the Division shares the same trend with the Department as a whole in terms of proposal quality. Many proposals still follow and apply the theory and methods of their peers in the West. Few of them reflect original ideas and innovation potentials on the basic theory, methodology and technology.

The Division stresses on basic research and originality. It also encourages finding new problems, exploring new theories and inventing new techniques and new methods. Research should conform to the standards widely accepted in international academic circles, address the utilization of integrated scientific methodology and aim at the research frontiers so as to achieve innovation in various aspects. Proposals with good background in conducting international collaboration are encouraged.

From 2006, the Special Grants for Research on Complexity Sciences is abolished in the Division and related proposals of management complexity may be submitted to the Division as code G0116.

In business administration, support is mainly given to basic research and some applied basic researches in business administration and nonprofit organization management. These researches are generally conducted at micro-level, referring to the theories, methods and techniques. The main funding areas include strategy management, enterprise culture, corporate governance, human resources management, enterprise finance management (including accounting theories and methods, and auditing management), marketing, operation management, quality engineering, logistic and supply chain management, service

management, technology management and technology innovation, technology economics, project management, information management and e-business, non-profit organization management, and so on.

In 2005, 1,041 proposals were received in business administration. There were 818 proposals for Free Application (an increase of 37.7% than that of the previous year), 205 for Young Scientists Fund (an increase of 65.3%) and 18 for Less Developed Regions (an increase of 125%). Finally, 139 projects were funded, in which 108 were for Free Application, 29 for Young Scientists Fund and 2 for Less Developed Regions.

In 2005, compared to other areas, the following fields witnessed more applications and funded projects: enterprise financial management, marketing, strategy management, and logistic and supply chain management, etc., showing strong research ability. The quality and quantity of proposals in R&D management and technology innovation are better than that of the previous year. In product management, quality management, service management and e-commerce areas, proposals increased compared with that of the previous year and shown original ideas and innovation potentials, but were still weak in theory. It is relatively weak in non-profit organization management and research results can't match the needs of the social economic development, although the applications are increased in number.

In 2006, the Division still aims to the original innovation and frontier topics of basic science. Attention will be paid to proposals which are original and innovative in effectively combining case and positive studies as well as scenario observation and analysis. Projects to be funded are expected to explore new management laws and develop new theories and methods with Chinese features. Proposals with fundamental data collection will be encouraged.

In order to improve the research quality, the Division will continue to support the frontier issues in such areas as business theory, business strategy, enterprise finance management, operations management and human resources management. Priority will be given to researches on marketing, service management, quality management and engineering, information resource management and e-commerce, risk and safety management in large-project, non-profit organization management, and so on.

Division II of Management Science

The Division supports research in the field of macro-management and policy, and the Emergency Research Program associated with timely studies on some difficult and urgent management related problems in current social and economy development in China.

The following research areas are covered by the Division: macro-economy management and policy, financial management and policy, public administration and policies, agriculture economics management, science and technology management and policies, library-

information-archive management, natural resources and environment management, etc. The Division addresses applied basic researches originated from the real macro-problems existing in China, aiming at providing assistance to the country's macro-decision-making and training research talents, and promoting innovative research for the disciplinary development.

In 2005, the Division received 1,359 proposals (1,069 for Free Application, 231 for Young Scientists Fund and 59 for Less Developed Regions). Finally, 162 projects (including 1 for one-year Small-Fund of Exploratory Studies and 5 for health science) were funded, in which 126 were for Free Application, 29 for Young Scientists Fund and 7 for Less Developed Regions. The approval rate is 11.93%.

In 2005, more applications were submitted and granted in such areas as public administration, finance management, agriculture economics management and resource and environment management. The success rate in agriculture economics management, S&T policy and management and information and library management was relatively higher. Proposals increased fast in such focal topics as earth management, industry cluster, e-government management and social insurance, which show that applicants take great care of China's reform progress and apply the management theories and methods to analyze the emerging issues during the reform.

In 2006, the Division will pay more attention to researches in such topics as the theories and methods of public administration and public production, Sci-Tech policy and management, health care management, urban and regional development management, e-government and its management, education management and ecosystem management.

Applications in recent years show the following problems in research work. Firstly, applicants can't utilize the methodology in dealing with the process and have no clear ideas on how to treat the problems. Secondly, they do not really connect the theory with practice in China's management issues. And thirdly, some researchers find hard to address clear definitions of important issues, important management issues and important academic management problems.

Many of the sub-disciplines covered by the Division show an unbalanced development. The Division encourages research projects with sound and stable background. The problems to be studied should be originated in China, research methods used should be feasible and acceptable by the academic circles, and research results should be recognized by international communities. Applicants are supposed to distinguish the difference between management research and management practice. Applicants are requested to refine their topics for study and explore the central parts of the problems, try to describe accurately the problems to be studied, state clearly the research methods to be adopted, and show how to overcome key difficulties encountered in the studies. The Division does not support proposals that are solely based on general work in industrial sectors.

II. Key Program

NSFC's Key Program projects mainly support in-depth, systematic and innovative researches that are integrated with the national demand and the frontier areas of international research, in key areas which have good research basis and accumulations or there are new growth points of research disciplines. As a principle, Key Program projects should have limited objectives, limited research scope and clear goals, pay attention to the intercrossing of disciplines and make full use of the existing major scientific research bases. In general, one project can only be undertaken by one institution. Collaborators are allowed only if absolutely necessary, with the limitation of no more than two. Research length is usually 4 years (unless specified otherwise). In the *Guide to Program*, Key Program projects are introduced by each department, including research areas, application requirements and special notifications. Applicants are also asked to read the foreword and the beginning section of General Program description in each department for the overall introduction and funding policies.

Department of Mathematical and Physical Sciences

Key Program projects are introduced in sections of each scientific division, including notification and requirements. When applying for Key Program projects listed as key reviewed projects at the panel review meetings, applicants should give oral presentation at panel review meetings.

In the Eleventh Five-Year Plan period, in order to encourage competition, promote the generation of projects with innovative ideas, the Department will announce more project areas than projects and research directions to be funded, and let the research directions guide applicants to choose research topics. Key Program projects are determined mainly based on the funding priority areas proposed in the study report of disciplinary strategic development in the Eleventh Five-Year Plan period, so as to plan the overall development of disciplines.

In 2006, the divisions of mathematics and physics II will announce topics and research contents, and the divisions of mechanics, astronomy and physics I will specify research areas and let applicants to choose their own research topics and contents.

In 2006, the Department plans to fund about 38 Key Program projects with a total funding of 68 million. Details are given in sections of each division. Please note that according to the management regulations of Key Program projects, the number of research units applying

for the same Key Program project cannot exceed 3.

Division of Mathematics

In 2006, 8 Key Program projects are to be funded with an average funding of 1.3 million yuan per project.

1. Representation theory of group and algebra

Research contents:
1) Representation theory of finite modules, algebraic group representation theory and associative algebra representation theory, and modern derivative domain theory;
2) Using Hall algebra as a bridge to investigate the deep relationship of Quiver representation and trigonometry category with quantum group and Lee theory, to develop effective models of geometric representation, to investigate the representation of algebraic group, quantum group and relevant finite dimensional algebra, and to further enrich the Kazhdan-Luszig theory.

2. Manifold topology

Research contents:
1) Effective algorithm of computing homological ring and Chow ring related to Lee group and homogeneous space;
2) Computation of stable homotopy groups, cobordant theory and K-theory;
3) Hyperbolic structure of 3-manifold, knot invariant theory and incompressible surfaces and related problems.

3. Studies on several problems in the renormalization theory of homomorphic mapping

Research contents:
1) Characteristics description and parametric expression of renormalization transformation of homomorphic mapping;
2) Dynamics of transformation of integer function and algebraic renormalization;
3) Ergodic theory of homomorphic mapping;
4) Methods and relevant problems in dynamical systems of integer function theory.

4. Nonlinear elliptic and nonlinear parabolic equations

Research contents:
1) Qualitative theory of nonlinear elliptic and nonlinear parabolic equation(s);
2) Analysis of “blow up” phenomenon and singular sets;
3) Nonlinear elliptic and nonlinear parabolic equation and relevant couple equations in

natural sciences, engineering and social sciences.

5. Geometric invariants in string theory

Research contents:
1) Mirror image symmetry hypothesis;
2) Homological relation of quantum on K-equivalent algebraic manifold;
3) String Orbifold theory;
4) Relative Gromov-Witten invariant;
5) Localization techniques;
6) Open string and gauge field theory.

6. Bioinformatics and optimal methods

Research contents:
1) Problems in genetic engineering;
2) Prediction of protein structure and molecular connection;
3) Biological objects at system level;
4) Relevant problems of bio-information processing.

7. Several frontier problems in fractal geometry

Research contents:
1) Basic structures of fractals;
2) Analysis of repeated fractals;
3) Partial differential equations of fractals;
4) Some problems related to the application.

8. Mathematical theory, algorithm and application of self-adaptive processing of non-equilibrium signals

Research contents:
1) Convergence and complexity of self adaptive empirical module decomposition of signals, and two dimensional generalization and related theory, algorithm and application;
2) Nature of inner module function and its relation with Hilbert transformation;
3) Time frequency distribution: mathematical foundation of Hilbert spectrum and its application;
4) Intrinsic relation between empirical module decomposition and multi-scale analysis.

9. Linear and nonlinear numerical algebraic problems in scientific computation

Research contents:
1) Efficient algorithm and solutions for linear and nonlinear equations;

2) Numerical solution of inverse algebraic eigen values;
3) High precision algorithm of higher order algebraic equations;
4) Numerical methods of nonlinear least square problems;
5) Numerical methods for eigen values of structural matrices.

Division of Mechanics

Applicants can propose freely project titles, research contents, plans and funding in the following research areas. In 2006, 8 to 11 projects in the Key Program will be supported with an average funding of 2 million yuan per project.

1. Dynamical, vibration and control problems in major equipment;
2. Experimental studies on nonlinear dynamic properties of mechanical systems;
3. Multi-scale mechanical behavior and across scale relation of materials;
4. Mechanical problems of intelligent materials and structure and multi-field coupling effects;
5. Mechanical behavior of material and structure under abnormal environment;
6. Dynamical mechanical behavior and penetration resistant mechanism of materials;
7. New concept and new methods of turbulent structures;
8. Flow properties and mechanism of hypersonic cavity objects;
9. Ultra high temperature gas flows;
10. Dynamic models of abnormal particle multiphase flows;
11. Biomechanical studies related to the cause and cures of human diseases;
12. New theory and new methods of computational mechanics;
13. New methods and new techniques of experimental mechanics.

Division of Astronomy

Key Program projects in the Division of Astronomy are based on the priority areas proposed for the Eleventh Five-Year Plan period. Applicants may choose freely the project titles, research contents, plans and funding according to key scientific problems to be funded. Priority areas might change each year mainly depending on the distribution of Key Program project areas that have been funded. In 2006, the Division defines the following 3 areas, and plans to fund 3 to 5 projects with an average funding of 2 million yuan per project.

1. Galactic cosmology

Key scientific problems include:
1) Measurement of cosmological parameters, in particular, physical properties of dark matters, equation of state of dark energy and content, distribution, composition and properties of dark mater and dark energy, and observable phenomenon of residuals from early cosmic evolution;
2) Formation of various celestial bodies and structures in the universe, key physical process

of formation of structures;
3) Formation and evolution of galaxies, relation between the growth of super large mass black holes and the formation of stars in the host galaxy, especially the feedback process and its effects;
4) Radiation, structure and evolution of active nucleus of galaxy.

2. Formation, evolution and eruption of stars

Key scientific problems include:
1) Formation and early evolution of stars, especially the observation and theoretical studies on the formation of large mass stars and large scale formation of stars in galaxy;
2) Star structure and evolution and star atmosphere, late evolution of stars and compact celestial bodies and relevant high energy phenomenon;
3) Structure and evolution of the Galaxy and the observation and theory of formation, evolution of outer planets in solar system.

3. Astrometry and celestial mechanics

Key scientific problems include:
1) Theory and methods of astrometry and celestial mechanical development and the study of multi-band astronomical reference frame;
2) Planet and star system dynamics, including the structure and dynamic process in planet;
3) Natural and artificial celestial dynamics of the solar system;
4) Application of astronomy and astrometry in the study of the Galaxy;
5) Astrogeodynamics.

Division I of Physics

Key Program projects in the Division I of Physics are based on the priority areas proposed for the Eleventh Five-Year Plan period. Each year only part of them will be announced depending on the disciplinary development, distribution of Key Program project areas that have been funded before and budget available. In 2006, the Division plans to fund 8 to 11 projects, with an average funding of 2 million yuan per project. Applicants may propose directly project titles and specific research contents according to the areas to be funded.

1. Quantum transport phenomenon, self spin quantum phenomenon, super fine spectrum and interference optical properties of confined quantum systems

2. Physics of new functional materials

1) Physical properties of new artificial microstructure materials doped with Mott insulator and wide gap semiconductor materials;
2) Physics of efficient luminescent and photoelectric conversion materials;

3) Physical properties of new magnetic functional materials and their heterogeneous structures;
4) Physical properties of organic solid and organic/inorganic hybrid materials.

3. Novel phenomena in relevant electronic systems

1) Superconductivity mechanism of non-conventional superconductors and physical abnormality at normal state;
2) Special physical properties of strong relevant electronic systems, metal/insulator conversion and quantum phase change;
3) New physical problems in 2-D interactive electronic systems.

4. Physical properties of soft matter systems

1) Physical properties and laws of micro fluid flow;
2) Physical properties of particulate matter;
3) Nonlinear physical phenomena in complex system and exploration on physical laws.

5. Computation and simulation of matter structures and properties

1) Computational design and prediction of physical properties of new functional materials;
2) Computer simulation of properties of matter structures in complex systems and at extreme conditions;
3) New methods of material design and prediction of physical properties.

6. Cold atomic and molecular physics and applications

1) Physical properties of cold atomic and molecular systems;
2) Interaction of light and cold atoms and molecules and its applications;
3) Atomic optics and atomic interference;
4) Micro cavity quantum electrodynamics.

7. Complex interactions in atomic and molecular systems

1) Atomic and molecular properties under special environments (high temperature, dense and strong fields, etc.) and collision dynamics;
2) Relevance effect, super excitation state and quantum multi-body procedure control in molecules;
3) Physical properties and dynamics of size related clusters.

8. Generation, propagation and control of noise

1) Noise and vibration control theory in fluid-solid coupled systems;

2) Theory and methods of active control of structure sound;
3) Intelligent acoustic materials, low frequency sound wave absorption and isolation;
4) Theoretical models and computational methods of fluid dynamic noise;
5) Prediction models of environmental noise field.

9. Principle of high precision physical measurement technology and key equipment

1) Principle of high spatial and temporal resolution, high sensitivity characterization technology and development of key equipment;
2) Measurement and control of single atom and molecule.

Division II of Physics

In 2006, the Division plans to fund 8 to 10 projects, with an average funding of 1.9 million yuan per project. The following are titles and research contents of Key Program projects proposed.

1. Complex system dynamics based on complex network and studies on statistic behaviors

Research contents:
1) Micro description of transport dynamics on technical network such as the Internet; quantitative description and increase strategy for network information transmission capability; optimal design of network structure and efficient management, strategy for disaster resistance and attack resistance of network systems;
2) Network cascade dynamic model, study network overall topological structure and effect of grid local dynamical cascade behavior, various synchronization behavior of network and control strategy of network synchronization performance;
3) Taking reproducing statistical characteristics of real complex system as an object, it is to propose complex system model with network structure, including biological network model, earthquake model, economic statistic model, self-organization evolution model of complex adaptive system, and dynamics and statistical physics of synergic, gaming and coexistent behavior of these complex network models.

2. TeV energy zone physics

Research contents:
1) In-depth exploration on ways of discovering Higgs particle, super symmetry and super symmetrical particles on high energy collider, and their properties;
2) Other new physics models beyond the standard models;
3) Exploration and validation of new physical models by using the experiments to measure accurately the properties of top quark;

4) Computation and precision measurements of higher order radiation correction in standard models;
5) Proposing significant research topics for the experimentalists in China in cooperation with them.

3. Development of spectrum simulation system for the study of hadron physics on HIRFL-CSR

Research contents:
1) Developing event generator related to hadron physics on HIRFL-CSR in Lanzhou, providing the cross-section of generation, momentum distribution and spatial distribution of final state particles in related physical processes;
2) Developing simulation system framework, standard and software platform;
3) Developing simulation software for each sub-detection systems, describing in detail the geometric structures of detectors in each part, material media, relations and transportation of particles;
4) Some main physical objectives in detectors and the optimization of detector design;
5) The relationship between physical signals and various background signals, and the analysis of the feasibility of main physical objectives using developed CSR simulation software system;
6) Simulation system software needed by the physical analysis of future experimental data.

4. Hard probe signal generated by quark matter and collective effect

Research contents:
1) Interaction between molecules in high energy region and high temperature, high density quark matters;
2) Collective expansion property of quark matters;
3) Hadron theoretical models of quark matter.

5. Key physical and technological problems of ultra short pulse hard X-ray source based on Thompson scatterings

Research contents:
1) Physical process of the interaction between ultra short and ultra strong laser beam and high luminescent electron beams;
2) Generation, transport and focusing properties of ultra short and ultra strong laser, including its stability and measurement repeatability;
3) Generation, acceleration, compression, transportation and property measurement of high luminescent ultra short electron beam;
4) Synchronization technology for experimental study of scattering interactions of electron beam and laser beam;
5) Theoretical prediction and experimental measurement of photon generation amount in Thompson scattering.

6. New methodologies for the detection of narcotics and explosives

Research contents:
1) New principles and methods of detecting drugs and explosives;
2) High performance X-ray detection method, high speed 3-D imaging technology and analysis technology for dangerous materials;
3) New scattering detection methods, using low energy, small dosage X-ray detecting narcotics and explosives hidden in human bodies;
4) Development of fast and accurate narcotic and explosive detection systems.

7. Theoretical and experimental studies on the effect of spatial electric charges in hadron accelerator

Research contents:
Using domestic experimental facilities, according to the specific situation of high-density proton accelerator in construction, it is to conduct theoretical and experimental studies on the methods to increase beam density, such as spatial electric charge effect resulting from linear and nonlinear increase of beam emission rate and particle loss mechanism, etc., and ways to overcome such effects.

1) Generation, neutralization and injection technology of high luminescent, direct current and continuous wave negative hydrogen beams;
2) Spatial electric charge effect and beam loss mechanism in high density linear accelerator and beam transportation;
3) Comprehensive experimental techniques in the central region of high density cyclic accelerator and high frequency instability problems caused by high beam flow loading and high frequency digital control technologies;
4) Spatial electric charge effect in high-density synchrotron and beam loss control in injection, high frequency capture and acceleration process of beams.

8. Time resolution technique of synchrotron radiation and its applications

Research contents:
1) Synchrotron radiation pump-probe temporal resolution experimental techniques, key techniques including the synchronization and delay techniques of laser pulse and synchrotron radiation pulse, fast optical switch and fast spectrum reading techniques;
2) Experimental methods of synchrotron radiation temporal resolution, achieving high temporal resolution (micro second to nano second) refraction, scattering or spectroscopic application in experiments;
3) Validation of technologies and methods of temporal resolution experiments in real application.

9. Interaction of low pressure, multi-frequency plasma and material surface

Research contents:
1) Mechanism of generating low pressure plasma using multi-frequency, multi-electrode excitation discharge, and the effect of frequency coupling on the generation, confinement and transport of plasmas;
2) Experimental measurement and numerical simulation of matching the effect of different frequencies and power, and regulation behavior by energy and angles of ions hitting on chip surface;
3) Physical models of interaction between the discharge plasma and chip surface in providing scientific basis for the optimization of parameters in plasma etching and synthetic membrane materials.

10. Physical properties of fast Z pinch plasma

Research contents:
1) Development of theoretical models for the generation and development of filament loading fast Z pinch implosion plasma and X-ray radiation process, and related computer programs of numerical simulation;
2) Experimental studies on the physical process and radiation characteristics of formation, implosion and instability of single and double filament fast Z pinch plasmas, and matching conditions for pulse power driver and loading;
3) Advanced diagnosis techniques of X-ray background and X-ray characteristic spectrum tracer, exploring diagnosis techniques using fusion neutron diagnosis and plasma temperature, etc.;
4) Development of loading preparation techniques for fast Z pinch experimental studies, such as super fine and uniform metal filament loading, deuterate polymer fiber loading, etc.

Interdisciplinary Key Program Projects

1. Super fast and super strong optical physics (with the Department of Information Sciences)

1) Generation of atto second laser and ultra fast phenomena;
2) Optical physics of relativistic strong filed;
3) Extremely nonlinear optical phenomena of ultra short pulse;
4) Transport of ultra fast and ultra strong laser in media.

2. Micro-nano scale photonics (with the Department of Information Sciences)

1) New photon crystals and its integration and quasi phase matching;
2) Light transmission and control beyond refraction limit;

3) Phenomena of cavity quantum electro dynamics in photon crystals;
4) Surface plasma excimer physics.

3. Quantum information physics (with the Department of Information Sciences)

1) Physical problems on quantum information storage, transport, cloning, identification and measurement;
2) Physical realization of quantum bit, quantum entangle generation and measurement, principles and methods of quantum relay;
3) New principles and new methods of quantum computation.

4. New acoustic energy exchanger and arrays (with the Department of Information Sciences)

1) Acoustic energy exchanger array and modeling of acoustic fields;
2) New acoustic energy exchange materials and wide band, high sensitivity and large power acoustic energy exchanger;
3) Acoustic sensor such as MEMS and optical fiber;
4) Acoustic surface wave transducer measuring physical, chemical and biological quantities;
5) Energy exchange mechanism and technology for non-contact acoustic detection (electro magnetic ultra sound, laser ultra sound and electronic ultra sound).

Department of Chemical Sciences

During the Tenth Five-Year Plan period, there has been a major increase both in the number and funds of Key Program projects. From 2001 to 2005, 122 key Program projects were funded (not including those in the Major Research Plan). In 2006, the Department will publish guides and accept proposals in 40 research areas, and will support about 36 research areas from them based on competition. The funds for the following Key Program projects are in the range of 1.2 to 2.4 million yuan per project, while the actual amount will be determined according to the specific conditions. The duration of each project is generally four years unless stated otherwise.

Division I of Chemical Science

1. Metal-organic molecular functional materials;
2. Synthesis and performance of inorganic solid materials with complex mixed-valence;
3. Chemical basis of homogeneous preparing oxide-base functional materials;
4. Research on molecular magnetic materials;
5. Coordinated chemistry or inorganic solid chemistry freely proposed by the applicants;
6. Methodologies of system separation and determination of complex samples;
7. New methods of multi-dimension, multi-scale and multi-parameter analysis and

measurement;
8. New methods and techniques in the omics analysis;
9. Analytical methods and techniques orientated to the national security and human health.

Division II of Chemical Science

1. Catalytic reaction of chiral organic small molecules;
2. Organic synthesis methodologies on the basis of chemical bond activated;
3. Acting mechanism and environment behavior of new type pesticides;
4. Some new methods of chiral supported catalysts;
5. Whole synthesis of several oceanic natural products with biological activity;
6. Design, synthesis and property of novel organic conjugated molecules;
7. Reaction chemistry of organic compounds involved rare earth metals;
8. Synthesis and acting mechanism of cyclopeptides compounds;

Division III of Chemical Science

1. Theoretical research on molecular recognizing mechanism and of transfer processes of protons and energy in the biological systems;
2. New type of host-guest complex materials with mesopore as well as the regulation and control of their heterogeneous catalytic properties;
3. Basic research on non-zeolites solid-acid catalysts with high-performance;
4. Tectonic rules of ordered combiner of amphipathic molecules as well as their application in related areas of life sciences;
5. Super-fast kinetics of chemical reaction in non-adiabatic process as well as its theory;
6. Basic research of preparing hydrogen gas using imitative enzyme by solar energy;
7. Fundamental studies of electrochemical super-capacitor with high specific energy and related with it;
8. Molecular regulating mechanism of shift of energy and electrons in the photosynthetic bio-systems;
9. Chemical thermodynamics of equilibrium state or non-equilibrium state in the complex systems.

Division IV of Chemical Science

1. Functional shell-type polymers;
2. Synthesis of new alkyne polymers as well as their structures and properties;
3. Motion, conformational switching and mechanism of polymer chains in the pre-crystallization;
4. Basic issues of CO_2 copolymers;
5. Design and adsorption mechanism of functional polymers with high-selective adsorbed and separated bioactive substances;

6. Environmental behavior and interfacing reaction of air particles and the effect to health;
7. Shift and conversion rules of persistent toxic organic pollutants in soils and their influence to underground water;
8. Biochemical reaction of rare-earth elements and their intervention to chemical processes in cells.

Division V of Chemical Science

1. Science and engineering foundation of key technologies in the areas of biological and medical engineering;
2. Key chemical engineering basis on high effective clean utilization of fossil energies and control of their green gases emission;
3. New theories and technologies of the reinforcement and integration of processes;
4. Scientific and technical bases of green and environmental chemical engineering;
5. Chemical engineering basis on the preparation and application of advanced functional materials;
6. Basic problems of chemical engineering in the development of renewable resources and the cyclic utilization of resources.

Department of Life Sciences

The Key Program is an important component in the funding structure of NSFC. Aiming at problems in the project selection and application processes in the past, such as long period of project planning, limited research scope, insufficient linkage with other projects supported by NSFC, the Department has tried a model of combining conditional free applications (FA) with application in designated areas (DA) for the last 3 years, and based on this background and considering the different characters of each division, the Department adjusts properly the Key Program supporting plan in 2006 in the applications of DA and FA, and there are 6 divisions which only receive applications of DA and do not receive the "conditional" FA. Applicants should read the support plan of each division in 2006 listed below carefully and in detail, and correctly fill in the corresponding application code lined out in each division when applying. They will not be evaluated unless the applications of Key Program projects follow the funding plan published in the *Guide to Program*. The application requirements for DA and FA Key Program projects to be noticed are listed below:

1. Key Program projects in designated areas

For designated areas, applicants should propose research titles and compose application texts in reference to the guidelines issued by the Department in 2006. In the column of "Annotations" on the basic information table of the application form, applicants should write down applied research areas.

2. Key Program projects for conditional Free Application (FA)

Applicants who have achieved great progress, such as new discoveries, new theoretical hypotheses and new techniques and methods with important scientific significance, and need intensive support to further the research, can apply directly for (Conditional Free Application) Key Program projects. Applicants for this category should specify with "Free Application Key Program Projects" in the column of "Annotations". Moreover, a statement with about 800 words on the important innovative progresses achieved is required in addition to the routine application text for free applications. On this statement, the applicant should elaborate the concrete content of the important innovative progress; important result concerning the progress achieved and papers published in international academic periodicals, by providing the details of author's name, paper titles, publication dates, publication's issuing number, page number, etc. For papers representing the "achieved important progress" of the application, they must be published in recent years, and the applicants must be the first author or corresponding author.

3. Applicants for Key Program projects (including applications in reference to designated areas and conditional free applications) are required to annex the first pages of five representative papers attached to the application texts.

In view of the problems existing in the previous applications for Key Program projects, the Department particularly reminds the applicants in 2006 to avoid any cases listed below. Otherwise, the proposals will be rejected in the format examination:

1) Application which does not specify the research area or "free application" in the column of "Annotations" of the basic information table in the application text;
2) For Free Application Key Program, the applicant does not provide the statement with about 800 words of the achieved important innovative progress;
3) In case of the Free Application Key Program, the applicant cannot provide enough materials to prove that important progress has been achieved, or the papers are not recent publications, or the applicant is not the first author or corresponding author;
4) Applications with research contents overlapping obviously with that of the projects already funded by the National "973" Plan, "863" Plan, or NSFC Major Program and Key Program.
5) To apply free application Key Program projects on the subjects which do not accept conditional FA in 2006 (such as agricultural science, animal husbandry, veterinary science and aquatic science, preventive medicine, basic clinical medicine I and II, traditional Chinese medicine, and Chinese materia medica).
6) Applicants who are working abroad and could not put most of his/her time and energy to work in China.

In addition, in view of the problems existing in the previous applications and examination, the applicants should pay attention to the following details when composing their application texts:

1) In the column of resume, detailed information concerning the applicant and members of the group is needed, such as employment, education, projects funded before, results of fulfillment and related papers. Papers published and in press should be listed separately. As for the papers published, it is necessary to list all the authors, titles of the papers, publication dates, periodical numbers and page numbers, and books, abstracts of papers and conference papers should also be listed separately.
2) The applicant is required to explicitly present the earlier groundwork related to this application, the experimental evidences for the new suppositions and new hypothesis, and papers published. As for those who have not yet published papers, they are required to present the related experimental data, such as photos, paradigms and so on.
3) The research plan, technological processes and methods in the application texts are import items for experts to evaluate the feasibility of the project. Therefore, the applicant should present an application text with a precise experiment plan and correct technological route to avoid curtness and vague by all means. It is suggested that there should be one scheme in reserve in case of some key technique scheme failed. Such scheme will be also reviewed.
4) The applicant applying for projects which have already been funded by the National "973" and "863" Plans and NSFC Key Program or Major Program should present the differences between them in the application text.
5) Concerning proposals touching upon medical ethnics, the applicant should give the certification of ethic committee from his/her host institution or college, or from the superior administration. As for the research using genetically modified organisms, the proposal should give its source, and if it needs donation from other laboratory, the certification from the laboratory is needed.
6) For the application concerning international cooperation or team members sojourning abroad, it should offer the agreement or protocol for the international cooperation, or the affirming certificate by the members sojourning abroad.

For such applications which do not meet the demand of filling in proposals, or do not offer materials needed, the Department will not fund them.

In 2006, the Department will allocate 110 million yuan to support about 76 Key Program projects, of which 46 are DA projects and 30 are conditional FA projects. The average funding will be not lower than 1 million yuan per project. So the applicants should offer reasonable budget clearly according to the real necessity of study. Moreover, the duration of Key Program projects is 4 years in general.

The supporting plan and designated areas for Key Program in each division in the Department of Life Sciences in 2006 are as follows:

1. Microbiology (4 projects)

Designated area: Basic research relating to important pathogenicity bacteria (2 projects).
Free applications: 2 projects.

2. Botany (4 projects)

Only free applications are accepted.

3. Ecology (3 projects)

Designated area: Bio-rehabilitate mechanisms of damaged ecosystem (2 projects).
Free application: 1 project.

4. Forest science (3 projects)

Designated area: Basic research of forest development (1 project).
Free application: 2 projects.

5. Biochemistry, biophysics and molecular biology (5 projects)

Only free applications are accepted.

6. Genetics and development biology (4 projects)

Designated area: Nun-coding RNA and its function (2 projects).
Free application: 2 projects.

7. Cell biology (4 projects)

Designated area: Molecular mechanism study of cell movement (2 projects).
Free application: 2 projects.

8. Immunology (4 projects)

Designated area: Basic research of immune tolerance (2 projects).
Free application: 2 projects.

9. Neuroscience and psychology (4 projects)

Designated area: Mechanisms study of cognizance (2 projects).
Free application: 2 projects.

10. Biomedical engineering (3 projects)

Designated area: Theory and methods of acquiring and resolving biomedical information (2 projects).

Free application: 2 projects.

11. Agricultural science (4 projects)

Designated area:
1) Mining of excellent gene resources and research of important properties of "small crops" (other food crops except rice, wheat and maize) (2 projects);
2) Basic research of crop products safety (2 projects).

12. Animal husbandry and veterinary science and aquatic science

Designated area:
1) Mechanisms of zoonose infect and spread crossing species between human and animals or between animals (2 projects);
2) Basic research of important breeding freshwater fish resources (2 projects).

13. Zoology (4 projects)

Designated area: Cell and molecular basis for the development of animal procreate and development (2 projects).
Free application: 2 projects.

14. Physiology and pathology (6 projects)

Designated area: Pathogenesis of relating diseases of non-infectious inflammation (3 projects).
Free application: 3 projects.

15. Preventive medicine (4 projects)

Designated area:
1) Mechanisms of damage caused by environmental chemical pollutants (2 projects).
2) Pathogenesis and pathogeny of chief endemics (2 projects).

16. Basic clinical medicine I

Designated area:
1) Collection of important disease pedigree and related basic research (2 projects).
2) Basic research on the occurrence and prevention of defects of vision system and common diseases (2 projects).

17. Basic clinical medicine II

Designated area:
1) Basic research of early diagnosis of malignancy (2 projects).
2) Basic research on the occurrence and prevention of important oral diseases (2 projects).

18. Materia medica and pharmacology (4 projects)

Designated area: Basic research of drug resistance (2 projects).
Free application: 2 projects.

19. Traditional Chinese medicine and Chinese materia medica (4 projects)

Designated area:
1) Mechanisms of special connection between acupoint and the target organs (2 projects).
2) Pharmacodynamics of truly curative effect Chinese traditional medicine including compound (2 projects).

Department of Earth Sciences

Key program projects, funded through open competition under the *Guide to Programs*, are an important part of the funding system of NSFC. Since 2002, the Department of Earth Sciences announces guidelines of Key Program projects according to the major issues in the priority funding areas. In addition to these guidelines, applications can be submitted for Key Program projects if they are related to key issues in scientific frontiers and have made important progress in the previous projects.

Within the following specified areas, applicants are free to determine the research topics, goals, technical approaches and funds needed on the basis of summarizing research work carried out both domestically and internationally and stating clearly the new breakthrough points and ways for the research.

In each proposal, applicants must state in detail their previous research work related to the applied project. Applicants must also provide their résumé and co-PIs, as well as their former projects granted by NSFC and the main results and publications.

In the proposal sheet, applicants need to fill in the relevant area in “Annotations”, and address key issues and contributions to the area. To avoid duplication in funding, applicants should state clearly the relations and differences of the research with related projects funded by other agencies. Besides Chinese, English version of the application is encouraged.

An annual workshop will be held with the participation of principal scientists for each

research area in order to strengthen the communication and exchange of academic ideas and information, and to promote the formation of new research groups and integration of multidisciplines. Expenses for this meeting should be included in the budget of the application. For the realization of the overall scientific goals and the integration of multidisciplines, principal investigators should obey the corresponding stipulations on data and research materials.

Interdisciplinary researches have become the fertilizers for innovative ideas and original innovation. It is expected that scientists from various disciplines of earth sciences, and scientists from other research areas such as mathematics, physics, chemistry, biology, materials and engineering sciences, information sciences and management sciences jointly submit applications for the Key Program projects of the Department. The code for interdisciplinary study should be filled in on the application form.

In 2006, the total budget for Key Program projects will be around 50 million yuan for 35 projects, 1.0 to 1.8 million yuan per project on average. The research period of a project will generally be 4 years.

1. Global change and the Earth system

As environmental issues become an increasing concern, research on global changes has been an international scientific activity attracting extensive attention from the governments and public all over the world. The future research will lay stress on the global carbon circulation, water circulation, food system and environment health, etc., and will highlight the strategic layout of intercrossing between natural and social sciences and global and regional interaction in the research of global changes. The main idea is to take a number of global change sensitive areas in the Eastern Asia continent, ocean and polar region as research objectives, focus on carbon-nitrogen circulation, water circulation and monsoon environment evolution, to study the ocean-continent-atmosphere interaction and the mechanism of impact of human activities on regional environment change with the viewpoint of the earth system, to acquire ways and processes of response, interaction processes, dynamic mechanisms and its future trends, and to develop global change science system for providing a scientific basis for the national standpoint on water security, ecological security, food security and international conventions.

Key scientific issues to be emphatically studied are:
1. Geochemistry circulation of marine biology, ecosystem and biodiversity;
2. Impact and responses of Asian monsoon environment system on global changes;
3. Processes of environmental changes in plateau and polar areas and its relation with the environmental changes in East Asia;
4. Interaction between land and sea and environmental evolution in estuarine coastal areas;
5. Forecast of global and regional climate and environment.

About 3 to 5 proposals will be supported.

2. Environment and life processes on the Earth

The Department emphasizes the support to research in intercrossing frontier areas between earth science and life science to explore basic scientific issues targeted at historical and modern environmental influence on the life processes, life-process feedback to the environment, and the coordination of the two elements. Research contents should highlight the logical combination of the earth environment and life process. The intercrossing and permeation in research contents and methods between earth science and other related subjects are strongly encouraged, and proposals from life science and other related disciplines are welcome.

Key scientific issues to be studied include:
1) Form, process and mechanism of bio-radiation and bio-extinction events and the origin of biodiversity;
2) Terrestrial life system, biological evolution and environment change in Mesozoic and Cenozoic eras;
3) Origin, body evolution and survival of paleoanthropology and Pleistocene environmental change;
4) Environmental biogeochemical circulation and ecological effect of chemical materials;
5) Ecological toxicology and regional risk of poisonous pollution materials.

About 4 to 6 proposals will be supported.

3. Physical dynamics of weather and climate system

The general goal of this project is to understand various weathers and climatic spatial-temporal characteristics, laws underlying the change, interrelation and physical mechanism determined by the movement rule of coupling climate system of atmosphere-ocean-continent interaction, as well as the middle-level and high-level atmospheres and various physical, chemical and biological processes impacting on these processes in the underlying surface and boundary layer, and to conduct theoretical and predication research on the climate change and living environment change based on the models of ocean-continent-atmosphere interaction with high resolution and high precision. In order to realize the above-mentioned goals, new principles, methods and equipment on atmospheric sounding should be strengthened in a long period of time in the future, including the manufacture of new sensors and platforms, and the inversion and application of satellite and radar remote sensing.

Key scientific issues include:
1) Physical and chimerical processes of aerosols and trace gases in climate system;
2) The dynamic process of meso-scale severe weather system and forecasting theory and methods;
3) Stratospheric processes and interaction with troposphere as well as their climatic and environmental effects;
4) Observational and theoretical studies of the energy and mass exchange processes between

ground surface and atmosphere.

About 3 to 5 proposals will be supported.

4. Continental dynamics

The main research goal in the area of continental dynamics is by applying multidisciplinary methods to explore the geological, geophysical and geochemical features of the continent in China, to correlate the continent with adjacent areas in Asia and other parts of the world, to understand the three-dimensional structure of continental crust-mantle system in China, to reveal the main accretion and subduction processes of continental materials, and to establish the dynamic conceptual and quantification models for the Mesozoic-Cenozoic evolution of the East Asia continent in order to provide innovative prognostication and evaluation theories for resources exploration, hazard mitigation and environment protection.

The following studies are encouraged:
1) To obtain reliable data or to make significant discoveries in key scientific issues by applying comprehensively new technical means such as the precise field geological observation, geophysical exploration, high-precision qualitative examination of major geological events, geochemical tracing, etc.;
2) To analyze all kinds of geological, geophysical and geochemical data with new thoughts and to construct conceptual models of continental dynamics and to carry out numeral simulation;
3) To conduct effective international and regional cooperation, to encourage particularly comparative study with relevant countries concerning the scientific goals of the projects, and to participate energetically in international competition.

Key scientific issues to be studied include:
1) Continental lithospheric evolution and metallogenesis in East Asia;
2) Tectonic transition in East China and marginal sea during Cenozoic;
3) The recycling of the continental lithospheric materials and the accretion and breakdown of the continent;
4) Tectonic processes during Cenozoic and their environmental and hazardous effects.

About 4 to 6 proposals will be supported.

5. Regional sustainable development

In the field of regional sustainable development, aiming at scientific issues which play important roles in the implementation of sustainable development strategy, integrated researches will be conducted to explore the models for social, economic and ecological sustainable development in typical regions and to provide scientific bases for the regional sustainable development by focusing on the theory and methodology of regional sustainable development and with a view to the harmony among the population, resources, environment

and development.

Key scientific issues to be studied include:
1) Assessing theory and method for regional sustainable development;
2) Constraint mechanism and development models of urbanization;
3) Urban landscape pattern and its ecological/environmental effects;
4) Spatial heterogeneity of regional resources and hazard risk, and its sustainable development;
5) Industrial transformation and its regional effects.

About 4 to 6 proposals will be supported.

6. Solar terrestrial space environment and space weather

The general goals of research on solar terrestrial space environment and space weather are: 1) to form an integral theoretical framework of chain reaction process on the space climate and to achieve important innovative progress with high international impact based on the research of space weather processes at various scales of the solar terrestrial system; 2) to establish the cause effect model of space weather events in the solar terrestrial system and to develop comprehensive forecast methods based on the physical forecast; 3) to promote extensive intercrossing and interpenetration with other disciplines, especially with mathematics, physics, information science, materials science and life science, and to conduct studies of space weather effects on human activities in an attempt to provide a scientific basis for the protection and decision making by agencies concerned; 4) to develop new concepts and new methods on space weather probing, and to put forward new plans of series satellites for space weather purpose.

Key scientific issues to be studied include:
1) The driven sources of space weather;
2) Basic processes in space plasma such as magnetic reconnection, particle acceleration and wave-particle interaction;
3) The coupling of magnetosphere-ionosphere-upper atmosphere and its comprehensive observation;
4) The composite forecast models of space weather and its modeling;
5) New concepts, new principles and new methods of space weather survey.

About 3 to 4 proposals will be supported.

7. New principles and technology on the analysis of the earth system

It has shown by the evolution history of geoscience that the development of high technology has created significant conditions for the breakthrough of major problems in geoscience. The progress of new detection and analysis technology is always the technical guarantee for the source of innovative ideas in geoscience. Therefore, in view of the major scientific

issues confronted when researching and developing geoscience, the exploration of new theories, methods and technologies of the observation and analysis on the earth system must be further strengthened so as to provide new methodologies for the research of fundamental problems in geoscience.

Key scientific issues to be studied include:
1) New principle and technology of terrestrial detection;
2) Technology of integration of geospace, virtual reality and simulation;
3) New theory and detection of technology of the atmosphere, ocean and terrestrial surface layer;
4) New theory and new technology of deep earth detection;
5) New theory of high-precision measurement and analytical methodology.

About 3 to 5 proposals will be supported.

Department of Engineering and Materials Sciences

In 2006, the Department plans to support 38 Key Program projects with a total funding of up to 70 million yuan, according to the strategic planning of the Department and the funds for Key Program in the Eleventh Five-Year Plan period.

Division I of Materials Science

1) Intrinsic brittleness of ultra-high temperature intermetallic compounds as structural materials and their strengthening and toughening;
2) Advanced hydrogen-storage metallic materials and their hydrogen storage mechanism;
3) Phase diagram, thermodynamic model and alloying principles of magnesium based alloys;
4) Fundamentals in metastable metallic materials (free application area);
5) Key scientific problems in multifunctional composite (free application area).

About 4 to 5 projects from the above topics will be supported.

Division II of Materials Science

1) Phase-diagram, materials processing and microstructure controlling for ultra-high temperature ceramics;
2) Fundamental issues related to silicon-based electro-luminescence materials;
3) Key fundamental issues in degradable bioactive ceramics or materials for the repair and regeneration of bony tissues;
4) Design principle, processing and applied research on nano-carbon materials for energy

storage;
5) Key fundamental issues on inorganic non-metallic materials involved in proton-membrane full cells;
6) Fundamental issues related to inorganic non-metallic meta-materials;
7) Free applications in the field of inorganic non-metallic materials;

About 4 to 6 projects from the above topics will be supported.

8) Basic issues of the implementation of high performance of general polymer materials and special polymer materials;
9) Basic issues of polymer-based composites and hybrid polymer materials;
10) Functional materials: basic and applied basic researches on the controllable preparation of organic polymer materials with optic, electronic, magnetic, separate and absorbable properties;
11) Basic research of polymer materials related to life science;
12) Basic research on polymer materials related to environmental science, energy resource science and resource utilization science.

About 3 to 4 projects from the above topics will be supported.

Division I of Engineering Science

1) Resource recycling and the re-utilization of metallurgical wastes;
2) Basic theories and its application on green mining;
3) Fundamental studies on improving recovery rate of petroleum in lower penetrating layers;
4) Intellectualized materials preparation and forming techniques;
5) Control theories and techniques on ultra-fine microstructure of powder metallurgy materials;
6) Theory and principles of novel metallurgical reactor.

About 3 to 4 projects from the above topics will be supported.

Division II of Engineering Science

1) Theories, methods and technological research on electromechanical facility innovation design based on resource saving;
2) Basic research on advanced near forming manufacturing technology with energy-saving and high efficiency;
3) Theories and methods of modeling simulation, running optimization and intelligent maintenance of complex mechanical system;
4) Basic research on micro special processing and micro facility manufacturing technology with self-innovation;

5) Early damage, fracture and failure mechanisms of significant mechanical structure, theories, technologies and method research on safety running and postpone lifetime of mechanical system;
6) New principles and technology research on large size precise measurement on field;
7) Research on new principles of mechanical bionics, design theories and manufacturing methods of bio-simulation mechanics.

About 5 to 6 projects from the above topics will be supported.

Division III of Engineering Science

1) Research on multi-dimension transport phenomenon and transport mechanism;
2) Research on non-equilibrium fluid thermophysical properties;
3) Research on diesel-engine combustion theory and combustion control;
4) Research on supersonic combustion and flow;
5) New methods and new techniques of measurement in complicated fields of thermophysical properties.
6) Free application of Key Program projects concerning renewable energy utilization in the field of engineering thermophysics.

About 4 to 5 projects from the above topics will be supported.

Division IV of Engineering Science

1) Regional energy efficient buildings for residence;
2) Base research on the technology of water quality transform and security insurance in urban water-cycle process;
3) Base research on the disaster prevention of power transmission tower-line complex structure system;
4) Base research on the security of large-scale building for explode-resistance;
5) Free application in the field of “New space structure system” by the Division;
6) Free application in the field of “Urban transport system planning” by the Division.

About 4 to 5 projects from the above topics will be supported.

Division V of Engineering Science

1) Marine soil’s characteristics and its engineering deformation;
2) Characteristics and control of agro-chemical transportation and transformation in irrigation;
3) Deepwater mooring system of ocean engineering;
4) Basic research on high-performance electric actuators based on new functional materials;

5) Basic research on new electrical approach and mechanism for cancer treatment;
6) Key issues on fast discharge and load directly driven pulsed power technology;
7) Key issues on medium and/or high power, high-speed motor/generator systems.

About 2 to 3 projects from the above topics will be supported.

Department of Information Sciences

The Department of Information Sciences will fund 26 Key Program projects (including interdepartmental projects to be received by the Department) in 2006. The average funding is about 1.8 million yuan per project. The actual funding for each project may vary according to the contents and objectives of the projects. Only research areas of the Key Program are given in the *Guide to Programs*, and research objectives and contents are to be determined by applicants.

Division I of Information Science

1. Theory and technology of end-to-end reconfiguration in hetero wireless networks

2. Basic theory and experimental platform for application of video signal processing in network environment

Fast development of and close linkage between digital broadcast and television network, the Internet and wireless mobile network require video signal to be transmitted in multiple networks. Compression of video signal must be converted with high transparency according to the characteristics of network, and achieve best visual quality at the same frequency bandwidth. This project aims at studying video processing platform for hetero environment, and exploring natural characteristics of sensing high compression ratio by human eyes, and realizing intelligent coordination of video processing adapted to the network and physiology factors.

Main research contents:
1) Multi scale adaptive structures;
2) Optimization of gradually increased rate distortion;
3) Video processing technology based on active vision;
4) Perception based video encoding.

3. Theory and key technologies for the identification and analysis of high dimensional information

Identification of higher dimensional information (i.e., image and video) is crucial to national security and public safety. This project aims at developing the theory, algorithm and key

technologies for dimensional compression for identification purposes, addressing the major national needs such as financial safety, security monitoring, etc., and developing relevant prototype verification systems.

4. Key technology and experimental platform for optical packet switching

In accordance with the development of optical switching technologies and addressing the needs of next generation network services, this project emphasizes on studying optical packet switching technologies, exploring optical signal packet switching, optical marker processing, key theories and cutting edge technologies such as optical switch function for packet broadcast and net work intelligent management, and developing experimental verification and demonstration platform.

Main research contents:
1) Optical packet switching technology based on optical marker or new total optical packet switching technology;
2) Control of optical packet switching in network;
3) Optical switching element technology for group broadcasting;
4) Integrating requirements on quality optical switching network services on existing network, video media and storage regional network, develop practical prototype of typical optical packet switching network.

5. Theory and key technologies of real time passive millimeter wave imaging

Passive millimeter wave imaging detection technology can work in all weather conditions and around the clock as well as penetrating non-metallic materials of certain thickness, so it has wide range of application in anti-terrorist, scenario monitoring and military intelligence. This project aims at studying the basic theory of millimeter wave radiometer focal plane array passive imaging, imaging algorithm and prototype system, so as to provide theoretical and technical support for research in the areas of millimeter wave passive real-time imaging technology.

Main research contents:
1) Theory and key technology of detection based on millimeter wave radiometer passive real-time imaging;
2) Theory and key technology of millimeter focal plane array reception and real-time imaging;
3) Theory and technology of radiometer imaging high resolution signal processing;
4) Radiation property of millimeter wave band of environment and targets.

6. Electromegnetic field theory and key technology of radio frequency system-in-package

Fast development of wireless communication services requires small scale, low energy

consumption and high reliability systems. Theory and key technologies of multi-functional integrated radio frequency (RF) system-in-package (SIP), hence become hot spots in research. This project aims at providing theoretical and technical bases of system design and integration technology for radio frequency system-in-package.

Research contents involve multilayer stacking 3-D passive RF SIP element and precision modeling and parameter acquisition through connection wire; techniques of optimizing configuration and structure of connection wires to reduce RF SIP electro magnetic loss, parasitic parameter effect and electromagnetic noise, etc., the development of new EDA design methods of reducing power loss of connection wire; the study of high accuracy, high efficiency 3-D electromagnetic emulation technology and system design and integration technology; RF SIP prototype unit, and relevant theory and key technology.

Division II of Information Science

1. System structure of highly effective parallel computer

It is to develop new parallel computation model and storage model, design balanced consumption, and increase practical effective performance of large scale parallel computation systems in order to meet the demand of high end applications.

Main research contents include:
1) Re-configurable high performance computation grid system structure;
2) Highly effective storage system structure;
3) Scalable technology for large scale system;
4) Low power consumption design technology for large scale system;
5) Efficiency evaluation models and methods.

2. Credible mobile internet theory and application

It is to develop theories and methods to describe effectively credible mobile internet system structure with the consideration of grid node resources, homogeneous and heterogeneous node movement behavior, to develop routing theory and protocol algorithm for mobile Internet with the consideration of the viability, scalability and security of credible network, and to study the packet broadcast protocol and algorithm in new environment in order to meet the need of next generation Internet.

Main research contents include:
1) Theory, protocol and algorithm of credible mobile internet routing protocols;
2) Packet broadcast theory and algorithm in credible internet;
3) Viability, scalability and security mechanism of credible internet;
4) Develop preliminary prototype system of credible mobile internet applications.

3. Key technology and evaluation methods for the safety of digital media content

With the application of digital media as objective, this project will study methods and key technologies for the copyright protection, authentication and safety evaluation of digital media.

Main research contents include:
1) Encryption, authentication and digital signature methods applicable to digital transport and service;
2) Safe digital image, audio and video water marks, and digital water mark of geometric shape that resists geometric attacks;
3) Image, video and audio authentication based on fragile water mark passive image alteration, analysis and detection based on statistical analysis, content based image alternation detection tools;
4) Principle, technology and methods for evaluation of digital media content safety.

4. Digital VLSI circuit test technology

Main research contents include:
1) Time delayed test technology for VLSI circuit;
2) Multi clock circuit test technology including instruction based CPU testing technology;
3) Compression and decompression node design and test arrangement.

Division III of Information Sciences

1. Industrial process control for energy saving

2. Online identification and estimation of dynamic models of movable objects

3. Basic theories and methods for the detection control and operation of nanometer scale objects

Addressing the needs of processing, assembly, etc., of nanometer scale objects, it is to study mainly the kinematical and dynamical models of objects in nanometer environment, based on the theory and methods of detection and driving technologies, non-inertial force, micro- and nano-meter scale displacement, key technologies of micro nanometer scale operation and visual interface. Research results need to be verified on micro nanometer scale operation platform or on prototype system.

4. Modern design theory and methods of engineering and products

According to the characteristics of openness, coordination, heterogeneity and variability

of engineering and production design in network environment, it is to study mainly theory and methods of intelligent design based on knowledge, 3-D reconstruction theory and methods based on 2-D information, new theory and new methods of coordinated design in network environment, formalization methods for modern design software system and relevant problems. Research results should be verified in relevant systems and partly applied in the modern design of some engineering projects or production.

5. Key technology for underwater mobile sensor network

Addressing problems in underwater perception and object identification, it is to study mainly the design and motion control of underwater mobile units perception system, mobile sensor network communication and information processing, mobile sensor network topological structure self organization configuration and spatial distribution control. It is needed to develop experimental platform of underwater mobile sensor network and verify results of the above-mentioned research.

6. Several important problems in machine learning

Addressing common problems of machine learning in different disciplinary areas, it is mainly to study new methods of machine learning for effective processing of high dimensional data, unbalanced data of various types, processing of cost different data, data type unmarked data and structured data. Part of the research results need to be verified in application.

7. Basic theory and methods of highly effective, scalable video encoding and decoding

Addressing the characteristics of heterogeneous transmission network, fluctuation of transmission bandwidth, varying terminal display type, concurrent service needs and service quality, etc., of the next generation video frequency encoding and encoding requirement, it is to study mainly the basic theory and key algorithm of wavelet based and statistical learning, scalable video encoding and decoding system structure and network transmission technologies, scalable video frequency encoding and decoding key algorithm and hardware technology. Research findings should be verified in relevant experimental systems.

Division IV of Information Science

1. Key technology of nano scale CMOS integrated circuits

Addressing key problems in CMOS integrated circuits after technologies now reaching the 65 nm range, it is to study mainly new principles, new structures and novel methods of integration technology related to channel engineering and grid engineering, so as to lay the foundation for developing large scale integrated circuit with proprietary intellectual property right.

2. Basic research on the preparation of high quality zinc oxides (ZnO) crystal

It is to prepare high purity, low defect density and large size zinc oxide single crystals, to study the crystal growth mechanism and control technology defect form, structure and formation mechanism, and influence on epitaxial membrane.

3. Key technology and system of high optical fiber laser

Interdepartmental Key Program projects

1. High power laser emitted by vertical cavity wall (with Division I of Physics)

It is to study related physical problems of vertical wall emitted high power laser and array module, to solve key technical problems in structure design and device production, and to develop high continuous output power and long life span laser and array modules.

2. Optical property and optical devices of nano micro structure materials (with Division I of Physics)

It is to study the laws of emission, transmission coupling and nonlinear behavior of light, the abundant physical effects and contents thus induced, and on this basis to develop the design and preparation technology which may be used for nano microstructure devices.

3. Basic studies on ultra fast laser propulsion technology (with Division I of Physics)

It is to study the physical mechanism of using ultra fast laser pulse propulsion, including studies on the basic physical process of interaction between ultra fast laser and matter, to develop physical models of interaction directly related to laser propulsion, to study by experimental methods the effects of laser parameters and physical properties of the object being propelled and structure parameters on energy conversion efficiency, specific impulse and momentum energy ratio, to study the feasibility of small scale, small mass propulsion and large scale and large mass propulsion, and to explore practical solutions to high efficiency laser propulsion.

4. Applied research on marine optical telemetry information (with Division I of Physics)

It is to study the methods to invert distribution of marine parameters such as marine internal wave, shallow water topography and geology, under sea objects, marine bubble and halonereid using optical telemetry information such as water measurement, multi spectrum measurement, high spectrum measurement, etc., and using the methods of inversion by experimental verification to study the intrinsic relations between optical telemetry

information and relevant marine parameters, so as to promote the development of marine optical telemetry technology.

Department of Management Sciences

According to the Eleventh Five-Year Plan, the Department will support 9 Key Program projects in 2006, of which, 6 by the Division I and 3 by the Division II. Each project should be completed within 4 years, and the average funding of Key Program projects supported by the Department is about 0.9-1 million yuan per project.

Key Program projects are to focus on the frontier research areas to promote the scientific development or to resolve real problems in management practice. Applicants should abstract the rules and theories of management with Chinese features.

Applicants, guided by the Guide, may compress or expand the research contents in preparing their proposals. It is not required that for a specific proposal all contents stated below have to be covered, but research should be focused on kernel topics with limited targets, trying to make original innovation. Previous research records in relevant fields will be highly considered in evaluating proposals.

The brief introduction to the Key Program projects is presented below.

Division I of Management Science

Management science and engineering

1. Management and optimization of urban transportation networks

In order to forecast travel demands in Chinese cities and develop various optimization models and management technologies with respect to comprehensive urban transportation networks, the main topics are origin-destination matrix estimation, static, dynamic and stochastic traffic assignment models, city transportation network design model, transfer model between different modes, the evolution model of network flow pattern, and efficient solution algorithms. Other topics can be the methods of evaluating urban transportation systems, and the management and control technologies of alleviating traffic congestion.

2. Group decision theory and methods

Proposals are encouraged to focus on the topics such as complex and large group behavior in the context of group decision making, procedures and methods of group decision problem solving, design and choice of group decision mode, group decision process and its design,

complex and large group decision method, internet-based group decision support system, and the evaluation of group decision effectiveness including quality, effectiveness, etc..

3. Basic theoretic researches on organizational psychology and social security

Based on the characteristics of mentality and behavior of the public when facing sudden crisis, it is to develop the in-depth theories of social security analysis and the intervening and coping tactics investigation. The theories should reflect the features of Chinese culture and achieve a directional significance in the sudden crisis management system in China. The main contents of research should include the risk perception characteristics of public toward crisis events, the relationship between the availability of information on crisis events and the mentality and behavior of the public, mental preparation under normal states on mentality and behavior in crisis events, a model of mental prediction when sudden crisis events outbreak, the interfering systems of sudden crisis based on the characteristics of the public mentality and behavior, and so on.

Business administration

1. Some fundamental issues on researches of corporate finance

To conduct further studies on some puzzles in corporate finance with financial management practices in China, research issues include financial policy selection or determination, the assessment of financial performance and policies, internal capital market, corporate governance and financing and investment decisions, investment and performance, financial management based on value-creation, behavior finance and so on.

2. Assessment theory and approaches on legal protection for investors

This research project includes the implication of legal protection for investors and its meanings to China, the forms on legal protection for large shareholders with control power and small-middle shareholders, the relationship between corporate governance and legal protection, the relationship between legal protection for investors and financial policies, the relationship between legal protection and financial performances, and the assessment approaches for legal protections.

3. Basic research on branding and brand management

The proposal aims to promote innovative research on branding and brand management from both consumer and firm perspectives in the context of the Chinese market. Key research topics include the brand's influence on consumer behavior and its functioning mechanism, brand equity, its constituent components, determinants and evaluation models, the relationship between brand strategy and firm performance, brand management and product innovation, the competitive analysis of local and foreign brands, and the globalization of Chinese brands and their implementation strategies.

Division II of Management Sciences

Macro management and policy

1. Farmland system reform and issues of social security concerned in the process of urbanization

It is to study the issues facing the existing farmland systems, especially the farmland acquisition and contracting systems in the process of accelerating urbanization, including the farmland acquisition mechanism, compensation, employment and social securities of landless farmers, social security, household registration and issues related to the farmland under the existing financial and administrative systems, to explore the internal relations among urbanization, farmland system and social security system based on the empirical study, to contribute to the farmland system reform, and to find solutions to the problems of the present social security in the process of urbanization.

2. Mechanisms and means of public service provision in the transformation period

Based on the reality of multiple institutional and resource constrains of China in a transformation period, it is to further study the basic types, means and approaches of public service provision, explore the reasonable choice and innovation of specific mechanisms in providing economic and efficient public service, analyze the cooperation and division between the government and other sectors, and provide some policy suggestions on the administrative modes of public service provision and related issues.

3. Intellectual property management to strengthen the ability of indigenous innovation

Based on the innovation theories, it is to investigate China's intellectual property (IP) system, policies and management including an empirical analysis on the situation of China's IP under globalization competition, the management of IP in various forms confronted by industries, research organizations and universities in their innovation process, the evaluation of government's IP management efficiency, as well as the implementing effect of IP policy. It is argued that the inherent correlation between the IP system-policy-management and the cultivation of independent innovation ability should be examined on the ground of empirical studies so as to discover existent difficulties and advance solutions.

III. Major Research Plan

Major Research Plan is set up by NSFC to guide scientists to conduct innovative research in strategic areas associated with the national long-term scientific and technological, social and economic development. According to the principle of definite objective, stable support, integration and refinement, and leap forward development, NSFC will strengthen the top design, refine scientific objective, promote interdisciplinary studies, create the platform for multidisciplinary cooperation and exchange and stimulate new ideas, emphasize on strategic importance, and provide long-term and sustained support to research groups of projects focusing on the overall objective. Twelve Major Research Plans have been initiated since 2002. In 2006, two Major Research Plans will open to applications. The application time for other Major Research Plans will be announced in the future, respectively.

Basic research on nano science and technology

Nano science and technology are a frontier interdisciplinary area gradually developed since the late 1980s. Nano science and technology have wide ranges of application in information, materials, energy, environment, chemistry, biology, medicine, microelectronics, micro manufacture and national defense, etc., and have become an important frontier of science and technology which draw great attention from scientists of the whole world, and show great potentials of application. Nano science and technology will widely expand and deepen our understanding of the physical world, enable the production of materials and devices at atomic and molecular levels, and bring about technology revolution in such areas as information, material, energy, environment, medicine and health, biology and agriculture. Research and development of this new technology depends on the progress of theoretical and experimental studies in various disciplines, and they will in turn provide new opportunities for the development in these areas.

Scientific goals

Nano science and technology are research areas that develop rapidly in recent years. They are still in the exploration stage both theoretically and experimentally. The “Major research plan of basic research on nano science and technology” takes exploring basic theories and developing new research methods and novel experimental techniques as the starting point, advocates intercrossing multidisciplinary studies, emphasizes on basic research and plans to achieve the following goals:

1. Taking new concepts, new structures, new methods, novel technology and materials as the breakthrough point, it is to make breakthroughs in fountainhead innovation in the theory and experiments for raising the overall innovation capability in research areas of

nano science and technology, by integrating the theory and methods in modern physics, biological science, information science and chemistry.
2. For making reservations in the long-term development of science and technology in China, it is to solve nano science issues that are of great importance in the progress of science and technology of China, the development of national economy, and the construction of national defense.
3. Through the implementation of this major research plan, it is to support steadily a number of research talents stationed in China who have creative ideas and active thinking, foster and train a number of Chinese scientists in nano science and technology areas that are recognized domestically and internationally.

In order to realize the scientific goals of the research plan, the following scientific issues will be studied:

1. Nano materials design and preparation. It is to design and prepare nano materials having specific form, composition, structure and specific properties, to study the scientific problems in the preparation process of nano materials, and to explore various possibilities of application of nano materials.
2. New principles and new measures for the characterization of nano systems and micro probing. It is to develop the new concepts, new theories and new methods of characterizing nano system structures and properties, to develop new technologies and new instruments for nano system characterization, and to provide technology support to nano science and technology research.
3. Nano devices and nano electronics. It is to develop the basic theory of nano electron and devices, to construct various nano devices, explore ways of nano device assembly and joint application, and to study their properties.
4. Nano biosystem and bionic nano structure. It is to study the properties of nano biosystem and bionic nano structure, and to explore the application of nano science and technology in medical sciences (diagnosis, drug preparation and gene therapy), agricultural areas, etc.
5. New theory and new methods for nano system construction. It is to study the basic principles of formation and construction of nano system with specific structures, to construct, through system self-organization and manual control, various nano structures, and to provide the basis for constructing various functional nano system and devices.
6. Meso physical foundation of nano system and scientific basis of its special properties. It is to study the scientific basis of various special properties of nano system, and to provide the theoretical basis for research in nano science and technology.

Research contents:

1. Nano materials design and preparation

Relationship between nano materials structure and property, and its stability;
Explorations on the application of special properties of nano materials.

2. New principles and new measures of nano system characterization and micro probing

Dynamic and static characterization of nano structure;
New technology, new principles and new methods of nano structure and property measurement.

3. Nano electronics and nano devices (basic research on nano devices and integration)

Devices based on new principles breaking technical limits of silicon-based microelectronics and their scientific basis;
Nano sensing, detection, storage and display devices.

4. Nano biosystem and bionic nano structure

Biological properties of nano medical materials and bionic nano structures, and biocompatibility;
Basic problems in nano biodiagnosis technology (super high resolution imaging technology, nano biological transducers and nano biological chips).

5. Meso physical basis of nano system and scientific basis of its special properties

Low dimensional effect, surface effect, quantum zone limit effect and quantum transport;
Theoretical problems of meso physics in nano systems.

In 2006, the following areas are encouraged and preferentially supported.

Nano electronics and nano electronic devices

Structure, property design, operation mechanism, manufacture and assembly technology and main parameter and measurement characterization of nano electronics and nano electronic devices;
Structure, property and manufacture and assembly technology of nano electronic logic and computation circuits;
Principles of information processing of nano devices and circuits, including quantum computation and neuro network computation, etc.;
Nano materials for nano electronics and nano electronic devices and property optimization;
New ideas, new phenomena and new effects related to nano electronic devices and circuits.

Nanobiology

Modeling, property measurement technology and bionic applications of bio nano structures;
Model construction and performance of bio nano devices;

Nano targeted transport and slow release of drugs for curing major diseases;
Nano materials used for biomarkers and biological effects;
Technology of earlier disease diagnosis and nano characterization methods.

Informatic mechanism for underlying major life activities of eucaryote

General scientific objectives

This Major Research Plan project takes eucaryote as the research object to understand the informatic mechanism of the following three aspects: inheritance and its derivation, cell differentiation and never transduction, which include scientific issues of information constitution, vector, transduction, modification and regulation. It is designed to select the proper models of biological systems, build up technical platforms with multidisciplinary features, and fund, coordinate and integrate related researches in different disciplines. Through the implementation of the Major Research Plan, it hopes to improve the basic research capacity and quality in genetics, development, cell, biochemistry and neuroscience in China and to achieve research results with original innovation through informatic research of life process. The overall objectives of this plan are:

1. The programmed format and store of genetic information and laws of gene systemized expression existing in the whole genomic sequence of higher organism: the recognition of the coded (protein and nucleic acid) and uncoded sequence in the genome group as well as the identification and categorization of the structural characteristics; the software forecast and experimental confirmation of the genome number and the variable editing number, the biological function explanation of various kinds of DNA sequences (the integration and analysis of the genome and proteomics information, the comparative analysis of the inter-specie and inner-specie genome groups—the comparative analysis of inter-specie homological sequences, inner-specie homological sequences, the allele, the haplotype and SPNs, etc.); the organizational analysis of the genetic expression system (the interactive system between genes, genome and protein, RNAs, and genes and various regulative components), the biological explanation of the acting law and genetic expression results.
2. The clarification of informatics mechanism and process of cell, including 1) genetic information base of cell differentiation and its expression regulation: to monitor gene expression profile related to cell differentiation process, to find related genes and the expression regulation mechanisms taking the key function in controlling cell differentiation and the maintaining mechanism of differentiation state, and to identify necessary factors maintaining non-differentiation state of a totipotent or pluripotent stem cells and differentiating into a special functional cell in order to realize the controllable cell differentiation; 2) research on the channels of information transduction in cell differentiation: to identify information transduction molecules expressed specially in

each differentiation phase of a normal cell so as to discover new factors, to understand the interaction between different signal pathways in cell differentiation, to construct virtual cell models and websites to provide information service for the research of information transduction pathways, and to perform virtual experiments.

3. Informatics mechanism and molecular biology base of neural information processing Since the fund is limited, application related to neural information will not be accepted temporarily from 2005 to 2006.
4. Theoretical exploration on physical and chemical regulations and new technology application in major life communication process: the illustration of major scientific issues in major life information processes through applying physical, chemical, mathematic principles and laws which fit non-living world universally; the exploration and application of various new technologies, such as real-time monitoring and emulating techniques of cell, new types of cell dyes and markers, instant image taking, emulating and virtual imitating, etc.

Application status in 2005 and the main supporting research directions in 2006

The total funding was 3.15 million yuan in 2005 for 8 projects, with an average funding of 393,800 yuan per project. An additional 5.40 million yuan was given to 15 projects approved in 2002 that have made good progress. Another 400,000 yuan was kept for projects administration. The total budget is 8.95 million yuan.

The following areas will be supported by the plan in 2006:

1) The structural format of genetic information compiling in genome and informatics characters and functional analysis of coding elements and non-coding sequences;
2) Relevance and systematic analysis of transcription group and proteomic group information;
3) Factors concerned in the channel of molecular signal transduction and their functions using proper model animals;
4) Energy characteristics of bio-information and information transduction of eucaryote, including the changes of chemical energy and physical energy and their interrelation.

IV. Funds for Talented Professionals

The funding for talented professionals of NSFC includes the National Science Fund for Distinguished Young Scholars, National Science Fund for Distinguished Young Scholars (with foreign citizenship), Joint Research Fund for Overseas Chinese Young Scholars, Joint Research Fund for Hong Kong and Macao Young Scholars and Fund for Creative Research Groups. Please see the following for introduction.

National Science Fund for Distinguished Young Scholars

The National Science Fund for Distinguished Young Scholars aims at speeding up the growth of young scientific talents, encouraging overseas Chinese scholars to work in China and quickly fostering a group of prominent academic pacemakers in the forefront of world science and technology. The Fund specially supports excellent young Chinese scientists under the age of 45, who work domestically or abroad but plan to return soon, in the fields of basic research.

Applicants need to meet the following requirements:

1. Love the socialist motherland and have good research style and scientific ethics;
2. Younger than 45 by January 1 of the year of application;
3. Generally have Ph.D. degrees or professional titles of associate professor level (or above) or equivalent technical titles;
4. Have outstanding innovative achievements in natural science that are recognized by peers both in China and abroad, or have promoted the development of their own disciplines or relevant disciplines, have outstanding creative achievements in applied basic research areas that are recognized by peers both in China and abroad, or have major influence on the national economic and social development;
5. Have experimental facilities and human and material resources required to conduct research in China, and have sufficient time and energy to conduct the research proposed;
6. Have citizenship of China, employed by an organization in Mainland China and the employment period covers the period of proposed research, work in Mainland China for at least six months each year during the period of research. Mainland China hereinafter refers to all provinces, autonomous regions and municipalities directly governed by the State Council of China, excluding Hong Kong, Marco and Taiwan regions.

The National Science Fund for Distinguished Young Scholars plans to fund about 160 people in 2006.

National Science Fund for Distinguished Young Scholars (with foreign citizenship)

In order to take the advantage of overseas scientific and technological talents, attract young overseas Chinese professionals who have high academic level and good potential for further development to conduct basic research in China, NSFC set up the National Science Fund for Distinguished Young Scholars (with foreign citizenship) in 2005, supporting Chinese scholars under the age of 45 having foreign citizenship to conduct basic research in Mainland China on full time basis.

Applicants need to meet the following requirements:

1. Have the willingness to make contributions to the development of science and technology and the economic construction of China, and are able to work in China full time during the implementation of the project;
2. Younger than 45 by January 1 of the year of application;
3. Have been officially employed by a host research organization with the terms of employment covering the duration of the funding. Applicant should have no fixed employment outside China, which means that the host organization is the only employer of the applicant;
4. Have Ph.D. degrees and have been awarded full professorship or equivalent technical titles by the host organization;
5. Have high academic level, strong organizational capability and are able to master research directions. Have experience of doing research in universities or research institutes outside China, and have been in charge of several important research projects, have rich research experiences and research achievements recognized by domestic and international peers, and are influential in specialized disciplines;
6. Research proposed has clear directions and important scientific meanings and prospects of development, belonging to international frontier areas and needed by China, and may promote the development of relevant disciplines and the fostering of talents;
7. The host organization has good research support and the environment, and can provide sufficient experimental facilities and human and material resources required to conduct the research in China. The host organization is limited to universities and research institutes in Mainland China.

The National Science Fund for Distinguished Young Scholars (with foreign citizenship) plans to fund about 15 to 20 people in 2006.

The deadline for application is March 31, the same year as that for the General Program.

Joint Research Fund for Overseas Chinese Young Scholars

In order to attract excellent overseas Chinese young scholars to work in China, NSFC establishes the Joint Research Fund for Overseas Chinese Young Scholars to sponsor outstanding scholars under the age of 45 who are doing research abroad, can not return to China for the time being but may carry out basic research in China for a certain period of time every year.

Applicants need to meet the following requirements:

1. Love the socialist motherland and have good research style and scientific ethics;
2. Conduct research abroad, and can guarantee to work in China for more than two months every year;
3. Younger than 45 by January 1 of the year of application;
4. Have professional titles of associate professor level (or above) in that country or assistant professor title but have outstanding achievements, be in charge of a laboratory or an important project (copies of certificate of professional title and awarded document of the project should be provided);
5. Have made innovative achievements in basic research of natural sciences that are recognized by international peers, or have achieved outstanding creative scientific and technological results in applied basic research areas. The proposed research is in international research frontiers and is urgently needed in China, and applicants should have some basis of cooperation with domestic partners and the domestic partners in general should be young scholars having high research level;
6. Have domestic cooperative institutions and signed cooperative agreement. In the agreement the following should be mutually agreed upon:

1) Project title, research direction and proposed goals of research;
2) The cooperative institution should promise to provide main experimental facilities, human resources and physical materials required for research;
3) The applicants should work in the cooperative institution for more than 2 months every year.

7. The cooperative institution refers to the institution where domestic partner works, i.e., the institution that applies for this fund.

Joint Research Fund for Hong Kong and Macao Young Scholars

In order to encourage excellent young scholars in Hong Kong and Macao to work in the mainland, NSFC establishes the Joint Research Fund for Hong Kong and Macao Young Scholars to sponsor those excellent young scholars under the age of 45 who are doing

research in Hong Kong or Macao, can not return to China for the time being but may carry out basic research and applied basic research in the mainland for a certain period of time every year.

Applicants need to meet the following requirements:

1. Love the socialist motherland and have good research style and scientific ethics;
2. Conduct research in Hong Kong or Marco, and can guarantee to work in the mainland for more than two months every year;
3. Younger than 45 by January 1 of the year of application;
4. Have professional titles of associate professor level (or above) in that region or assistant professor title but have outstanding achievements, be in charge of a laboratory or an important project (copies of certificate of professional title and awarded document of the project should be provided) in Hong Kong or Marco;
5. Have made innovative achievements in basic research of natural sciences that are recognized by international peers, or have achieved outstanding creative scientific and technological results in applied basic research areas. The proposed research is in international research frontiers and is urgently needed in China, and applicants should have some basis of cooperation with domestic partners and the domestic partners in general should be young scholars having high research level;
6. Have domestic cooperative institutions and signed cooperative agreement. In the agreement the following should be mutually agreed upon:

a) Project title, research direction and proposed goals of research;
b) The cooperative institution should promise to provide main experimental facilities and human resources and physical materials required for the research;
c) The applicant should work in the cooperative institution for more than 2 months every year.

7. The cooperative institution refers to the institution where domestic partner works, i.e., the institution that applies for this fund.

The deadline for application is March 31, the same year as that for General Program.

The Joint Research Fund for Hong Kong and Macao Young Scholars plans to fund 80 people in 2006.

Science Fund for Creative Research Groups

In order to provide steady support to frontier research topics in basic science and to foster and bring up researchers and research groups with innovative ability, NSFC launched a pilot program “Science Fund for Creative Research Groups” in 2000. It funds research groups which carry out basic research or applied basic research in China focusing on key research orientations and which have prominent young scientists as pacemakers or backbones.

Candidates are recommended by the Chinese Academy of Sciences, Ministry of Education, China Association for Science and Technology and NSFC scientific departments. Free applications will not be accepted.

The Science Fund for Creative Research Groups plans to fund about 20 groups in 2006.

V. International (Regional) Cooperation and Exchange

In 2006, focusing on its core tasks and following its working principles for the new period, NSFC will carry out active and productive international cooperation and exchange programs, with the aim of promoting fountainhead innovation and with the targets of fostering talented personnel and obtaining research achievements. The following tasks will be strengthened in 2006:

1) Playing the guiding role in the organization and implementation of international cooperation programs through measures such as policy study, expert consultation, guide promulgation, and so on;
2) Improving the environment and conditions for international (regional) cooperation in basic research by expanding cooperation channels, increasing investment and regulating the processes of evaluation, approval and management; increasing the funding properly to international (regional) joint research projects such as major international joint research projects and joint research projects within the framework of agreements with foreign funding organizations;
3) Planning and organizing substantial joint research projects of high academic standard in more research areas;
4) Paying more attention to the cultivation of major joint research projects within the framework of agreements with foreign funding organizations by bringing into full play the bilateral or multilateral cooperation channels;
5) Putting emphasis on attracting more and more excellent overseas scientists into Chinese research team, and supporting Chinese institutions to attract excellent foreign scientists to work in China for a relatively long period of time;
6) Promoting the international evaluation for NSFC projects to bring up the standards of research work and perfect the science funding system.

Please refer to NSFC website and the *Guide to Programs* for detailed information concerning the requirements to applicants and management regulations of various programs, the main mission of the Bureau of International Cooperation (BIC), its organizational structure and related responsibilities, general information on the agreements signed between NSFC and its partners abroad, and the list of agreements.

Funding for the program of “international conferences to be held aboard” was canceled in May 11, 2005, and no application is accepted thereafter.

Part A. Project Categories and Special Funds

Major International (Regional) Joint Research Program

In order to conform to the globalization of scientific research, make good use of international scientific resources and increase China's international competitiveness in basic research, NSFC set up the Major International (Regional) Joint Research Program in 2001 to push ahead some basic research fields in China into the world rank. Following the policy of "doing things in a selective way" and in conformity with the principle of setting limited goals, emphasizing on key points and stressing interdisciplinary study, the Program sets its strategic targets towards promoting our independent ability for innovation based on equality, mutual benefits and sharing of results.

The Program mainly funds:
1) Research in the priority funding areas of NSFC;
2) Joint research in urgently needed and exigent development areas;
3) Large international projects and programs with Chinese participation;
4) Major research projects by utilizing large-scale scientific facilities abroad;
5) Large bilateral or multilateral projects jointly recommended by NSFC and its counterparts abroad.

Starting from 2006, NSFC will introduce a pool of acceptance and evaluation for the Program. Applicant should submit applications according to the time announced in the call for proposals. For research projects jointly organized with partner funding organizations abroad, the time of call for proposals will be decided by agreement and announced on the NSFC website. Applicant may also refer to the *Guide to Programs*.

Joint Research Project

The Joint Research Project is a key category of international cooperation program granted by NSFC. Scientists funded by NSFC are encouraged to carry out joint research projects with foreign scientists on subjects of common interests through information and data exchange, personnel exchange as well as scientific experiments in the principle of equality, mutual interest and results sharing. According to international practice, this fund covers international travel expenses for Chinese scientists, and accommodation and domestic travel expenses for foreign scientists in China.

Applicants for this fund should be key investigators undertaking ongoing NSFC projects. The joint research should benefit the exchange of academic ideas, and the acceleration and improvement of ongoing NSFC projects through making full use of the partner's research facilities, raising the research standards and training young researchers. The joint research based on NSFC funded projects should contain no classified contents.

International Conferences Held in China

International Conferences Held in China may help more Chinese scientists to follow the development trends of related research areas and establish wide contacts with peers abroad, so as to promote the cooperation between them. Meanwhile, it may also display the new development and progress of Chinese science to the world and expand the influence of Chinese basic research in the international scientific community.

Attention should be paid to promote the quality of the conferences and attract more high-level international conferences to be held in China. The priority will be given to series academic meetings of important international organizations and seminars aimed at young scientists and students, important global or regional international conferences, conferences closely related to the priority areas supported by NSFC and to the newly emerging disciplines, conferences with world eminent scientists as invited speakers, and bilateral and multilateral seminars of small scale and high level that discuss in depth the research priority and hotspots.

Special Fund for Chinese Scholars Abroad Returning for Short-period of Work or Lecture (including the "two bases" projects)

Chinese scholars abroad make up an important part of our precious human resources. In August 1992, NSFC established the Special Fund for Chinese Scholars Abroad Returning for Short-period of Work or Lecture in China and it has achieved prominent results ever since. Some of these scholars have set up stable workplaces in China, and realized the research model of "two bases". Some of them find their suitable positions in China through short-period work, attaining "soft landing" from overseas to China.

In 2006, NSFC will keep improving and developing the "two-bases" model and raise the funding level. It will elaborate in organizing and directing more and more scholars to combine closely their work abroad with their work in China, with key research projects, with the fostering of young scholars, and with base building in China. Application information for the "two-bases" projects is available in the "Complementary Regulations on the Implementation of NSFC Fund for Chinese Scholars Abroad Returning for Short-period of Work or Lecture in China".

NSFC will continue to support Chinese scholars abroad to work or lecture in China in various effective ways. Meanwhile, in order to adapt to the developing situation, NSFC will actively explore new ways for these scholars to work for China. It will continue to invite some Chinese scholars abroad to participate in the panel review of research proposals, so as to listen directly to their opinions, select projects with creative ideas and raise the assessment quality. At the same time, NSFC will organize or co-organize with related ministries or academic organizations academic activities for these scholars to take part in.

Special Cooperation Fund for State Key Laboratories

As the State key laboratories continuously expand their research scopes, the Special Cooperation Fund for State Key Laboratories (Special Fund for short) has been increased steadily.

A one-time fund of no more than 200 thousand yuan may be allocated to those State Key laboratories evaluated and rated "A" in the current year. The awardees are required to submit their annual plans for international cooperation and exchange to the Bureau of International Cooperation. In 2006, the Special Fund supports scientists from these labs to participate in the following international cooperation activities: 1) to conduct joint research projects; 2) to organize academic conferences in China. The State Key Laboratories are encouraged to host or organize various kinds of international academic conferences so as to strengthen the international cooperation and exchange, expand the influence of Chinese scientists, and elevate the status of our basic research in the international science community; 3) to host qualified foreign scientists to undertake longer term research in these laboratories.

Part B. Guide to International (Regional) Cooperation and Exchange with Different Countries and Regions

Asia, Africa and International Organizations

NSFC has signed bilateral agreements or memoranda of understanding on S&T cooperation with nine scientific funding organizations in Asia and Africa and with six international research organizations in the world. In December 2004, "A3 Foresight Program" was set up jointly by NSFC, Japan Society for the Promotion of Sciences (JSPS) and Korea Science and Engineering Foundation in the second meeting of the Heads of Research Councils in Asia (A-HORCs) held in Shanghai. Nano science and technology was decided to be the joint research area for 2005. Two projects have been approved after joint evaluation.

A3 Foresight Program jointly supports the cooperation of scientists from China, Japan and Korea to conduct world level research in selected strategic areas. The purpose of this program is to enable Asia become one of the core research centers in the world in selected areas. Through the implementation of this program, the goal of fostering excellent young researches and making contributions to the solution of common regional issues should be reached. The joint research area of current year is the same as the topic of the Northeastern Asian Symposium organized jointly by NSFC, JSPS and KOSEF in the previous year. The joint research area of A3 Foresight Program is biotechnology for 2006. The projects of A3 Foresight Program will be conducted as a Major International Joint Research Project. NSFC, JSPS and KOSEF will respectively make call for proposals on their websites on December

1. Two 3-year projects will be selected for support at two million yuan each from NSFC.

Since 2004, NSFC and Japan Science and Technology Agency (JST) have developed cooperation on the theme of "S&T for Environmental Conservation and Construction of a Society with Less Environmental Burden". Each year, both organizations will decide the joint research areas through discussion, and a workshop with the topics selected from the decided joint research areas will be organized in China and Japan alternatively. The joint research areas for 2005 were: 1) effects of living environment on human health and 2) new energy (biomass, photocatalysis and hydrogen energy). Both sides will announce the cooperation research areas and call for proposals on the websites in February. A maximum of five 3-year projects will be selected for support with the funding of up to one million yuan per project from NSFC.

The memorandum of understanding on scientific exchange between NSFC and JSPS stipulates that the two sides jointly support five 3-year joint research projects and four bilateral workshops per year organized by Chinese and Japanese scientists, of which two are held in China and two in Japan. Both organizations will issue call for proposals on their websites in July every year. The application deadline is the Friday of the first complete week in September.

NSFC and KOSEF jointly support bilateral activities including joint research projects and academic seminars. The duration of each joint research projects is two years. On each side, the participants of a bilateral seminar must come from at least three institutions. Both organizations will issue call for proposals on their websites in July and the deadline is December 15 every year. The Sino-Korean Joint Committee on Basic Science makes decisions on the support of bilateral activities. In 2005, the Joint Committee approved a total of 43 bilateral activities, including 27 joint research projects, 12 bilateral seminars and four fact-finding delegations. It is expected that bilateral activities for 2006 will remain the same as in 2005.

NSFC has signed scientific agreements with the Academy of Scientific Research and Technology of the Arab Republic of Egypt, Pakistan Science Foundation, the National Research Council of Thailand, the Council for Science and Industrial Research of India and the Department of Science and Technology of India, and jointly fund research projects and bilateral workshops co-organized by both sides.

NSFC has also signed scientific agreements with six international research organizations as follows: the Center of European Nuclear Research (CERN), International Center for Theoretical Physics (ICTP), International Institute of Applied Systems Analysis (IIASA), International Rice Research Institute (IRRI), International Maize and Wheat Improvement Center (IMWIC) and International Institute for Software Technology of the United Nations University (IIST). Jointly with the Ministry of Science and Technology and the Chinese Academy of Sciences, NSFC supports Chinese scientists participating in LHC experiment, a major international program at CERN. Every year, NSFC sponsors about 50 Chinese young scholars in the areas of mathematics, physics and atmospheric physics to participate

in many research activities at ICTP, such as summer seminars, short-term joint research or post-doctoral study. The Steering Committee of the Tianyuan Fund for Mathematics, the Steering Committee of the Special Fund for Theoretical Physics and Expert Panels for relevant research areas in earth sciences are responsible for recommending qualified scholars to ICTP. As one of the 16 National Member organizations of IIASA, NSFC attends IIASA council meetings to decide research areas, approve the research plans, appoints IIASA director, and so on. NSFC encourages Chinese scientists to conduct multilateral cooperation with various IIASA project groups in the areas of energy, environment, land use, population and so on, to jointly apply research funding from various governmental organizations, private and national foundations, World Bank, EU Framework Program, etc. NSFC supports fully or partially to several Chinese young scholars to participate in the annual 3-month "Young Scientists Summer Program" from May to August at IIASA. In 2005, six young scholars received support from NSFC. For detailed information, please refer to IIASA website at http://www.iiasa.ac. NSFC mutually supports joint research projects in specific areas with IIASA, IRRI, IMWIC and IIST.

NSFC encourages excellent young researchers having NSFC's grants to take positions in important international academic organizations. Their academic activities in those organizations will be preferentially supported in the selection.

America, Oceania and Eastern Europe

NSFC has signed scientific cooperative agreements or MOU with counterpart science funding organizations and research institutions of 12 countries in America, Oceania and Eastern Europe.

NSFC encourages collaboration between China and the US with emphasis on mutual benefit, talents and merits. In 2006, priority will be further given to Sino-US cooperation in areas of information science, network technology, engineering and material sciences, mathematical and physical sciences, environmental friendly chemistry, biodiversity, science policy, etc. NSFC and NSF will continue to support bilateral academic workshops and substantial cooperation in the fields of common interests.

NSFC and Russia Foundation for Basic Research (RFBR) will jointly support collaborative research projects (with a two-year implementation period) in mathematical and physical sciences, chemical science, life science, earth science, materials and engineering sciences, information science and management science. The NSFC/RFBR joint research projects approved in 2005 will get funding and be carried out in 2006. The call for proposals for 2006 will be announced simultaneously at the websites of NSFC and RFBR. Scientists of the two countries shall submit proposals respectively to NSFC and RFBR according to the relative regulations and requirements based on the communication and cooperative plans.

In 2006, NSFC and Fonds de la Recherche en Sante du Quebec (FRSQ) will jointly organize

and support bilateral academic workshops and research programs. Scientists of the two countries shall submit proposals respectively to NSFC and FRSQ according to their respective requirements.

In 2006, NSFC and Canadian Institutes of Health Research (CIHR) will jointly support health research programs in the following six priority areas: neurosciences, diabetes and obesity, cardiovascular system, genetics, infection and immunity, child and youth health. The implementation period for each project will usually be 3 years and call for proposals will be announced simultaneously each year at the websites of NSFC and CIHR.

In 2006, NSFC will give further attention to cooperation and exchanges with Australia on energy, environment and health research. Under the cooperation framework between NSFC and Australia Research Council (ARC), sustained support to research of common interests will be provided in 2006. The China/Australia Special Fund co-sponsored by NSFC and the Department of Education, Science and Training of Australia (DEST) will launch the new round of call for proposals for 2006, which will be announced simultaneously at the websites of NSFC and DEST at the beginning of 2006.

In 2006, support will be further provided to joint research and bilateral academic workshops between China and other countries in America, Oceania and Eastern Europe. Priority will be continuously given to joint research programs of large scale and with major scientific importance.

West Europe

NSFC has signed agreements and memoranda of understanding on scientific cooperation with 26 science foundations or research councils in 15 countries in North, South and West Europe, supporting mainly the following activities among scientists from China and other countries: short-term exchange visits, bilateral academic workshops and joint research.

On the basis of “equality and mutual benefits, supplement of each other’s strong points, union of competitive contenders, joint investment and sharing of risk and results”, NSFC gives special emphasis on the cooperation in information science, life science, nano-technology, agriculture, materials science, human health and environment. It will provide priorities to bilateral workshops and joint research projects with substantial contents, especially those under the memoranda of understanding between NSFC and its partners, to excellent middle-aged and young researchers and research teams undertaking NSFC projects, and to those Chinese scientists returned from abroad who already have some collaboration basis. Chinese researchers, research teams and institutions are encouraged to establish a long-term and steady relationship with their European counterparts for substantial cooperation and exchange of scientific significance.

In 2005, NSFC signed the memoranda of understanding on cooperation successively with the Science Foundation Ireland (SFI), the UK Natural Environment Research Council

(NERC) and the UK Medical Research Council (MRC). The main scientific fields of NSFC-SFI cooperation are biotechnology, information technology and computer science, and new materials; those of NSFC-NERC cooperation are climate change, ecosystem services and biodiversity, and sustainable development; and those of NSFC-MRC cooperation are infection, bioinformatics, stem cell, life sciences applicable to health, science of aging and neuroscience/brain science. Under these memoranda, both sides will provide joint support to bilateral workshops, individual outgoing and incoming visits by leading scientists and joint research in areas or subjects identified as priority by both sides.

UK: NSFC and the Royal Society of UK (RS) support joint projects with the duration of 2 years between Chinese and British scientists, who will submit their proposals respectively to NSFC and RS before the deadline of September 15. The approved joint projects, announced by the end of the year, will start from April 1, 2006. NSFC and RS will co-sponsor no more than 10 projects in 2006. Please refer to NSFC website for detailed information.

In 2006, NSFC will continue to cooperate with UK research councils such as EPSRC, BBSRC, PPARC, NERC and MRC to fund small-sized bilateral workshops jointly organized by Chinese and British scientists. Chief organizers from both sides should submit applications to their own funding organizations respectively. And the substantial joint research projects between researchers from both countries will be encouraged.

Germany: According to the agreement on cooperation between NSFC and DFG of Germany, both sides will support short-term research visits (usually not exceeding three months), bilateral workshops and joint research projects. The Chinese and German scientists submit their applications to their own funding organizations (NSFC or DFG). In 2006, NSFC and DFG will encourage scientists to apply for substantial joint research projects. Applicants should jointly make the research plan and then submit their applications to their own funding organizations. NSFC and DFG will organize evaluation and then together make the funding decision.

In 2005, NSFC and DFG signed the agreement on Sino-German Joint Interdisciplinary Research Program (SG-JIRP) to jointly fund the long-term cooperation at an internationally competitive level between researchers from both countries, promote the interdisciplinary cooperation, and advance young researchers. The SG-JIRP will be a platform for scientists from both countries to conduct interdisciplinary joint research.

Groups of researchers from a limited number of Chinese and German research institutions can combine their expertise, agree on a common research topic, identify common research goals and submit joint proposals to NSFC and DFG within the spheres of competence of the organizations, which will jointly make the funding decision upon the international review of the proposals.

Finland: According to the agreement of scientific cooperation between NSFC and the

Academy of Finland, both sides will support short-term study visits (usually not exceeding three months), bilateral workshops and joint research projects between scientists from both countries. Please refer to the International Cooperation on NSFC website for detailed information.

Italy: According to the agreement on cooperation between NSFC and the Italian Institute of Advanced Mathematics, both sides will jointly sponsor a workshop and support 3 to 5 excellent Chinese young scientists for academic visits of no more than 3 months to Italy.

Cooperation and Exchange with Hong Kong and Macao SARs and Taiwan Region of China

Adhering to the principles of "one country, two systems" and the Basic Law of the Special Administrative Region of Hong Kong of the People's Republic of China, NSFC will continue its active support to various forms of cooperation and exchange between scientists inland and Hong Kong in areas of mutual interests. In such cooperation, the principles of learning from each other's advantages, mutual promotion, sharing of research results and making joint efforts to raise each other's scientific standards should be carried through, priorities of cooperation be stressed and flexible ways and means of cooperation and exchange be adopted. For instance, joint research, jointly holding international and domestic scientific conferences and exchange of scientists may be chosen as approaches to the cooperation of both sides.

On November 23, 1998, NSFC and the Research Grant Council of Hong Kong reached the agreement on establishing a joint research fund. According to the agreement, the joint research fund is five million yuan and 10 million Hong Kong dollars in 2006. Encouraged funding areas include information science, biological science, new materials, ocean and environmental science, Chinese traditional medicine and management science. For detailed information, please refer to the announcement of application for 2006. NSFC will make another special announcement in the 4th quarter of 2005 along with other categories of funding.

NSFC will continue to support various activities of scientific cooperation and exchange with substantial contents, among scientists from both the inland and Macao. Emphasis will be put on research projects related to environmental protection and urban development.

NSFC has spared no efforts to encourage and promote scientific cooperation and exchange between scientists on both sides of the Taiwan Straits. In 2006, NSFC will keep doing its utmost to promote and fund cooperation and exchange activities, especially joint research projects with substantial contents in some mutually interested areas between scientists from both the mainland and Taiwan region on the basis of learning from each other's advantages, sharing research results, mutual promotion and raising each other's scientific standards.

Sino-German Center for Research Promotion

The Sino-German Center for Research Promotion jointly founded by NSFC and DFG of Germany, opened to public in October 2000. It is mainly for the promotion of scientific cooperation and exchange among institutions of higher learning in China and Germany in the fields of basic research and applied basic research.

The Center accepts cooperation proposals submitted jointly by Chinese and German scientists at any time of the year and support the types of activities including bilateral academic seminars, joint research groups, publications and pre-preparation for cooperative projects.

According to the suggestions of the Joint Committee of the Center, the Center will select joint projects in the following strategic areas: new materials; nano-tech and micro system technology, information technology and communication technology (including optoelectronics system), food nutrition, energy research, arid and environment research, life science, advanced manufacture technology, transportation research, etc. In order to establish a platform for participants of projects from the two countries, the Center will commission the projects coordinators of both sides to hold a meeting in 2006. The Center will make call for proposals and select the best ones for support in the areas of water resources, stem cell, intelligent transportation technology, green chemistry, and information and communication technology.

The Center also pays a great attention to the exchange and cooperation between young scientists of two countries and adopts a flexible mechanism to support mainly such activities as short-term seminars, young scientists' forum, and selecting excellent doctoral students to attend the annual conference of Nobel Laureates held in Lindau, Germany. In 2006, twenty-five excellent doctoral students will be selected from Chinese universities and research institutions to attend the Conference.

Up to now, the Center has received about 350 applications, with 200 approved. Specific requirements and relevant information are available on the website of the Center: http://www.sinogermanscience.org.cn

VI.Programs of Joint Funds

The joint funds are set up by NSFC and other government departments or industrial sectors to promote the integration of knowledge creation and technological innovation. They are aimed at speeding up the industrialization of basic research results, solving key scientific problems for industrial sectors and providing technological reserves that are needed by industries. They are divided into two categories: jointly funded projects and joint funds. The former funds individual projects and the latter supports several projects by jointly setting aside a certain amount of money each year. The jointly funded projects can also be categorized into General Program projects and Key Program projects. All jointly funded projects will be counted in the limitation search for the number of projects in corresponding categories. Please pay attention to this. Currently the joint funds open for application in 2006 include NSAF Joint Fund, Joint Fund for Iron and Steel Research, Joint Fund for Civil Aviation Research, and the jointly funded projects include those with less developed regions and those with Microsoft Research Institute Asia. They are described below.

Joint Funds

NSAF Joint Fund

Jointly set up by NSFC and the Chinese Academy of Engineering Physics (CAEP), the Fund is to encourage scientists in related fields to carry out basic and applied basic researches relevant to the national security by applying the management policy and evaluation system of NSFC, so as to explore new research directions, to discover new phenomena and laws, to upgrade innovative ability of science and technology in the national defense, and to foster young professionals in this area. NSFC and CAEP issue the *Guide to Programs* according to the research needs of national security.

In 2005, NSAF Joint Fund received 86 applications in total. Through peer review and panel meetings, 41 projects were funded. The total funding was 13.40 million yuan, with an average funding of 327 thousand yuan per project.

The *Guide to Programs* for 2006 consists of three parts, namely, “key projects”, “key funding projects” and “subjects with defined goals”. They are open to scientists in universities and research institutes all over China. “Key projects” will fund 2 projects, with an average funding of 1 million yuan per project; “key funding projects” will fund 5 projects, with an average funding of 400 to 500 thousand yuan per project, and the “subjects with defined goals” will fund 41 projects, applications must be within the subjects listed in the Guide to Programs for 2006, with an average funding of approximately 200 to 300 thousand yuan per project. For detailed information, please refer to NSFC website (www.

nsfc.gov.cn) or contact the administration office of the NSAF Joint Fund.

The application, evaluation and management of NSAF Joint Fund are conducted in accordance with the management policy of NSFC projects and the Proposed Regulations for NSAF Joint Fund Management. Attention should be paid to the following points in submitting applications:

1. The Department of Mathematical and Physical Sciences of NSFC is responsible for organizing the evaluation for proposals of NSAF projects;
2. The standard form of application for NSFC projects should be used, and proper information should be given according to the requirement;
3. The types of projects to be applied must be specified;
4. Encouragement is given to proposals to be jointly carried out by 2 to 3 institutes for "key projects";
5. "Key funding projects" and "subjects with defined goals" are all treated as General Program projects in terms of management;
6. The limitation on the number of projects undertaken by one investigator will be checked in 2006;
7. Investigators in CAEP are not allowed to apply, either as principal investigators or as participants in "subjects with defined goals". But they can apply projects in "key projects" or "key funding projects".
8. Once the panel meeting approves the project, the applicant's home institution will receive a notice to sign the NSAF Joint Fund contract. The applicants, after getting the notice, should contact the administrative office of the Joint Fund in CAEP and sign contract in due time. Only projects with signed contracts are processed for final approval.
9. Young scientists from CAEP will be provided with opportunities to participate in projects funded by the "NSAF Joint Fund" and specific requirements may be laid out in the NSAF Joint Fund contract.

These young researchers will participate in the research work under the guidance of their principal investigators. Their research costs and living expenses during their stay (at least 3 months every year) in the PI's home institute and the relevant round-trip travel expenses each year should be paid through the Joint Fund. However, they are not allowed to study for academic degrees with the Fund. The quota of young researchers for each project can be found in the Guide.

10. Research results of the projects, including papers and monographs published, patents and awards obtained, etc., must be marked "supported by the Joint Fund of NSFC-CAEP", and the PIs must submit the final documents to CAEP according to the format given in the Guide (For details pleased see the agreement.). PI's home institutions and CAEP share the results.
11. NSFC and CAEP will organize various forms of follow-up exams and evaluation for the completed projects according to the annual progress and final documents provided, and award honorary certificates to excellent projects.

12. When applying for projects, applicants may contact CAEP through the Office of Joint Fund to get better understanding of the background and requirements of relevant subjects.

Contact information:

Office of the Joint Fund, CAEP
Address: PO Box 919, Mianyang
Sichuan Province
Post code: 621900
Contact persons: Zhuo Zhiyun and Cao Ying
Tel: 0816-2484487

Department of Mathematical and Physical Sciences, NSFC
Address: 83, Shuangqing Road, Haidian District, Beijing
Post code: 100085
Contact persons: Liu Xizhen and Pu Men
Tel: 010-62326910

List of Key Projects in 2006

Sequential number	Project title
F1	Theoretical and experimental studies on the formation process of aerosol cloud cluster
F2	Studies on the physics and technology of high power tera hertz radiation source

List of Key Funding Projects in 2006

Sequential number	Project title
ZD1	Studies on the stability of interface motion and turbulent mixing
ZD2	Studies on the force field methods of multi scale simulation technology for high energy materials
ZD3	Computational methods for 3-D internal combustion fluid dynamics
ZD4	Measurement and characteristics of land echo of 8 mm, S, L band radar
ZD5	Mechanism and methods of the chemical mechanical abrasive wear of W-Mo/Mg-Al alloys

List of "Subjects with Defined Goals" in 2005

Sequential number	Project title
1	Mechanism of electric breakdown for PZT-95/5 ferro electric ceramics under shockwave compression
2	Sealing mechanism of detonation of metal explosives by laser heat
3	Experimental studies and cross check on the equation of state of various pressurized standard materials at high temperature and high pressure
4	Initial reaction dynamic process of RDX and HMX explosives at high temperature and high pressure
5	Analysis of recovered samples of ferro based materials under shock loading and relevant methods for the diagnosis of material properties during dynamic loading process
6	Strong electron beam accelerator electro magnetic compatibility technology
7	Thompson scattering technology for the diagnosis of state parameters of Z-pinch plasma
8	Lattice distribution and stability of minerals containing nuclear species
9	Micro-reaction mechanism of radiolysis and photolysis of aromatic nitro organic materials
10	Exchange mechanism of hydrogen isotope on polymer material SDB
11	New technology and mechanism of in situ strengthening of silicon rubber
12	Structure and properties of new compounds and functional supplements for PBX explosives
13	Studies on methods of analyzing thermodynamic environment in flights across the atm osphere
14	Numerical modeling technology in dynamic analysis of composite materials and porous materials
15	Studies on optimal design methods for nonlinear coupling behavior of bolt and flange connector structures
16	Integrated dynamic optimization methods for structure layout
17	Studies on the exciting mechanism of multiplayer piezoelectric ceramics
18	Studies on self adaptive filter for the identification of relevant electronics signals
19	Research on key technologies in highly dynamic GPS receivers
20	Studies on the approximate blind detection and estimation methods of spread spectrum signals
21	Super precision milling and cutting mechanism and optimal control technology based on online electrolytic trimming
22	Physical properties of uranium and plutonium ions in water solution
23	Technology of compound formation for Mo based ultra-thin metals

(*Continue*)

Sequential number	Project title
24	Magnetic controlled sputtering preparation technology of new electron defect oxide membrane
25	Auto collimation technology based on machine vision
26	Exploratory studies on low flux spatial filtering of non focused high power lasers
27	Thermo effects of high power nonlinear optical media
28	N-heterogeneous ring Karbin metal fitting piece and co polymerization with styrene monomer
29	Increase of ultra short pulse signal noise ratio by plasma mirror
30	Theoretical studies on high temperature dense plasma spectrum patterns
31	Study on the first property principle of electro excitation behavior on high pressure compact solid
32	Experimental and theoretical studies of temporal and spatial evolution of super cold strong coupled plasmas
33	Key technology of high power microwave self-adaptive power synthesis
34	Studies on the computation of absorption factor a(t) by Monte Carlo method and the development of relevant programs
35	Preliminary processing methods for sparse algebraic equations in large scale scientific computations
36	Properness and qualitative analysis of radiation fluid mechanism
37	Studies on multi-scale, trans-regional methods for material damage failure
38	Numerical simulation of Euler's equation of high temperature high density multi-media large deformation flows
39	Studies on increasing the threshold of surface breakdown by photo catalyst
40	Studies on the technology for high power, narrow pulse, fast millimeter wave detection
41	Studies on the methods of X-ray splitting

Joint Fund of Iron and Steel Research

The Joint Fund of Iron and Steel Research was set up by NSFC and Baoshan Steel Complex in August 2000 which mainly supports basic research, applied research and development projects of scientific significance and application potentials, such as new metallurgical technologies as well as related techniques, materials, energy, environment, equipment, information and so on.

The Fund, jointly managed by NSFC and Baoshan Steel Complex, is open to scientists all over China, and proposals are accepted and processed by NSFC Department of Engineering and Materials Sciences. The procedures of application and evaluation are the same as that of NSFC General and Key Program projects. The total funding in 2006 will be 6 million yuan.

The Fund advocates disciplinary intercrossing and joint efforts of industry, research institutions and universities, provides preferential support to middle-aged and young scientists, and encourages further support of various forms by the departments to which the research subjects are related.

For detailed information, please contact Dr. Zhu Wangxi in the Division I of Engineering Science, Tel: 010-62327136, E-mail: e4m@nsfc.gov.cn.

Research areas to be funded in 2006:

* Basis for coordinated and sustainable development between energy, cost saving, ecological environment and iron and steel industry;
* New principles, methodologies and theories in metallurgical and materials physical-chemistry, metallurgical reaction engineering and system engineering;
* Basic processes of metallurgy and fabrication of iron and steel under extreme conditions and different outfields;
* Basic research on computations in materials science and its application in iron and steel industry;
* Studies on the laws and theories of procedure control in steel casting and rolling process;
* New laws, new methods and new theory of casting rolling, for steel, special alloy and high alloy steel;
* New laws, new methods and new theories of surface treatment of iron and steel materials;
* New principles of product quality management control and performance forecast;
* New principles of equipment diagnosis and evaluation in iron and steel industry;
* New theory, new methods and control strategy of information technology in iron and steel industry;
* Basic technologies for new process and new equipment in iron and steel industry;
* Research, development and application of novel iron and steel materials, special alloys and high alloy steels;

* Related studies on improving the economic competitiveness of iron and steel industry.

The following areas for key projects are accepted in 2006:

1. Theory of evolution of organizations and control of special alloy and high temperature alloy in hot tandem rolling process

It is to explore the deformation behavior of hard-to-deform metals in hot tandem rolling such as special alloy (high temperature alloy, erosion resistant alloy, and titanium and titanium alloy), high content alloy (W-Mo-Cr-V series ledeburite high speed steel, Cr-Mn-Ni-N series austenite valve steel) in production of special steel. Based on the physical metallurgical models and by the simulation method, it is to study the organization evolution in hot tandem rolling process involving fast deformation and temperature rise of special alloy and high content alloy, and to control online the best organization structure of hard-to-deform steels so as to ensure its property and surface free of defects.

2. Integrated treatment of waste in steel plant containing chromium and nickel

It is to study the novel technology, new equipment and new facilities of treating, recycling and integrated reuse of wastes generated in stainless steel smelting process, and new methods and theory of controlling chromium and nickel content in the waste.

Joint Fund of Civil Aviation Research

The Joint Fund of Civil Aviation Research is set up jointly by NSFC and the Civil Aviation Administration of China (CAAC). The aim of this joint fund is to attract researchers from the universities and research institutions all over China to participate in basic and applied basic research in the development of aviation science and technology, to increase the ability of original innovation, to promote the integration of knowledge and technology innovation in aviation industry, and to make contributions to promoting China to become a nation with strong aviation industry in the world.

As a component of the National Natural Science Fund, the funding intensity of the projects for the Joint Funds is similar to that of NSFC General Program projects. Both parties administer the projects. The application handling, review and management will follow the regulations for NSFC's General Program projects. We encourage international cooperation and exchanges and joint research in and outside the aviation industry. The followings should be noted when applying:

1. We encourage basic research with characteristics of forward-looking, innovation and significance for the development of aviation science and technology that are within the areas specified in the Guide;
2. Formality check (including the limitation of projects undertaking by one investigator)

will be done according to the regulations of General Program concerned.
3. Please use the standard form of application for NSFC projects.

The total budget of the Joint fund is 4 million yuan each year. In 2005, 23 projects were funded (including 3 projects of Small Fund for Exploratory Studies). Applications in the past 2 years show that, through the Joint Fund, attracting scientists in domestic universities and research institutes to participate in basic research having civil aviation background is an effective way to increase the fountainhead innovation capability and fostering talents in civil aviation science and technology. But it should be emphasized that applications should pay attention to key scientific and technical problems and stress on innovation.

In 2006, basic and applied basic research in the following areas will be funded:

1. New materials for airport road and geotechnical engineering theory; new materials and new technologies for aircraft;
2. New theory of aviation system and technology, emulation technology for aviation systems and flight performance theory and technology;
3. Basic theories and technology of aviation safety, intelligent traffic control and information safety, new theory and methods for security check, emergency management and decision making system;
4. Diagnosis of aviation systems and facilities, theory and methods of system reliability and system security;
5. Theory and management of national air resources management, aviation safety management and crime prevention control theory.

In 2006, applications to the Joint Fund of Civil Aviation Research will be handled according to the announcement related to the application of NSFC's projects in 2006. Review procedures will be handled by the Department of Information Sciences.

Contact:
Department of Information Sciences, NSFC
Address: 83, Shuangqing Road
Haidian District, Beijing
Post code: 100085
Contact persons: Zhang Zhaotian, Xiong Xiaoyun and Xu Jianhua
Tel: 010-62327147

Department of Personnel Management, Science and Education
Civil Aviation Administration of China
Address: No. 155, Dongsixidajie
Dongcheng District, Beijing
Post code 100710
Contact persons: Zhang Xiwu and Xu Hong
Tel: 010-64092631

Jointly Funded Projects

Jointly Funded Project for Less Developed Regions

Applicants should mark the selected topics in the "additional note section" when applying for the Jointly Funded Project for Less Developed Regions.

1. Molecular mechanisms of the differentiation and formation of cashmere of goat

Cashmere goat is one of the chief livestock in Inner Mongolia. The quality of cashmere products is excellent and is famous both at home and abroad. The hair is mainly consisted of keratin and keratin-related proteins, the quality of cashmere is closely related to the slenderness and structure; but the cashmere structure protein is not well known by far. This project will chiefly give support to the system study of cashmere keratin, and the gene structure, expression character and the regulating mechanisms of keratin related proteins, including the series and structure of keratin and keratin related proteins, the expression model and up regulating molecules of genes of keratin and keratin related proteins, and the corresponding expression between genes of keratin and keratin related proteins. This project is to provide a solid theoretical basis for improving the cashmere quality.

Qualification of applicants: Researchers from the universities and research institutions under the jurisdiction of Inner Mongolia Autonomous Region.

The Department of Life Sciences is responsible for handling applications.

2. Mechanisms of the invasion of exotic species to Xinjiang oasis agriculture and the anti-risk research

Xinjiang is a typical oasis agricultural district, and is a relatively close and fragile eco-region. The local agricultural economy and ecosystem may be severely damaged by the residence of invasive exotic species. For example, in recent years, Bemisia babaci has successively invaded into the cotton fields of Xinjiang, and has become a new menace to the cotton production in Xinjiang. The main aim of the research is, through the biological, ecological and phonological studies of Bemisia babaci and other invasive species related to crop cycling under certain circumstances in Xinjiang, and the controlling rules of local natural factors to the invasive species, to explore the ecological mechanisms of successful invasion of exotic species in Xinjiang and the related transfer mechanisms of physical, chemical, biological and man-made factors, and to prepare the theoretical basis for controlling the breaking out and spreading of invasive species.

The periphery of oasis is the transition of wilderness, which is the ecological barrier of oasis, and the increase and decrease of vegetation, pests and natural enemies, and other

ecological factors in wilderness play an important role in the occurrence of pests and natural enemies of oasis agriculture and the environmental change of ecology. This project is, by using the interaction patterns and controlling rules of plants, pests, natural enemies and other ecological factors in the transition areas of oasis, to study the protection of the biodiversity in oasis, to increase the beneficial ecological factors, to improve the resistant ability of oasis agricultural ecosystem to hazards and to the invasion of exotic species, and to provide the theoretical basis and approaches to the effective control of pests and diseases in cotton planting districts.

Qualification of applicants: Researchers from the universities and research institutions under the jurisdiction of Xinjiang Uygur Autonomous Region.

The Department of Life Sciences is responsible for handling applications.

3. The genetic basis of hybrid sterility between Oryza sativa and relative species

This project is to study the genetic basis of hybrid sterility between Oryza sativa and the relative species of AA gene groups, like Oryza blaberrima, Oryza longistaminata, Oryza rufipogon, Oryza nivara, Oryza barthii, Oryza meridionalis and Oryza glumaepatula, to locate the chief breeding gene of hybrid, to cultivate near isogenic lines, to explain the taxonomy and evolution between species of AA gene groups, and to establish a basis to unearth the beneficial gene of AA gene group relative species.

Qualification of applicants: Researchers from the universities and research institutions under the jurisdiction of Yunnan Province.

The Department of Life Sciences is responsible for handling applications.

4. Quantitative evaluation of the ecological effectiveness of quitting farmland to forest or grassland in typical sand-windy areas

The policy of quitting farmland to forest or grassland has been implemented for 6 years, and the ecological effect appears obviously. Typical sand-windy areas are ecological transition and fragile districts, and also ecotone areas of agriculture and animal husbandry. The ecological effectiveness of quitting farmland to forest or grassland bears significance to the elaboration of local land production, ecological safety and sustainable development. This project attempts to use the different models of quitting farmland to forest or grassland in typical sand-windy areas as the object, to adopt the thought of exchanging time by space (pattern), and by using plant-soil-water observation techniques, "3S" techniques and analysis methods as well as modern ecological theory, to establish the pertinently criteria system of evaluation and quantitative models, to study the functional rules between the measures for the ecological construction of quitting farmland to forest or grassland and the eco-environment, and to explore the ecological re-construction model with fine ecological

effectiveness.

Qualification of applicants: Researchers from the universities and research institutions under the jurisdiction of Ningxia Hui Autonomous Region.

The Department of Life Sciences is responsible for handling applications.

5. Basic research on the preparation and processing of winter feedstuff for flocks and herds in Qing-Zang Plateau

In Tibet, there is a serious lack of forage grass during spring and winter time, and it often becomes the period of high death of flocks and herds due to the shortage of feedstuff, especially in heavy snowing seasons. Through the study of the nutrition need of flocks and herds in Qing-Zang Plateau, the principle and features of proportioning winter feedstuff and supplement, the principle and methods of winter storage processing of pasturage, this project is to bring forward the feeding standard and nutrition need of flocks and herds in spring and winter, to solve the problem of absence and imbalance of mineral and vitamin in grass, and to search the replacement of winter feedstuff in the pasture of the Plateau.

Qualification of applicants: Researchers from the universities and research institutions under the jurisdiction of Tibetan Autonomous Region.

The Department of Life Sciences is responsible for handling applications.

6. Research on the relation between the mechanical behaviors and micro organization of tungstenized copper composite materials

By making use of the rich resources of tungsten and copper minerals in Jiangxi Province, this project is to study the relations between the mechanical behaviors and micro organization of tungstenized copper composite materials. Research mainly focuses on the effect of tungsten particle size and relative density of sintered tungsten to the mechanical property of tungstenized copper composite materials, the effect of fracture or elliptic holes to the strength of tungstenized copper composite materials, the mechanism of increasing the stiffness of interface, the fracture forms of tungstenized copper composite materials at various temperatures and under various loadings, so as to provide the theoretical and technological basis for developing high performance tungstenized copper composite materials.

Qualification of application: Researchers in the universities and research institutions under the jurisdiction of Jiangxi Province.

The Department of Mathematical and Physical Sciences is responsible for handling applications.

7. Key scientific basis and practical technology of producing fuel ethanol using grass family fibers as raw materials by fermentative methods

Taking stalks of the staple crops in Guangxi, such as leaves, sheathes and piths of sugarcane as objects, it is to study the key scientific problems and basic rules for preparing fuel ethanol by using all fibers of sugarcane after juice extracting and by considering the specificity of grass family plant, and to form further practical technologies for producing fuel ethanol. It is to research mainly the influence of different pretreatment ways on the structure of xylem fiber, the rate, degree and reclamation of sugar hydrolyzed by cellulase, as well as the toxic substances formed by microbes. On the basis of finding out suitable pretreatment ways, it is to carry out synchronous saccharified fermentation (SSF) used microbe that is able to form synchronously pentaose and hexose in fermentation.

Qualification of applicants: Researchers from the universities or research institutions under the jurisdiction of Guangxi Zhuang Autonomous Region.

The Department of Chemical Sciences is responsible for handling applications.

Jointly funded projects with Microsoft Research Institute Asia

The Department of Information Sciences and Microsoft Research Institute Asia signed the agreement to jointly fund General Program and Key Program projects. The jointly funded projects belong to the projects of NSFC, and are administered according to NSFC regulations. Research areas to be funded include network technology, multimedia technology, man-machine interface technology, natural language comprehension, information security and image and graphic technology.

Key Program projects will be funded in the following 2 research areas in 2006.

1. Software theory and technology for credible computation

It is to study the mathematical theory and development technology for high credibility software supported by boundless network and distributive computation technology. Main research contents include: 1) software reliability model and evaluation technology based on multi-types of relevant information (software system structure, formalization evaluation results, test data, etc.); 2) software credibility measurement theory and credible software methodologies; 3) software viability strategy design methods and formalization theory, demand analysis and design methods for viable software.

Research contents may not be limited to the above 3 areas. It is hoped that applicants propose innovative ideas and research plans based on previous research.

The proposed funding is 1.6 to 2 million yuan.

2. Interactive graphics processing technology and application based on vision

The proposed funding is 1.6 to 2 million yuan.

VII. Special Funds

Special funds are set up by NSFC to support or strengthen research in certain areas or aspects, and currently they include Tianyuan Fund for Mathematics, Special Fund for Basic Research on Scientific Instruments and Special Grant for Key Academic Journals. Among them, Tianyuan Fund for Mathematics and Special Grant for Key Academic Journals do not count in the limitation search for NSFC projects and the Special Fund for Basic Research on Scientific Instruments counts in the limitation search for Key Program projects. The previous Special Grant for Research on Complexity Sciences is now included in the General Program projects in the Department of Management Sciences. Please see the relevant pages in the Division I of Management Science for details. Applicants should pay attention to this change.

Tianyuan Fund for Mathematics

Tianyuan Fund for Mathematics is a special fund to support mathematical research in China to catch up the world advanced research level in the 21st century. It is open to all mathematical researchers in China and is managed by NSFC. Tianyuan Fund is coherent with NSFC's funded projects by the Division of Mathematics in giving a unified support to mathematical research. Tianyuan Fund mainly supports research in the following five areas:

1) Mathematical summer schools, summer camps for middle school students and training workshop for young teachers in the western regions of China;
2) Tianyuan Youth Grants;
3) Lectures, workshops, academic year and international cooperation and exchanges in special topics;
4) Publication of books and journals, developing computer network and improving research conditions of mathematicians;
5) Necessary education and dissemination of mathematic knowledge and research on the history of mathematics.

The aim of setting up the Tianyuan Youth Grants is to encourage young people to love the cause of mathematical research. The Tianyuan Youth Grants are open only to institutions that are qualified to award master and doctor degrees in mathematics. The qualifications for the applicants are: 1) young researchers under 35 who have their Ph.D. degrees for less than three years; 2) young researchers in less developed regions can have less restriction.

Through lectures, workshops, academic year and international cooperation and exchanges in special topics, it is to strengthen the intercrossing and application of mathematics with other disciplines, and to promote the development of mathematics.

All applications, except that for summer schools, summer camps for middle school students and training workshops for young teachers in the western regions of China, are of the free application type. For details, please contact the Office of Tianyuan Fund for Mathematics.

The time of application for Tianyuan Youth Grants is the same as the time for NSFC's projects. Others can be submitted at any time.

The Academic Steering Committee meeting of the Tianyuan Fund for Mathematics is convened every year to discuss the work of the Fund. New information will be announced on the journal *Mathematical Progress and Communications of the Chinese Mathematical Society*.

Special Fund for Basic Research on Scientific Instruments

In order to strengthen the support to basic research on scientific instruments, NSFC has set up the Special Fund for Basic Research on Scientific Instruments. The Fund is used to support innovative research or make improvement on important scientific instruments that are urgently needed in the research in frontier areas of basic research. The support is focused on:

1. Research and development of key scientific instruments and components that have important roles in promoting disciplinary development;
2. Research and development of scientific instruments and components that are needed to verify new principles and new methods.

Encouraged research areas for the projects of the Special Fund for Basic Research on Scientific Instruments will be decided according to the disciplinary needs as well as the technology basis and strength in China. NSFC scientific departments will organize and recommend research groups that have good research bases in the General Program to apply. The general application forms for NSFC's programs will be used.

The deadline for application is March 31 of the year and the department that makes the recommendation will handle the applications.

Special Grant for Key Academic Journals

Special Grant for Key Academic Journals Applications is set up by NSFC in order to improve the standards of Chinese academic journals.

The Grant is open to those natural science journals indexed by SCI, SCI-E or SCI-Search

of ISI, or those listed among the top 50 in citation ranking published by CJCR in the year of application.

Applications are open every even year. Funded journals can receive grants for two years. Funding intensity will be determined according to the budget available. In 2006 and 2007 the budget is 7 million yuan for about 30 journals.

Funding should be used mainly on the expenses in soliciting papers, editing, publication and distribution for the improvement of the overall quality of the journals. The governing agencies or host organizations of the journals being funded should provide good environment for the journals, and ensure financial and facility support in case of need.

Applicants should fill out the application form available on NSFC website (http://www.nsfc.gov.cn). Two copies of the application form with official stamp of the governing organization are required. One copy of the original search documents issued by the Center of Documentation and Information of the Chinese Academy of Sciences showing citation statistics on SCI and CJCR should be attached to the application as well as two copies of the latest issue.

VIII. Appendix

Telephone Directory of NSFC Departments and Offices

Department	Telephone	Department	Telephone
Department of Mathematical and Physical Sciences		Division III of Earth Science	62327160
		Division IV of Earth Science	62327165
Division of General Affairs	62326910	Division V of Earth Science	62327162
Division of Mathematics	62327178	**Department of Engineering and Materials Sciences**	
Division of Mechanics	62327179		
Division of Astronomy	62327189	Division of General Affairs	62326884
Division I of Physics	62327181	Division I of Materials Science	62327145
Division II of Physics	62327182	Division II of Materials Science	62327144
Department of Chemical Sciences		Division I of Engineering Science	62327136
Division of General Affairs	62326906	Division II of Engineering Science	62327098
Division I of Chemical Science	62327170	Division III of Engineering Science	62327135
Division II of Chemical Science	62327169	Division IV of Engineering Science	62327142
Division III of Chemical Science	62327172	Division V of Engineering Science	62327131
Division IV of Chemical Science	62327167	**Department of Information Sciences**	
Division V of Chemical Science	62327168	Division of General Affairs	62327146
Department of Life Sciences		Division I of Information Science	62327147
Division of General Affairs	62327200	Division II of Information Science	62327141
Division I of Life Science	62327195	Division III of Information Science	62327149
Division II of Life Science	62327197	Division IV of Information Science	62327143
Division III of Life Science	62327213	**Department of Management Sciences**	
Division IV of Life Science	62327198	Division of General Affairs	62326898
Division V of Life Science	62327192	Division I of Management Science	62327152
Division VI of Life Science	62327194	Division II of Management Science	62327151
Division VII of Life Science	62326925	**Bureau of Planning**	
Division VIII of Life Science	62326922	Division of General Affairs	623276980
Division VIV of Life Science	62327211	**Bureau of International Cooperation**	
Department of Earth Sciences		Division of General Affairs	62327001
Division of General Affairs	62327157	**Service Center for Administrative Affairs**	62327218
Division I of Earth Science	62327161	**Department of Publication**	62327204
Division II of Earth Science	62327166	**Information Center of NSFC**	62317474