Programs of Joint Funds

The joint funds are set up by NSFC and other government departments or industrial sectors to promote the cooperation of industry, university and research community, guide other governmental departments or industrial sectors to make investment in the fields or directions of mutual interests, support basic research and applied basic research, and solve basic scientific problems in practical application. 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, increasing indigenous innovation capabilities and promoting the enterprises to become the major force in making technical innovation.

The joint funds are divided into two categories: joint funds and jointly funded projects. The former supports several projects according to this guide each year for a certain period of time, and the latter funds a specific project.

Joint Fund with Guangdong and Joint Fund of Petrochemical Engineering are not divided into General Program and Key Program projects. They are categorized as one type of projects to be included in the limitation search for the number of NSFC projects. This means that applicants or principal members of the project group with senior professional titles can only apply for or undertake a maximum of 3 projects in General Program, Key Program, Major Program, Major Research Plan, programs of joint funds and other special projects that are administered as General Program or Key Program. Other projects in the programs of Joint Funds are included according to this guide in the limitation scope of respected programs. Applicants should pay special attention to this, so as not to be eliminated in the preliminary check due to exceeding the limits.

Currently the Joint Funds include NSAF Joint Fund, Joint Fund of Astronomy, Joint Fund of Iron and Steel Research, Joint Fund with Guangdong, Joint Fund of Petrochemical Engineering, the Jointly Funded Projects for Less Developed Regions, Jointly Funded Projects of Railway and Jointly Funded Projects with Microsoft Research Institute Asia. They are described below respectively.

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 the innovative ability of science and technology in 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 2006, NSAF Joint Fund received 87 applications in total. Through peer review and panel evaluation, 41 projects were funded. The total funding was 15 million yuan, with an average funding of 366,000 yuan per project. Among them, there were 2 Key Program projects with a total funding of 2.8 million yuan, 4 key funding projects with a total funding of 1.86 million yuan and an average funding of 465,000 yuan per project, 35 projects with defined goals with a total funding of 10.34 million yuan and an average of 295,000 yuan per project. Researchers in 26 units obtained funding (not including collaboration units).

The *Guide to Programs* for 2007 consists of four parts, namely, "Key Program projects", "Key funding projects", "Encouraged research areas" and "Projects with defined goals". Key Program projects will fund 1 project with about one million yuan, and open to scientists in universities and research institutes in China. Key funding projects will fund 4 projects with an average funding of 0.5 million per project, and they are open to scientists in universities and research institutes in China. In Encouraged research areas, 7 projects will be funded, and applicants can choose freely research topics in the area according to their own situation. In Projects with defined goals, 33 projects will be funded and applications must be within the subjects listed in the *Guide to Programs* for 2007. Projects in the encouraged research areas and Projects with defined goals will receive an average funding of about 300,000 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 of proposals of NSAF projects;
2. The standard application form for NSFC projects should be used, and proper information should be given according to the requirements;
3. The types of projects to be applied must be specified;
4. Applications for Key Program projects should be marked in the sub category notes;
5. Key funding projects, Encouraged research areas and Projects 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 upon;
7. Investigators in CAEP are not allowed to apply, either as principal investigators or as participants in Encouraged research areas and Projects with defined goals, which means that researchers of CAEP may not be listed in the formal name list of applicants. But they can apply projects in Key Program projects or Key funding projects. Cooperation among 2 to 3 units is encouraged in Key Program projects and 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 allowances during their stay (at least 3 months every year) in the PI's home institution 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 with the project number of NSFC, or the words "supported by the Joint Fund of NSAF, (grant number)", and the PIs must submit the final documents to CAEP according to the format given in the *Guide.* (For details, pleased see the agreement.) PIs' 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 give encouragement 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 Program projects of NSAF Joint Fund in 2007

Sequence number	Project title
F1	Studies on multi field coupling response of complex structures for storage and transportation of dangerous goods in burning environment

Notes: Researchers of CAEP may apply, and cooperation between 2 to 3 units is encouraged.

List of Key funding projects of NSAF Joint Fund in 2007

Sequence number	Project title
ZD1	Studies on metal solid-liquid phase line in giga-Pa pressure region
ZD2	Studies on the stability of interface motion and turbulent mixing
ZD3	Measurement and characteristics of land echo of 8 mm, S, L band radar
ZD4	Design and theory of local nano structure of micro scale energy materials

Notes: Researchers of CAEP may apply, and cooperation between 2 to 3 units is encouraged.

Serial number	Project title
GL1	Several basic problems in the studies of wide range equation of state of metal materials
GL2	Studies on the multiple scale numerical simulation of dynamic response of materials
GL3	Theory and experimental methods for super precision detection of non-spherical mirror surface
GL4	Method of detection of extremely weak microwave signals
GL5	Theoretical and experimental research on the equation of state of explosion generated materials
GL6	Studies on the effect of surface micro-nano treatment on the properties of metal materials
GL7	Studies on the preparation of inter-metallic compounds and properties on storing and release of hydrogen

Notes: Researchers of CAEP may not apply as PI or member of the research group.

List of Projects with defined goals in 2007

Serial Number	Project title
1	Re-calculation of the melting entropy of metal iron from the start within 5 million atmospheric pressure
2	Damage resisting mechanism of tantalum tungsten target of ultra-crystallite structure under the effect of strong electron beam
3	Studies on continuous detection method of material internal temperature

	under shock loading
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	Response process and damage mechanism of exploding fragments and shock wave in organisms
7	Adsorption enrichment of microbe to radio-nuclide
8	Theoretical and experimental research on Tetrazole and tetrazine type metal matcher
9	Synthesis, structure and properties of energy polymer materials for PBX explosives
10	Property and micro mechanism of hydrogen induced lag fracture of Austenite stainless steel
11	Relevant evolution mechanism of microstructure damage of powder metallurgical materials
12	Detection of trace components by optical fiber techniques
13	Coding and encryption of telemetric data
14	Theory and techniques of nuclear detection by CZT panel pixel array
15	Self adaptive alleviation and parametric identification of interference signals
16	Magnetic and electric energy exchange composite materials used in high sensitivity magnetic detectors
17	Optical fiber transmission, coupling and device damage effect of high power laser
18	Identification and acquisition of process characteristics of laser or electronic beam welding quality
19	Recovery of uranium contaminated soil by chelate inducing plants
20	Preparation and hydrogen sensitive effect of compound titanium dioxide nano tube arrays
21	Self-ionization and double electron compound in high energy and high density plasma
22	Techniques of detecting surface defects of strong laser optical devices
23	Technology of optical parameter amplification of quasi phase matching
24	Method of depolarization of optical pulse optical fiber
25	Characteristics of space time of light propagation in ultra short pulse laser systems
26	Spatial correction of laser beam by nonlinear optical limiting materials
27	Self assembly preparation techniques for special functional empty micro spheres
28	Preparation of machine processing low density gold porous materials
29	Preparation and interface state of ferro magnetic multi layer membrane

30	Preparation of low electron defect oxide membrane
31	Pre-processing methods and software for finite difference equations in large scale scientific computation
32	Property of damping metal materials and applications in optical systems
33	Techniques of highly stable, high temperature superconducting uniformed magnets

Notes: Researchers of CAEP may not apply as PI or member of the research group.
For detailed contents of the project titles listed above, pleases refer to separate booklet or www.caep.ac.cn.

Joint Fund of Astronomy

NSFC and the Chinese Academy of Sciences jointly set up the Joint Fund of Astronomy, which opens to all research units in China (especially non astronomy units) and aims to combine NSFC's strength in evaluation, funding and management with the function and roles of the national research platform (observation bases) in astronomical fields that are already established by the Chinese Academy of Sciences. This combination will promote the effective use of these facilities to conduct astronomical research by researchers in universities and other research institutes, develop new areas of space astronomical research, and make astronomical research in China better serve the national strategic needs.

The Joint Fund of Astronomy includes General Program and Key Program projects. Key Program projects will not specify project titles. Applicants may decide the project titles, research contents, research schemes and research funding according to the following five important scientific problems. In 2007, the Joint Fund of Astronomy plans to fund about 3 to 5 Key Program projects.

As a part of the National Natural Science Fund, the project application, evaluation and management of the Joint Fund of Astronomy will follow the regulations of NSFC and the agreement made between NSFC and CAS. In 2007, the funding will be about 15 million yuan in total.

In 2007, the Fund will support:
1) Scientists from research institutes and universities outside CAS astronomical observatory system to use optical, radio, infrared observation facilities and data to conduct observation and theoretical research on cosmology, galaxies, stars, the sun and solar systems and other basic astronomical areas; (Researchers within CAS astronomical observatory system are not allowed to apply.)
2) Research on techniques of observation in space, including new techniques and new methods of observation in space and pre-studies on key techniques of astronomical satellite, etc;

3) High energy, ultraviolet, optical, infrared and radio techniques related to astronomical observations, including the detection of week photoelectric signal, storage and transmission techniques, high energy, optical, infrared and radio techniques related to astronomical telescopes, and automated control techniques and machinery, etc;
4) Storage, computation and sharing of mass astronomical data and virtual observatory techniques;
5) Basic astronomical methods and key scientific problems arising from meeting the national strategic needs and applications.

Notes on applications

1) Before writing applications, the applicant should read carefully the regulations and the *Guide to Programs*, get familiar with the methods of implementation, requirements and responsibilities. For details, please check NSFC's website www.nsfc.gov.cn or contact the Division of Astronomy of the Department of Mathematical and Physical Sciences.
2) The Fund will give priorities to researchers from research institutes and universities outside CAS astronomical observatory system, with other conditions being equal. The researchers of CAS astronomical observatory system may take part as members in the research group in the application for the first area of research mentioned above, but may apply for and take part in other research areas.
3) The topic of application should meet the requirements of the *Guide* on research scope, and project title, specific research scheme, research content and targets, etc., are to be proposed by the applicant. Creative ideas in research are encouraged.
4) The principal investigators must have senior professional title. Limitation on the number of NSFC's projects undertaken by one researcher is applicable.
5) Please enter the proper type of project in the application form.
6) Results of the project funded during the implementation period, including papers published, books, patents, awards, etc., must be marked with "Project funded by the Joint Fund of Astronomy of NSFC and CAS".
7) The Department of Mathematical and Physical Sciences is responsible for the evaluation of the Joint Fund of Astronomy projects.

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. The funding for the first and second phase projects of the Joint Fund has been allocated, and starting from 2007, the third phase will be implemented. The Joint Fund aims at supporting basic research, applied research and development projects of scientific significance and application potentials and closely related to major problems and strategic development of Chinese iron and steel industry, such as new metallurgical technologies as well as related techniques, materials, energy, environment, equipment, information and so on.

The Joint Fund is open to scientists all over China, and proposals are accepted and processed by NSFC Department of Engineering and Materials Sciences, and administered jointly by NSFC and Baoshan Steel Complex. Applicants should observe the following aspects:

The Fund only applies to General Program and Key Program projects:
- General Program and Key Program projects of the Fund are all subject to the limitation on the number of NSFC's projects undertaken by the applicant;
- Please enter the proper type of project in the application form;
- Proper application code must be provided in the application form;
- Any application jointly made with units under Baogang Group should be reported to the S&T Development Department of Baoshan Steel Complex;
- After the completion of project evaluation, the host unit awarded the funding should sign an agreement on intellectual property rights, and send copies to NSFC for record.

The Fund advocates synergy of industry, university and research, gives priorities to support young scientific talents, encourages applications from non metallurgic universities and research institutes, and encourages further joint funding from other sources. The total funding in 2007 will be 12 million yuan.

In 2007, the following research areas will be funded:

1. Basis of environmental protection, ecological and environmental coordinated and sustainable development in iron and steel industry
- Mechanism of modification and high value added utilization of metallurgical slag;
- Chemical mechanism of removing dioxin and NOx in sintering gas by using hydrazine type materials;
- Mechanism and application of decomposing dioxin by catalysis.

2. Materials science and its application in iron and steel metallurgical industry
- Interface model for crystal interface and phase boundary of iron and steel based phases (including ferrite, austenite, cementite and separation phase);
- Functions of precious metals such as Ni, Cr, etc. in steel and possible alternative elements;
- Solidification of metals and structural changes of special metal materials in continuous casting process;
- Mechanism of hydrogen diffusion and hydrogen enbrittlement in high purity high strength thick steel plate.

3. New theory and method for surface treatment of iron and steel materials
- New types of coating and plating of iron and steel products;
- Nitrogen alloying on stainless steel surface;
- Mechanism of pulverizing hot galvanizing zinc alloy layer of steels.

4. New technologies and new equipment for iron and steel industry
● Functions of decomposition and semi coking in the coal jetting process in the lower part of COREX melting gasification furnace;
● Cold solidification agglomerant of fine ore and related basic research;
● Theory of composite casting (continuous casting of stainless steel or common carbon steel composite slab in the same mould using electromagnetic braking).

5. New theory and new method in iron and steel information technology (such as multi-scale space time simulation of metallurgical process)

In 2007, applications for Key Program projects will be accepted in the following areas:
1. Behavior of re-crystallization and laws of texture evolution of silicon steel in double roller thin belt continuous casting (E0410);
2. Mechanism of enrichment on the surface of oxidizable elements in cold rolling plate annealing process (E041004);
3. Micro alloying mechanism of super pure ferrite stainless steel (E041001);
4. Behavior and control of organization of high strength low alloy during high line energy welding (E041006);
It is to study welding structural steel with tensile strength of 490 MPa to 5900 MPa suitable for welding line energy of 100 KJ/cm to 400 KJ/cm.
5. Free application key projects in new technology and new techniques areas in iron and steel industry (E0408).

In the above areas, 3 to 4 Key Program projects will be approved.

For detailed information, please contact:
S&T Department
Baoshan Steel Complex
Room 3406, South Building, Baoshan Hotel
1813 Mudanjiang Road, Baoshan District, Shanghai
Post code: 201900
Contact person: Hu Yi and Tang Li
Tel: 021-26643935, 26643443
Fax: 021-26644233
Email: huyi@baosteel.com, tangli@baoteel.com

or,

Department of Engineering and Materials Sciences, NSFC
83 Shuangqing Road, Haidian District, Beijing
Post code: 100085
Person of contact: Zhu Wangxi and Che Chengwei
Tel: 010-62327136, 62327145
E-mail: e4m@nsfc.gov.cn, metala@nsfc.gov.cn

Joint Fund with Guangdong

NSFC and the Government of Guangdong Province jointly set up the Joint Fund of Natural Science (Joint Fund with Guangdong for short), trying to attract outstanding scientists in Guangdong and China at large to solve major scientific problems and key technical problems in the future development of economy, society and science and technology of Guangdong and the Pearl River delta region, and promote the scientific and technological development and talent team building in Guangdong Province.

As a part of the National Natural Science Fund, NSFC is responsible for receiving applications. The application, evaluation and management will follow the regulations of NSFC and the detailed procedures of the Joint Fund with Guangdong. In 2007, the proposed funding will be 46 million yuan. Specific research areas and requirements will be announced separately. Please pay attention to the announcement published on NSFC's website. Eligible applications from scientists all over the country are welcomed.

Joint Fund of Petrochemical Engineering

In order to play the guiding and coordinating role of the National Natural Science Fund, guide the social resources in science and technology to make investment in basic research and enhance indigenous innovation capability of Chinese petrochemical industry, NSFC and Sinopec, in line with the national strategic needs, jointly set up NSFC-Sinopec Joint Fund of Research (Joint Fund of Petrochemical Engineering for short) to support research on major scientific problems and key technical problems in areas of petroleum exploration and petrochemical engineering of China.

As a part of the National Natural Science Fund, the Joint Fund will be administered according to the regulations of NSFC. It is open to all scientists in China, and on a fair competition basis, selects the best to support universities and research institutions with good research capabilities to conduct research in areas specified in the *Guide to Programs*.

In order to strengthen the management, the Joint Fund of Petrochemical Engineering forms a joint management committee consisting of leaders from the two parties and some experts to make the overall planning and decisions on the Joint Fund. The management committee sets up a management office to deal with daily management of the Fund.

In 2007, it plans to fund 19 projects in 5 research areas such as basic research on conditions of forming marine oil and gas deposit in the South and directional basic research on indigenous innovation techniques of caprolactum, etc. The details are given below:

Basic research on conditions of forming marine oil and gas deposit in the South

I. Scientific goals

On the basis of making systematic summary of the existing research results, the Fund aims to support research that addresses the Paleozoic marine bed system and geological background of China, conduct research on the formation, transfer, accumulation and control of marine oil and gas mainly in upper and middle reaches of Yangtze River, explore relevant laws of oil and gas enrichment, develop innovative theory on the origins of basin, hydrocarbon formation and deposit of marine oil and gas in China, and at the same time, foster a group of professional talents in basic research on geology and oil and gas exploration and development in areas of marine oil and gas deposit research of China.

II. Main contents of research

1. Studies on south continental tectonic evolution and sediment basin material filling process

South continental tectonic geometric structure and continental formation and evolution;

Paleozoic marine basin and Miocene continental basin sediment filling process and laws of distribution;

Controls on south marine oil and gas enrichment by China marine and continental, continental and continental evolution tectonic system.

2. Formation and evolution of high quality marine hydrocarbon rock and assessment on high evolution hydrocarbon sources

Geological environmental and biological evolution and the formation of high quality marine hydrocarbon rocks;

South marine bed system multi form hydrocarbon transformation and its hydrocarbon formation process and trace;

Simulation on the process of multi dynamic formation hydrocarbon in marine hydrocarbon rocks and evolution models;

Evaluation index of high quality hydrocarbon sources in high evolution marine bed systems and potential of oil gas resources.

3. Formation and distribution of regional marine carbonate rock deposit and forecasting earthquake in the deposit layer

Tectonic and sediment environment for high quality deposit of carbonate rock and model of distribution;

Mechanism of formation of non-uniformity in carbonate rock layer and theory for the assessment of high quality deposit;

Forecasting earthquakes in the south marine dolomite and fracture deposit layer.

4. Regional rim rock and theory for making comprehensive assessment on the storage condition

Formation and evaluation of regional cap rock and effectiveness analysis and evaluation;

Formation, distribution and identification of typical regional high quality cover coat;
Theory for making comprehensive assessment on the storage condition of south marine layer system oil and gas.

5. Basic research on marine oil and gas deposit formation in other regions of China
Mechanism of the formation of oil and gas in deep carbonate rock in Tarim Basin and prediction on its distribution;
Hydrocarbon rock distribution in North China platform and potentials of hydrocarbon formation;
Nature of Xingmeng Trough and its significance in petroleum geology;
Tethys tectonic evolution and laws of enrichment of marine oil and gas in Qinghai-Tibetan region;
Distribution of carboniferous-Permian system in northeast China and potential of hydrocarbon formation.

6. Theoretical research on the mechanism of formation of large and medium regional oil and gas deposits and theory of hydrocarbon formation and deposit formation
Basic theories on the formation of oil and gas deposit in marine bed;
Formation of oil and gas deposit and laws of enrichment in south marine carbonate rocks.

III. Research period: 3 years.

IV. Amount of joint funding: 44 million yuan.
The Fund plans to support about 15 projects in the above research areas, with 2.5 to 3.5 million yuan per project.

Directional basic research on indigenous innovation techniques of caprolactum

Scientific goals:
The Fund will support research that addresses key scientific problems and technologies such as cyclohexane oxidation, cyclohexanone oxamidine, benzene plus hydrogen making cylcohexane, etc., conducts directional basic research, accumulates new scientific knowledge, forms new ideas of original innovation and integrated innovation, conducts exploratory research and strives to make breakthroughs.

Main contents:
Scientific bases of making integrated innovations on making cyclohaxanone oxime from oxamidine by catalysis of cyclohexanone titanium silicon molecular thieve;
New reaction engineering of making cyclohexanone by cyclohexane oxidation;
One step preparation of cylcohexanone oxime with cyclohexane as raw materials (to reduce the step of making cylcohexanone);
One step preparation of caprolactum with cyclohexanone as raw materials (reduce the step of making cylcohexanone oxime).

Research period: 3 years.

Amount of joint funding: 3.5 million yuan.

Scientific bases of making innovative use of bio diesel in chemical engineering

I. Scientific goals

The fund supports research that studies the relation of the structural composition of aliphatic acid methyl ester and lubrication and solubility, further processing of glycerol and using aliphatic acid methyl ester to produce high value added chemical products; accumulates knowledge, masters the laws, forms original innovative and integrated innovation ideas, conducts exploratory research to find out the technical feasibility and economical benefit, so as to lay a scientific foundation for developing new technologies.

II. Main contents

1. Scientific bases of direct utilization of aliphatic acid methyl ester

Structural composition of aliphatic acid methyl ester and laws of lubrication;

Structural composition of aliphatic acid methyl ester and laws of solubility.

2. Scientific bases of further processing of glycerol

Structural characterization and reaction mechanism of synthesizing propylene catalyst using glycerol with selective addition of hydrogen;

Structural characterization and reaction mechanism of synthesizing epoxy chloro-propane using glycerol with selective chlorination.

3. Basic research on the science and techniques of using aliphatic acid methyl ester to produce high value added chemical products

Studies on supercritical media and phase balance in reaction system of aliphatic acid methyl ester with supercritical addition of hydrogen and explorations on new technologies;

Basic research on the laws of reaction and reaction engineering of synthesizing aliphatic acid methyl ester sulphonate by sulphonation of aliphatic acid methyl ester and explorations on new technologies.

III. Research period: 3 years.

IV. Amount of joint funding: 3.5 million yuan.

Basic research on the structural characterization and important problems of vistanex

I. Scientific goals

The Fund will support research that addresses key scientific problems in polymer chain structure and condensed state structure related to high performance polyolefin materials,

studies on the structural characterization and the relation between structure and performance, realizes active regulation on molecular chain structure and condense state structure, and speeds up commercial process of new techniques and new products of polyolefin.

II. Main contents

1. Phase separation characterization of reactor alloying compound;
2. Structural characterization of low density polyethylene branching;
3. Mechanism of regulation by reduction rate in forming of polypropylene.

III. Research period: 3 years.

IV. Amount of joint funding: 3.5 million yuan.

Basic research on catalysis chemistry and reaction engineering of preparing low carbon alkenes

I. Scientific goals

The Fund will support research that addresses key problems in catalysis chemistry and reaction engineering related to increasing the production of low carbon alkenes such as ethylene and propylene by new techniques of catalysis, especially the development of high stability catalysts and the engineering application of reaction and regeneration techniques, research that studies the relationship between the structure and performance of catalysis materials used in the catalysis reaction for increasing the production of low carbon alkene and the basic laws of reaction, inactivation and regeneration, research that solves key problems of catalyst and increases engineering scale, and research that promotes the commercialization of the new techniques of increasing the production of low carbon alkenes.

II. Main contents

1. Mechanism of coking in decomposition reaction using light hydrocarbon as catalyst and key engineering problems of regeneration;
2. Mechanism of the interaction between surface structure of alkenes as translocation catalyst and polar molecules;
3. Key problems in the catalysis of making propylene by de-oxygenation of propane and reaction engineering.

III. Research period: 3 years.

IV. Amount of joint funding: 3.5 million yuan.

Notes on applications:

1. Applications in the first area are evaluated by the Department of Earth Sciences, and the areas 2 to 5 are evaluated by the Department of Chemical Sciences.

2. Topic of research in the application should be in agreement with the main research areas listed in this guide. It should stress on making innovations in science and technology, focus on stating how to solve scientific problems and key technical problems in the area, and on the basis of summarizing past research results and the trend of development, submit the application with academic innovation and prospect of applications. The applicant determines the title of the project. Applications that are not in agreement with this guide will not be accepted.

3. Papers, monographs, research reports and appraisal documents, etc., should all be marked with "Project funded by NSFC-Sinopec Joint Fund of Research (project approval number).

4. Prior to publication of the research results, if related to confidential materials on the production and technology of Sinopec, permission from Sinopec must be obtained.

5. Intellectual property rights arising form the research will be dealt with according to government regulations. Sinopec may sign supplementary agreement with the host units on intellectual property rights, so as to promote the extension and practical applications of research results.

6. The Fund is managed as Key Program projects, so the applicant is requested to observe regulations of Key Program.

7. The Fund is included in the limitation search of NSFC's projects. Applicants with senior professional title may not exceed 3 projects in applying or undertaking NSFC's General Program projects, Key Program projects, Major Program projects, Major Research Plan projects, Joint Fund projects, and other projects administered as General Program or Key Program.

Jointly Funded Projects

Jointly Funded Project for Less Developed Regions

1. Basic research of the pathogenical bacterium of potato late bligh.
It is to support researchers to study the gene and function of Phytonphthora infestans for the formation, bourgeon of sporangium, and to understand its expression and participant cellular process, so as to supply new and more effective methods for the prevention of late bilgh of potato.

Qualification of applicants: Researchers from universities and institutions under the jurisdiction of Inner Mongolia Autonomous Region.

The Department of Life Sciences is responsible for handling applications.

2. Molecular mechanism study of fruit quality variation of Nanfeng Orange

It supports researchers to take the typical fruit germplasm resources of Jiangxi, Nanfeng orange as the material, aims at the current production situation of fruit quality variation of Nanfeng orange, and by using theory and method of modern molecular biology, to analyze the reason of the quality variation, to find the genetic mechanism of quality variation, and to supply a theoretical and technique basis for the quality improvement of Nanfeng orange.

Qualification of applicants: Researchers from universalities and research institutions under the jurisdiction of Jiangxi province.

The Department of Life Sciences is responsible for handling applications.

3. Separation and control mechanism study of development correlated genes of biphase development of maculation and imago of protoscolices

Based on the growth and development characters of *Echinococcus granulosus*, it supports researchers to separate the typical sacculation of protoscolices and the imago genes, to explore the expression/restrain of those genes, and the inter regulate to control the biphase development and the infectious of acanthor, protein regulation during the process of development, the interaction of signal transduction and protein, so as to supply the basis for the growth and development and pathogenic mechanism, and to supply candidate genes and approaches for the research of vaccine and new drugs filtering.

Qualification of applicants: Researchers from universities and research institutions under the jurisdiction of Xinjiang Uygur Autonomous Region.

The Department of Life Sciences is responsible for handling applications.

4. Absorption and accumulation features to deleterious elements and their ecological differentiation of Yunnan tea

It supports researchers to analyze the residual features of deleterious elements among the tea varieties of chief production districts in Yunnan, to study the principle of transfer and accumulation of the deleterious elements between the system of soil tea-tree and its key ecological process, to understand the ecological differentiate level for the absorption of the elements from different populations of species and the ecological community features to avoid absorbing the deleterious elements, and to supply the theoretical support and regulation method for improving the level of standard planting of tea.

Qualification of applicants: Researchers from universities and research institutions under the jurisdiction of Yunnan Province.

The Department of Life Sciences is responsible for handling applications.

5. Research on the identification and separation of Buffalo XY sperm by using Raman spectrum and microfluidics

It supports research that makes use of the advantage of buffalo milk industry in Guangxi, by using NIR laser optical tweezers to captivity single sperm of buffalo, to obtain its Raman spectrum, and research that, by the establishment of active sperm Raman spectrum database, sets up the spectrum model of health XY sperm of buffalo, identifies XY sperm on this basis, and then to prefer the sperms pollutant-free by microfluidics technique, so as to supply a theoretical basis and technique means for increasing the number of reproducing female buffalo and improve the quality and output of milk.

Qualification of applicants: Researchers from universities and research institutions under the jurisdiction of Guangxi Zhuang Autonomous Region.

The Department of Life Sciences is responsible for handling applications.

6. Synthesis, structure and properties of new types of perovskite-like non-ferrous metal composite oxides

It supports research that makes use of the abundant natural resources of nonferrous metals in Guangxi Zhuang Autonomous Region to carry out research on the design and synthesis of a series of new types of perovskite-like non-ferrous metal composite oxides, the corresponding crystal structure analysis, the effect of the type and quantity of cation inside and outside oxygen octahedron on the formation of crystals, the spectral characteristics of perovskite-like structure with different composition, and the test and study of the dielectric, piezoelectric and ferroelectric properties, and research that reveals the relationship among the composition, structure and bonding, and that studies the influences of perovskite-like structure on dielectric characteristics through both theoretical and experimental researches, which will help pave the way for the discovery of new perovskite-like dielectric, piezoelectric and ferroelectric materials.

Application requirements: Applicants must be researchers from universities and research institutions under the jurisdiction of Guangxi Zhuang Autonomous Region.

The Department Engineering and Materials Science is responsible for handling applications.

7. Basic research on the pathogenesis and cure of epilepsy

Epilepsy is one of the nerve system diseases with bigger jeopardization, and it is also a common and frequent disease in Ningxia. As for insula, the fifth part of the brain, it is not clear for its detailed anatomy and its special function. The pathological changes in this area often show the occurrence of epilepsy, and for a long time they have been considered as frontal lobe epilepsy, whereas, the occurrence of epilepsy originated from insula probably is the key problem for the non effect of surgical treatment and causing difficult epilepsy. This project uses epilepsy as the carrier and insula as the research

object and adopts nerve anatomy, functional imaging, nerve electro physiology and other molecular biology techniques to study insula and relevant areas causing the occurrence, development and spreading, to explore the nerve function of insula, its functional plasticity and its surgical cure, and to supply a theoretical basis for insula function and the diagnosis of insula relevant epilepsy.

Qualification of applicants: Researchers from universities and research institutions under the jurisdiction of Ningxia Hui Autonomous Region.

The Department of Life Sciences is responsible for handling applications.

8. Research on typical, rare and endangered plant resources in Tibet
The requirement of this project is to collect relevant references of typical, rare and endangered plant resources in Tibet, to establish the database of germplasm of such plant resources, and to study the biological features and reasons of their threats.

Qualification of applicants: Researchers from universities and research institutions under the jurisdiction of Tibetan Autonomous Region.

The Department of Life Sciences is responsible for handling applications.

Note: Items 7 and 8 do not appear in the paper version of the *Guide to Programs*, while they do exist in the website version.

Jointly Funded Projects with Railway

NSFC and the Ministry of Railway set up the Jointly Funded Projects with Railway. The Fund is open to all scientists in China, aims at attracting researchers in Chinese universities and research institutions to participate in basic research on scientific and technological development of the railway, enhance the original innovation capabilities of Chinese railway science and technology, and make contributions to the leapfrog development of Chinese railways.

As a part of the National Natural Science Fund, NSFC and the Ministry of Railway are jointly responsible for the management according to the regulations of NSFC, and the applications will be accepted and evaluated by the Department of Information Sciences of NSFC. The year 2007 is the second year for the implementation of the Jointly Funded Projects with Railway. The total funding will be 4 million yuan, which mainly supports basic research related to information technology that improves the safety and benefit of railway operation. In 2007, the Fund plans to support 12 to 13 General Program projects and 1 Key Program project. The General Program project is about 250,000 yuan per project for 3 years, and the Key Program project is about 1.8 million yuan per project for 4 years.

Notes on applications:
1. Applications should be within the research areas announced in the *Guide*;
2. Applications will be included in the limitation search for undertaking NSFC's projects;
3. Proper categories and application code should be chosen in the application form.

In 2007, applications for General Program projects in the following areas will be accepted:
1. Theory and technology of railway information network safety;
2. Theory and technology for train operation control;
3. Theory and method of comprehensive automation of marshalling stations and operation optimization;
4. Theory and simulation of train command and schedule;
5. Theory of railway control system safety and methods of evaluation and accreditation;
6. Theory and technology of intelligent management of railway transportation;
7. Theory of the organization and simulation technology of passenger and goods transportations;
8. Theory and methods of the optimal recovery of late trains and precise positioning of trains;
9. Theory and methods for the optimization of train schedule.

In 2007, applications for Key Program projects in the following areas will be accepted:
Theory and method for the simulation of train operation control system;
Research that addresses the practical needs of train operation controls in China, which focuses on 1) theory and methods for the simulation of train operation control system; 2) embedded and scalable simulation system structure for the control of train operation; 3) high dependability simulation platform of control system of train operation. Part of research findings need to be applied or verified in real application of train control operation.

Contact information:

Department of Information Sciences, NSFC
Address: 83 Shuangqing Road, Haidian District, Beijing
Post code: 100085
Persons of contact: Wang Chenghong and Song Su
Tel: 010-62327149
Email: Zidonghua@nsfc.gov.cn

or:

Department of Science and Technology
Ministry of Railway
Address: 10 Fuxing Road, Beijing

Post code: 100844
Persons of contact: Zhou Li and Huo Baoshi
Tel: 010-51841093
Email: Huobs@sina.com

Jointly Funded Projects with Microsoft Research Institute Asia

NSFC Department of Information Sciences and Microsoft Research Institute Asia plan to jointly fund projects of General Program and Key Program. 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. Total funding is 6 million yuan.

In 2006, 12 applications for General program projects were received and 7 were funded with an average funding of 281,400 yuan per project. 6 applications for Key Grogram projects were received and 2 were funded, with an average grant of 2 million yuan per project.

Key Program projects will be funded in the following research areas in 2007.

1. Coordinated description and intelligent transmission of video information in wireless distribution environment (F01)

Suggested research contents:
1) Coordinated acquisition and description of video information in wireless distribution environment;
2) Intelligent transmission of video information in wireless distribution environment.

The proposed funding is 1.5 to 2 million yuan.

2. Research on the next generation of information search (F02)
It is to study the theory and techniques of customer centered, more precise, intelligent and personalized next generation information search. Main research contents are:
1) Modeling, evaluation and measurement of personalized information search;
2) Acquisition and learning of customers' interests and preferred search;
3) Digging of customer's social network and its applications in personalized information search;
4) Selection and integration of information from multiple information sources.

Research contents may not be limited to the above areas. Applicants are encouraged to propose innovative ideas and research scheme according to previous research background.

The proposed funding is 1.5 to 2 million yuan. Usually the jointly funded key projects are for 4 years.

In 2007, some General Program projects are to be funded. Application code can be F01, F02, F03, F04 or F05. Usually the research is for 3 years, and the amount of funding is 250,000 to 300, 000 yuan per project.

Proper categories and application code should be entered in the application form. The jointly funded projects are also included in the limitation search for NSFC's projects.