MoST 1 - National Basic Research Programme (973 Programme)

Introduction to the programme

The National Basic Research Programme, also called “973 Programme”, is a major Chinese national research programme launched by the Chinese Ministry of Science and Technology (MoST) in 1997. The 973 Programme gathers strong expertise with a focus on key basic research projects in the field of agriculture, energy, information technology, resources and environment, population and health, and materials, among others, in order to develop China’s research capacity in key disciplines and interdisciplinary fields, and find comprehensive solutions to major issues in China’s development.

National agency managing the programme

Chinese Ministry of Science and Technology (MoST)

Structure and research topics covered

In 2013, the 973 Programme published calls for proposals in the fields listed below:

1. Agriculture:
   - Genetic mechanisms of farm animal reproduction and excellent production traits
   - Research on molecular mechanism of the reproductive development and improvement of heterosis utilization efficiency of major crops
   - Basic research on farm animals safe and efficient cultivation
   - Research on crop organ aging molecular basis and the regulation of the yield and quality traits
   - Basic theory related to deep oil and gas
   - Research on molecular mechanism of the formation and regulation of crop fatty acids and special nutrients
   - Control mechanism and integrated control of agricultural and forestry pest biology
   - Pollutant formation and control of ultrafine particles formed during combustion of fossil fuels
   - Basic research on improving grassland productivity and farm water and nutrient efficient utilization
   - Genetical mechanisms of farm animal reproduction and excellent production traits
   - Biological research utilization of fungus and the prevention and control of pathogenic fungi

2. Energy:
   - The prevention of geological disasters in the coal mining and ecological and environmental protection
   - Basic research on efficient development of shale gas production
   - Production of high-grade biomass liquid fuels
   - Energy management and operational control of smart grid
   - Research on major issues related to effective utilization of industrial waste heat
   - Power machinery’s efficient and clean thermal power conversion
   - Basic research on improving grassland productivity and farm water and nutrient efficient utilization
   - Control mechanism and integrated control of agricultural and forestry pest biology
   - Pollutant formation and control of ultrafine particles formed during combustion of fossil fuels
   - Basic research on farm animals safe and efficient cultivation
   - Genetical mechanisms of farm animal reproduction and excellent production traits
   - Biological research utilization of fungus and the prevention and control of pathogenic fungi
3. Information Technology:
   - Research on original new information devices with important application prospects
   - Research on photon and electron devices and technology for energy saving and environmental protection
   - Theoretical study of intelligent collaborative network
   - Transmission theory and methods for multi-dimensional resources and new application environment
   - Basic theory and methods of Chinese language information processing and in-depth calculation in the Internet environment
   - New calculation theories and methods of perception and cognition
   - Research on password security in the network environment
   - Basic research on social network analysis and network information dissemination

4. Resource and Environment:
   - Typical back-arc basin hydrothermal activity and its mineralization mechanism
   - Research on Northern China Xingmeng Orogenic Belt structural composite and large-scale mineralization
   - Ecological and hydrological processes, mechanism and regulation of vegetated stabilized sand
   - Characteristics, effects and control of environmental pollution of heavy metals
   - Monitoring, evolution mechanism and forecasting techniques of strong convective weather systems
   - The changing patterns, mechanism, impact and countermeasures against droughts and floods in China, within the context of global warming
   - Typhoon regulation, response mechanism and forecasting model of upper ocean
   - Impact of sea/lake reclamation on the wetlands and coastal ecological environment and resources and related measures

5. Health Sciences
   - Basic research on immune response, immune regulation and immune-related diseases
   - Pathophysiological mechanism of fat metabolism and obesity
   - Biological basis of organ aging and age-related diseases
   - Basic research on the pathogenesis of senile dementia and clinics
   - Pathogenesis and intervention of heart failure or arrhythmia
   - Mitochondrial dysfunction and its pathogenic mechanisms and intervention strategies
   - Environmental and genetic mechanism of cancer
   - Neurobiology of depression
Chinese medicine theory topics
- Important infectious disease basic research topics

6. Materials
- Research on light-emitting materials and devices for optical interconnection use of silicon chips
- Low-cost, high ductility of lightweight and high strength magnesium alloy materials
- Scientific basis for synthetic lubricating materials, friction reduction and energy-saving
- Research on new key materials for energies production
- Basic research on clean and efficient use of complex multi-metallic mineral resources and non-traditional resources
- Optoelectronic functional materials based on ordered micro-structure
- Corrosion pattern and protection of materials in the marine environment
- High-performance sound functional materials

7. Manufacturing and engineering sciences:
- High-end equipment design, manufacture, operation and control
- High-performance parts/components manufacturing
- Multi-scale precision manufacturing of and micro-nano manufacturing
- Intelligent equipment and bionic manufacturing
- Fundamental issues related to design, construction and operation of mega water irrigation, marine, transport engineering project infrastructure
- Safety of the entire life cycle of major engineering structures and engineering systems
- Environmentally friendly and sustainable development of major projects
- Simulation and verification for manufacturing and engineering sciences

8. Integrated Multidisciplinary Sciences
- Multidisciplinary research on aircraft related topics
- Early warning, prevention and control of major disasters and public safety
- Earth observation, navigation and position perception
- Urban and inter-city traffic network engineering
- Important scientific issues in the energy saving
- Synthetic Biology
- Green Chemical and Biological Chemical Process Engineering
- Interdisciplinary research in life sciences and biotechnology

9. Major scientific frontier
- Cutting-edge scientific research carried out by major national scientific projects
- Cutting-edge scientific research carried out by major international cooperation
projects

- Other cutting-edge multidisciplinary scientific research expected to achieve major breakthrough

10. Nanotechnology

- Basic scientific issues of nano-materials
- Accurate preparation, controlled assembly and functional integration of nanomaterials
- New processing and characterization techniques of nano-materials and structures
- New generation of nano-device fabrication, integration and performance
- Biomedical nanomaterials with significant disease detection technology
- New drugs based on nanotechnology
- Energy Nanotechnology Materials and Technologies
- Environmental Nano Materials and Technology
- Nanoscale materials and devices for the strategic emerging industries
- Nano-materials and technology for promoting traditional industrial optimization and upgrading and energy conservation
- Scaled preparation and evaluation of nano-materials and devices

11. Quantum control research

- Quantum computing based on solid-state qubit
- The nature and regulation of cold atoms and dipolar quantum gases
- Ordered quantum phenomena and their field of regulation
- Regulation of the electron spin, valley and other intrinsic degrees of freedom in the new quantum materials
- Solid-state quantum devices and circuits
- Regulation of electronic charge and spin in molecular system
- Regulation of molecules, atoms, electron by ultrafast optical field
- Photonic - electronic state coupling and regulation in high quality factor microcavity

12. Protein

- Structure-function relationship of important protein complexes
- Structure of membrane protein function
- Physiological and pathological activities of Proteome
- New technologies and new methods of studying proteins
- Regulation of protein translation and modification
- Regulatory mechanisms of important proteins related to tumor development
- Function and mechanism of important protein of metabolic regulation process
- Protein interaction networks and functional study

13. Development and reproduction

- Cellular and molecular basis of tissue
development

- Molecular mechanisms of organ development, aging, or regeneration
- Molecular mechanisms of abnormal tissue/organ development
- Molecular networks that control mechanisms of plant development of vital organs and pollination fertilization
- Regulatory mechanism of primordial germ cell fate determination and gonadal development
- Spermatogenesis sophisticated genetic and epigenetic regulation
- Molecular mechanisms of oocyte maturation and early embryonic development
- Molecular association of hormonal, metabolic disorders, or environmental factors and reproductive dysfunction

14. Stem cell research

- Stem cell development Immunology
- Basic biology of cancer stem cells
- Directed differentiation of pluripotent stem cells and the mechanism
- Molecular mechanism of cell reprogramming
- Molecular identification of stem cell-based repository of stem cell markers
- Stem cells and microenvironment interaction and its mechanism
- Methods and mechanisms of major diseases’ stem cell therapy
- Basis of stem cells treating visual system diseases and clinical translational research

15. Global change research:

- Marine multi-scale change processes, mechanisms and predictability
- Settlement effects of marine nitrogen dynamics and atmospheric materials
- Track - sub-orbital scale Warm Period and the Asian Monsoon System in last 2000 years
- Climate effects of cloud and aerosol
- Co-evolution of terrestrial ecosystems and climate environment and continental weathering erosion
- Key typical epicontinental elements’ response to global change
- Land-sea interaction studies
- Model of carbon cycle

Further explanation of the topics is available in Chinese at:

Budget

The budget for each project has three categories:

- Type A: approx. 50 million Yuan (6 million Euros);
- Type B: approx. 35 million Yuan (4.2 million Euros);
- Type C: approx. 15 million Yuan (1.8 million Euros).

The supporting period is normally five years.
Rules of participation and funding

- The applicants should be scientific institutes, universities or companies registered in mainland China with legal person status, strong basic research capability and conditions.
- Each application should have one lead applicant (“Chief Scientist”), and the lead applicant should meet the following requirements: age below 60 (including 60), with excellent academic performance, good coordinating skills and reputation, and can devote himself/herself to the project with the majority of his/her time.
- The applicants can not apply for two or more projects under the national science and technology programmes in the same application period.
- Outstanding foreign scientists from Hong Kong, Macao, Taiwan and overseas can also be main project applicants, if they meet the basic requirements and hold a formal position with a Chinese host organization.
- The lead applicant should belong to a Chinese university, research institute, or a company legally set up in mainland China.
- The leading applicant should work on the project for no less than six months per year.
- International cooperation is encouraged. Projects involving EU partners should be submitted according to the Science and Technology (S&T) Cooperation Agreement between EU and China. The assessment and project approval procedures are the same as those of other projects.

Deadlines

Applications are to be accepted during a specific period each year. In 2012, the project applications can be submitted from 25 March till 9 April.

How to apply

All the applications should be submitted online at: http://program.most.gov.cn. Before the application starts, applicants may get a comprehensive understanding of the application rules by visiting the following websites: http://www.973.gov.cn/English/Index.aspx; http://program.most.gov.cn.

The general application procedure is as follows:

1. Lead Applicant Registration: Lead applicant should be registered at: http://program.most.gov.cn.
2. Application Proposal Completion: applicants should choose a suitable research topic, write the application proposal and submit it online.
3. Evaluation by the Project Organization Unit: Project Organization Unit should review and evaluate the application forms, and submit the eligible ones to MoST through the online platform.

Interested foreign researchers or organizations should consult their Chinese partners about the possibility of applying for a fund.

Evaluation criteria

Not available.
Links and contacts for more information on the programme

Applicants may contact MoST if they have questions regarding project application or requirements:

- Basic Research Management Center, MoST
  Email: jcc973@vip.sina.com
  Tel: +86-10-58881072, +86-10-58881073, +86-10-58881076
  Fax: +86-10-58881077