

## Vice President Shen Wenqing Interviewed by Asahi Shimbun



In order to introduce to the Japanese public about the cooperation between China and Japan in basic research as well as the funding policies, layout, effectiveness, opportunities and challenges of the National Science Foundation of China (NSFC), Professor Shen Wenqing, Vice President of NSFC, was interviewed by Mr. Tetsu Kobayashi, chief correspondent of Asahi Shimbun Guangzhou Bureau on January 26, 2011. It is the 2nd interview of Professor Shen by Asahi Shimbun, which is one of the most influential newspapers in Japan with a history of over 130 years since its first issue of publication.

Professor Shen began with reviewing the cooperation between NSFC and scientific community of Japan, gave introductions to various cooperation and exchanges in science and technology including substantial cooperative projects, newly started comprehensive exchanges and high-level mutual visits with Japan Society for the Promotion of Science (JSPS) and Japan Science and Technology Agency (JST), two major funding agencies of Japan. Professor Shen commented: “We have a very good cooperative framework with Japan.” Professor Shen then introduced the funding policies, layout, growth and distribution of NSFC and the consequent opportunities and challenges. He, in particular, pointed out that NSFC in recent years attached importance to international scientific and technological cooperation, the fund of which had exceeded the average growth rate of overall NSFC budget.

Professor Shen also shared his views about the rapid S&T development of China over the recent years. He deemed that although China had been ranked among the forefront countries in the number of articles published, but the citation rate was less than the world average and the world-leading core technologies were few in the country. Change from quantity to quality is definitely needed for China. Japan had passed the stage, in the process of which, China needed to learn from Japan.

As for the reform of scientific research system and funding management, Professor Shen said that China faces different problems despite of its similarity to overseas scientific research management system. China will make greater breakthrough in funding system, evaluation system, incentive mechanism and output for achievements of scientific research during the period of 12th Five-Year Plan. Science community is supposed to come to consensus step by step through interaction and meet the changes in all aspects. He expressed his willingness to further discuss such issues with Japanese institutions and scholars.

Regarding the question by Mr. Kobayashi on the proportion of basic research to applied research in the funding layout of NSFC, Professor Shen believes that basic science is closely related to social development nowadays. Basic research needs to give more consideration to national concerns, social development and human well-being. NSFC now sets up its strategic orientation of “more emphasis on basic research, frontier research and talents training”. The funding agency will pay attention to basic scientific issues facing our national economy and social needs while attach importance to traditional basic disciplines like mathematics, physics, chemistry, astronomy, earth and biology.

Mr. Kobayashi showed special interest in several ongoing or under-construction large-scale physics experiments in China and believed that some of those researches would possibly lead to Nobel Prize in certain area. With great interest as well, Professor Shen introduced NSFC-funded projects like the dark matter research base in Jinping Mountain, Sichuan, the Neutrino Experiment in Daya Bay Reactor, Yangbajing Cosmic Ray Observatory and Shanghai Light Source accelerator.

Professor Shen expressed wishes to Mr. Kobayashi in the end and hoped Asahi Shimbun would do more publicity work for the promotion of Sino-Japanese scientific and technological cooperation.

Officers from NSFC General Office and Bureau of International Cooperation also attended the interview.

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## **State Councilor Meets with IEC Chairman**

On June, 15th, 2011, State Councilor, Madam. Liu Yandong met with Mr. Zare, Chairman of the International Evaluation Committee (IEC) for the funding and management performance of the National Natural Science Foundation of China (NSFC), former chairman of the National Science Board in Beijing. Mr. Han Qide, Vice Chairman of IEC, Vice Chairman of the Standing Committee of NPC, and Mr. Winnacker, former President of DFG, were also present at the meeting.

Madam. Liu addresses the significance of IEC’s evaluation on NSFC’s performance on funding and management during past 25 years, which is the first time for the management of the science fund in China. Based on the principles of independence, objectivity, impartiality, and bearing a rigorous scientific attitude, IEC conducted an high-quality, efficient, comprehensive and systematic evaluation, which is not only highly instructive on improving the management performance of the funding for natural science in China, but also sheds light on the scientific management for other sectors concerned in China. NSFC is expected to stage more remarkable performance based on the evaluation results to promote construction, reforms and development of the National Natural Science Fund.

The international evaluation is accomplished in more than one year by an international expert panel of 13 senior scientists from 6 countries.

# Kickoff Meeting for A3 Foresight Program held in China

The kick-off meeting and first workshop for the study of “Composite Photocatalytic Systems for Efficient Water Splitting by Solar Energy” under the A3 Foresight Program was held in Dalian Institute of Chemical Physics (DICP), Chinese Academy of Sciences (CAS) on January 10th, 2011. Professor ZHANG Tao, Director of DICP delivered welcome remarks in the opening ceremony. Professor ZHANG Yinglan, Director of Division, Bureau of International Cooperation, National Natural Science Foundation of China introduced the background and funding status of the A3 Foresight Program jointly supported by China, Japan and Korea. Professor LI Can, an academician of CAS gave a report regarding the arrangement of the study and elaborated the important role of surface junction and dual cocatalyst in enhancing the activities of photocatalysts. Professor Jun Kubota from Japan and Professor Kanak P.S.Parma from Korea also addressed about the cooperation of A3 Foresight Program. 32 scientists from China, Japan and Korea made presentations on their respective progress and ideas about future research in the photocatalytic area.

National Natural Science Foundation of China (NSFC), Japan Society for the Promotion of Science (JSPS) and National Research Foundation of Korea (NRF) has jointly funded the project of “Composite Photocatalytic Systems for Efficient Water Splitting by Solar Energy”, whose three PIs are Professor LI Can from DICP, CAS, Professor Kazunari Domen from Tokyo University and Professor Jae Sung Lee from Pohang University of Science and Technology. The purpose of the study is to solve the key scientific issues by conducting in-depth study of efficient conversion between solar energy and chemical energy through complementary advantage of association with strong partners, thus leading to breakthrough progress in the area of photocatalyst splitting water to make hydrogen.

As an important renewable energy, solar energy has a unique advantage and tremendous potential for further development. “Photocatalyst splitting water to make hydrogen by solar energy” is one of important research areas in solar-chemical energy conversion, of which the quantum efficiency however is very low now, a far cry from industrial application and still in the basic research stage. To achieve efficient conversion and utilization of solar-chemical energy, it is necessary to study in-depth the key scientific issues of solar-chemical energy, such as light absorption, generation, separation, transfer and transmission of photo-deducted electrons and the photocatalytic reaction process in the surface. Only by knowing these issues and establishing energy conversion theories and experimental basis, the highly-efficient photocatalytic system could be established to split water for hydrogen production.

In the two-day meeting, scientists from China, Japan and Korea had discussions not only on academic issues in the area of photocatalyst, but also had cultural exchanges which laid a good foundation for further collaboration. The three sides all agreed that the next workshop will be held tentatively in 2012 in Japan.

## **Twelve Billion Yuan RMB for NSFC Programs in 2011**

In 2011, the Central Government will continue to make a remarkable increase funding for the National Natural Science Fund. The planned amount of funding reaches 12 billion RMB with an increase of over 16% of that of the last year.

At the 4th Plenary Session of the 6th NSFC General Assembly held on March 23rd, NSFC President Chen Yiyu said that the Central Government would increase the funding of NSFC in 2011 and the total amount of NSFC funding will reach 12 billion RMB. At the same time, some adjustments will be made to NSFC funding portfolio, e.g. there will be an extension of funding duration and an increase of average funding per project.

President Chen said that NSFC will adjust its funding amount and duration during the Twelfth Five-Year Plan in accordance with the principle of “attaching higher priority to the most fundamental scientific disciplines, research frontiers and fostering talents”: for the General Program, the duration will be extended from 3 years to 4 years, and, from 4 years to 5 years for the Key Program. Average funding per project for the General Program will be raised from 347,000 yuan of 2010 to 600,000 yuan and for the Key Program from 2.21 million yuan to 3 million yuan. Average funding per project for the Young Scientists Fund program will be increased to 250,000 yuan. For the Fund for Less Developed Regions, average funding per project will be increased to 500,000 yuan.

He also mentioned that the evaluation for around 119,000 applications were organized in 2010 and 26,580 of them were funded according to their scientific merits. The total amount of funding reached around 9.653 billion RMB, including 13,030 General Program projects with 4.5 billion RMB, 436 Key Program projects with 0.97 billion RMB, 14 Major Program projects with 0.14 billion RMB, and 444 Major Research Plan projects with 0.486 billion RMB.

During the period of the Eleventh Five-Year Plan, NSFC utilized government funding of around 30.04 billion RMB, funded over 92,000 research projects, and supported about 633,000 person-time research talents. NSFC was founded in 1986. It is responsible for the organization, implementation and management of NSFC programs, and financially supporting basic research and applied basic research across the country in line with the national strategy, policy and trends of science and technology. NSFC’s funding comes mainly from the Central Government.

By types of projects, NSFC’s funding programs are categorized into Key Program, Major Program, Major Research Plan, National Science Fund for Distinguished Young Scholars, Joint Research Fund for Overseas, Hong Kong and Macao Scholars, Science Fund for Creative Research Groups, National Science Fund for Fostering Talents in Basic Science, Special Fund, Joint Funded Projects and International (Regional) Joint Research Program. As the central government keeps increasing the investment in basic research, the funding of NSFC has grown from 80 million RMB in 1986 to 9.5 billion RMB in 2010.

## President Chen Yiyu Meets with Former NSF Director



NSFC President Chen Yiyu met with Dr. Arden L. Bement, former NSF Director on April 27, 2011. Prof. Chen extended his welcome to Dr. Bement and expressed his appreciation to Dr. Bement's positive contributions to China-US collaboration in basic research. He also introduced NSFC's recent development. During the meeting, the two sides exchanged views on such topics as climate change, water and energy challenges, and discussed the perspective of collaboration in these fields.

Dr. Bement served for six and half years as the NSF Director till June 2010 and he is now the Director of the Institute of Global Policy Research of Purdue University. Dr. Bement was accompanied by Dr. Michael Brzezinski, Director of International Department of Purdue University. Among NSFC participants in the meeting were Prof. Ji Peiwen, Chang Qing, Che Chengwei, Chen Huai.

## President Chen Yiyu Meets with RFBR President



NSFC President Chen Yiyu met with President Vladislav Ya. Panchenko, RFBR (Russia Foundation for Basic Research) on June 2, 2011. The two sides expressed mutual satisfaction with the bilateral cooperation and exchanged views on how to further promote substantial collaboration. Discussions were also carried out in jointly support research in areas of climate change and material science.

NSFC and RFBR have been supporting exchange visit and bilateral workshop through joint call since 1997. The two sides are now actively exploring the possibility of joint funding in substantial research. Members of the RFBR delegation also included Dr. Alexander Sharov, the Director General of International Department of RFBR and Ms. Svetlana Astakhova, Program Manager of RFBR. NSFC staff from the Department of Material and Engineering Sciences, the Department of Information Sciences and Bureau of International Cooperation attended the meeting.

## President Chen Yiyu Visits Greece, Spain and Germany



*Prof. Chen Yiyu, President of NSFC, led a delegation to visit Greece, Spain and Germany from May 21 to June 1, 2011.*

During his visit in Greece, Prof. Chen met with Anna Diamantopoulou, the Minister of Education in charge of science and technology affairs. Prof. Chen introduced China's science and technology structure and the important role of NSFC in the system. The Minister expressed great interest in collaboration with China in science and technology. Both sides agreed to actively promote Sino-Greece collaboration in science and technology and hope to sign the NSFC-GSRT bilateral cooperation agreement during the Minister's upcoming visit to China in July, 2011. At the Minister's invitation, the delegation attended the General Assembly of the Directors of Greek Research and Technology Centers and gave a comprehensive introduction about NSFC. The delegation also visited the National Hellenic Research Foundation and the National Centre for Scientific Research (Demokritos), where they learned Greece's latest progress in science and technology.

In Spain, Prof. Chen Yiyu met with Prof. E. Bouboukas, Vice President of the Spanish National Research Council (CSIC) and discussed future substantial cooperation. They agreed to organize bilateral workshops in water resources and plant molecular biology, and meanwhile explore the opportunities to fund the substantial

joint research projects by scientists from the two countries. The two sides also agreed to sign a new Memorandum of Understanding to provide guidance for future funding activities. The delegation visited the subordinate institutes of CSIC such as National Museum of Natural Science, Royal Botanical Gardens, National Institute of Microelectronic, Institute of Environmental Diagnose and Water Research and Institute of Earth Sciences Jaume Almera.

In Germany, Prof. Chen met with Prof. Matthias Kleiner, President of DFG. Both sides exchanged their latest progress and discussed the ongoing Sino-German-Finnish Joint Call on immunology and other relevant issues concerning Sino-German Center and Sino-German interdisciplinary cooperation and research projects.

Members of the delegation include officials from NSFC Bureau of International Cooperation, Department of Earth Sciences, and Department of Engineering Material Sciences.

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## **The 4th Plenary Session of the 6th NSFC General Assembly Held in Beijing**

The 4th Plenary Session of the 6th NSFC General Assembly was held in Beijing on March 23rd, 2011.

At the opening ceremony, NSFC President Chen Yiyu delivered NSFC's Work Report entitled "Keep Opening up New Prospect for the Development of the Science Fund by Highlighting Strategic Orientation and Creating Environment for Innovation". NSFC Vice President Sun Jiaguang delivered the "Report on Formulating the Twelfth Five-Year Plan for the National Natural Science Foundation". Professor Zhu Daoben, Chairman of NSFC Supervision Committee, delivered the Work Report of NSFC Supervision Committee. Mr. Qi Chenyuan, Director-General of the Department of High-tech Industry of the National Development and Reform Commission, and Mr. Zhao Lu, Director-General of the Department of Education, Science and Culture of the Ministry of Finance gave speeches respectively. Members of General Assembly and Supervision Committee attended the meeting. Participants of the meeting also included representatives from State Council Legislative Affairs Office, State Council Research Office, Ministry of Education, Ministry of Science and Technology, Ministry of Human Resources and Social Security, National Audit Office, Chinese Academy of Science, Chinese Academy of Engineering, and China Association for Science and Technology. NSFC Vice President Wang Jie chaired the opening ceremony.

The Plenary Meeting examined and approved by voting all work reports and the "Twelfth Five-year Plan for The National Natural Science Foundation of China. President Chen, Vice Presidents Wang Jie, Shen Wenqing, Sun Jiaguang, Shen Yan, Yao Jiannian, He Minghong, Deputy Secretary General and Director-General of General Office Gao Ruiping attended the meeting and participated in group discussions. President Chen delivered the concluding report at the closing meeting chaired by Vice President Shen Wenqing.



## The 15th Meeting of China-Korea Joint Committee for Basic Scientific Research held in Busan



The 15th Meeting of the China-Korea Joint Committee for Basic Scientific Research was successfully held in Busan, Korea on June 16, 2011. 33 bilateral cooperative projects were selected by the Committee for FY 2011, including 21 joint research projects and 12 joint seminars. The Committee members made in-depth discussions on the issues of strengthening future cooperation and topics for the Northeastern Asian Symposium.

Delegations from both sides were respectively headed by Prof. Shen Yan, Vice President of NSFC, and Prof. Se-Jung Oh, President of NRF. A total of 24 participants including members of the Joint Committee presented at the meeting. Korean delegation includes Korean members of the Joint Committee and staffs from the Center for International Affairs, NRF. The Chinese attendees include Prof. Lin Guoqiang, Director General of NSFC Department of Chemical Sciences and Co-Chairman of the Joint Committee, the Chinese members of the Joint Committee and staffs from Bureau of International cooperation, NSFC.

At the invitation by Busan National University, the members of the Joint Committee visited the Advanced Ship Engineering Research Center, the National Core Research Center for Hybrid Material Solution, the Institute of BioPysio Sensor Technology, and the Research Center for Dielectric and Advanced Matter Physics of Busan National University after the meeting.

## Vice President Shen Wenqing Visits U.S. and Canada



NSFC Vice President Shen Wenqing led an NSFC Mathematical and Physical Sciences Delegation and paid visits to the U.S. and Canada during June 1-10, 2011.

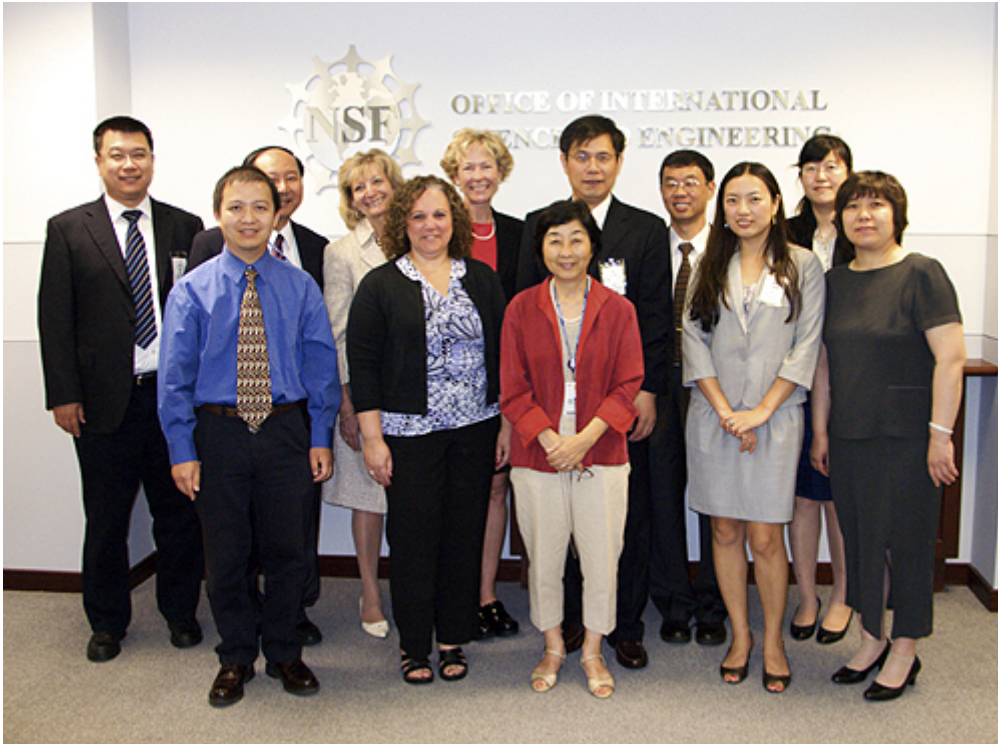
During the stay in the U.S., the delegation visited the U.S. National Science Foundation (NSF) and the U.S. Department of Energy (DOE) respectively, with aim to exchange views on possible mechanisms for enhancing future bilateral cooperation in mutually interested fields such as mathematical sciences, astronomy and high energy physics, etc. Ms. Machi Dilworth, Head of NSF Office of International Science and Engineering (OISE), and Dr. Celeste M. Rohlfling, Deputy Assistant Director of NSF Directorate for Mathematical and Physical Sciences (MPS) met with the delegation. Participants in the meeting also include 9 MPS division directors and program directors. Both sides presented a brief wrap-up of the experience and achievements in recent bilateral cooperation in jointly funding collaborative research projects in the fields of mathematical sciences, physical sciences, astronomy, chemical sciences and materials sciences, and shared ideas in furtherance of future substantial collaboration in those areas.

During the visit to DOE, the delegation met with Dr. William Brinkman, Director of DOE Office of Science, and Dr. Tim Hallman, Associate Director DOE Office of Nuclear Physics and shared with each other the latest development of both agencies, including new strategies for development, annual budget, priority funding areas, etc. Agreement was also reached between both sides to establish formal partnership between NSFC and DOE by signing a cooperation agreement in the future, which will facilitate the collaboration between U.S. and China based scientists in research areas of common interest. The meeting between the NSFC delegation and DOE representatives marks a positive progress in broadening the channel of cooperation between DOE and NSFC.

The delegation also paid visits to several research institutions including the Brookhaven National Laboratory (BNL), the National Observatory in Big Island, Hawaii, and TRIUMF, Canada's National Laboratory for Particle and Nuclear Physics, in order to get first hand information of the latest advancements in relevant research fields.

Other delegates are Mr. Ji Peiwen, Mr. Zhang Shouzhu from NSFC's Dept. of Mathematical and Physical Sciences, and Mr. Zou Liyao, Mr. Wei Qin from the Bureau of International Cooperation.

## Vice President He Minghong Visits US and Canada



An NSFC delegation on science funding information management headed by NSFC Vice President He Minghong visited the U.S. and Canada during June 15-24, 2011.

Over the years, NSFC has established and maintained sound relationships with funding agencies in the U.S. and Canada, particularly in the domain of joint funding program and exchange of experiences in the funding management.

During its stay in the U.S., the delegation visited the National Science Foundation and the National Institutes of Health, learned about NSF's internet-based project management system, including the development and implementation of their information systems.

In Canada, the delegation visited the Fonds de la recherche en santé du Québec (FRSQ), the Canadian Institutes of Health (CIHR) and the University of Toronto. In its meeting with FRSQ, the delegation especially learned about FRSQ's project funding and management information system and discussed the future collaboration between the two agencies.

# NSFC Plays Key Role in Fundamental Research in Space Science Strategic Pioneer Program of CAS

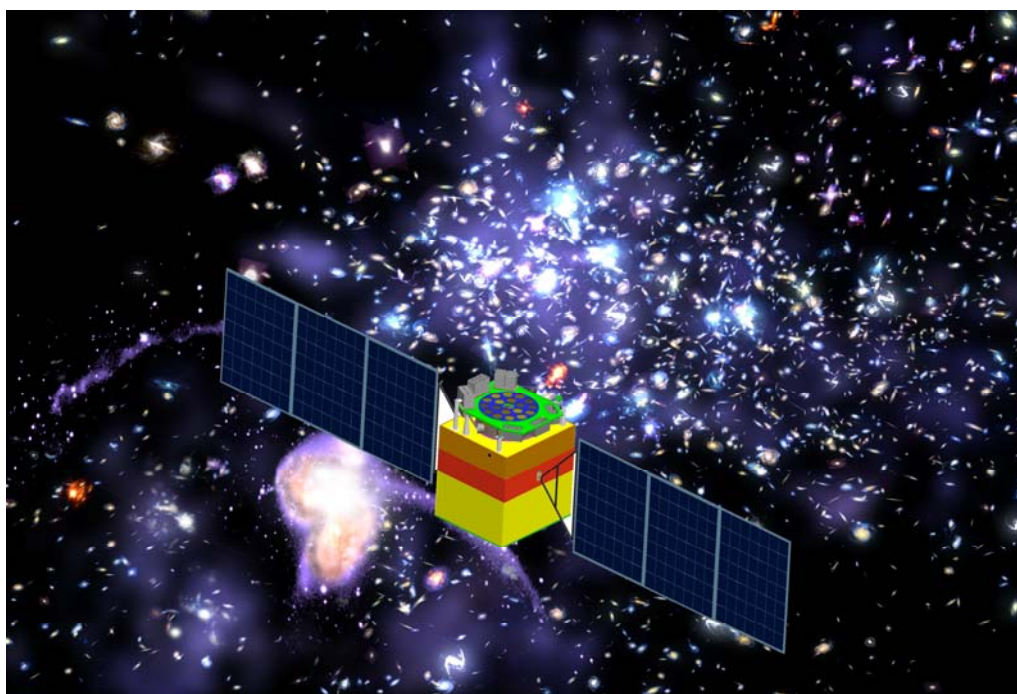
In January 2011, the Chinese Academy of Sciences initiated a series of Strategic Pioneer Programs in Science and Technology, of which Space Science Strategic Pioneer Program is one of the first to take off.

According to CAS, the fundamental research related to Space Science Strategic Pioneer Program in the “Twelfth Five-Year” period will focus on black hole properties, physical laws in extreme conditions, properties of dark matter, laws of matter motion and laws of life activities in space environment, and solar influence on the space weather, and verification of completeness of quantum mechanics. In the past, NSFC has given support to a number of projects in related research areas under taken by chief scientists in the Space Science Strategic Pioneer Program, and, in the future, NSFC will continue to provide high priority support for projects in the category of General Programs of NSFC as well as some projects in the category of Key Programs.

In the “Twelfth Five-Year” period, the following 7 projects will be conducted in Space Science Strategic Pioneer Program:

## **Project 1: Hard X-ray Modulation Telescope (HXMT)**

As China’s first space telescope, HXMT, operating in Low Earth Orbit, will scan the sky in 1-250 keV to detect X-ray sources such as X-ray binary systems and supermassive black holes, and conduct fixed point observations of X-ray emitting objects to measure their temporal and spectral behaviors. HXMT will help scientists understand the origin of cosmic X-ray background, the statistical properties of supermassive black holes, and the physical laws in extreme conditions such as strong gravitational and magnetic fields.

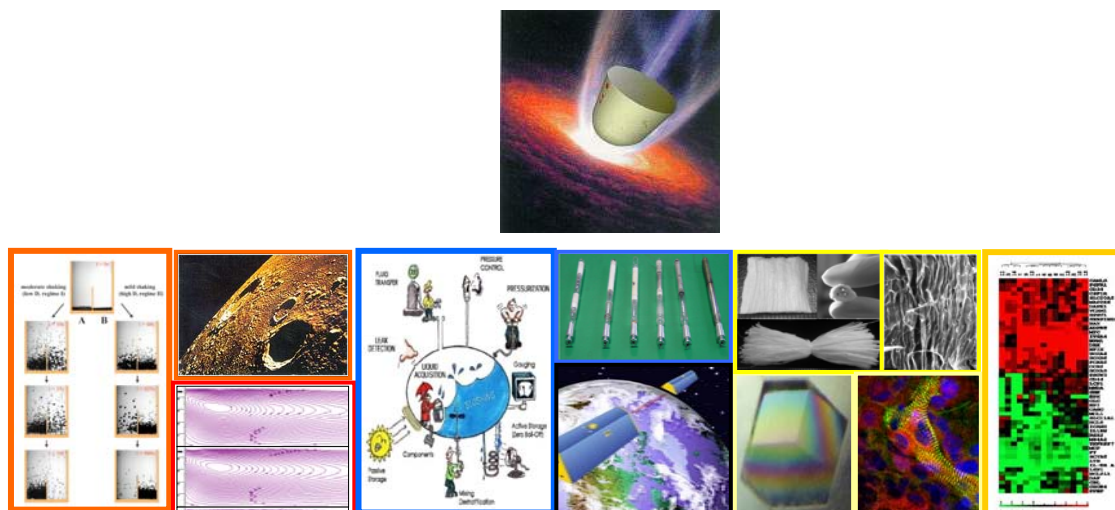


*Fig 1. An artist's view of the HXMT satellite*

## **Project 2: Shijian-10**

With developed recoverable satellite technology, SJ-10 focuses on the behavior of matter and life

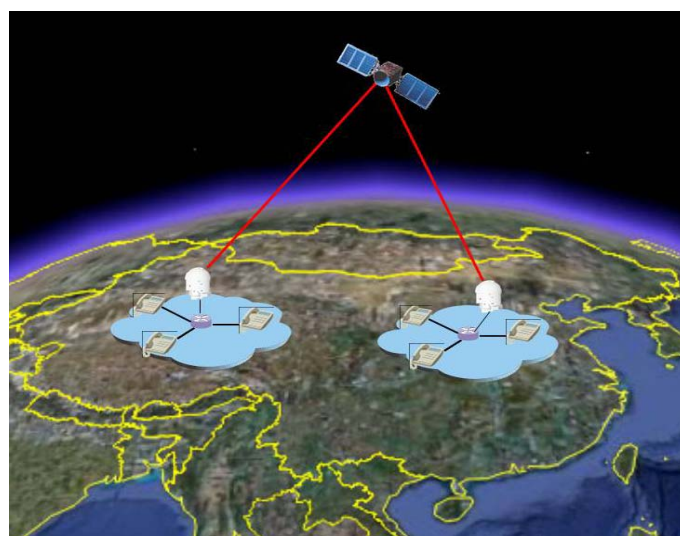
activities in space, it will carry out experimental research in microgravity on heat and mass transport in fluid, discrete system, bio-space adaptation, mutation and gene expression, etc., and will obtain major innovative achievement with intellectual property; Besides, it will conduct research on combustion in microgravity, space fluid management, space ecology, and other aspects of astronaut health study, discovering mechanisms regarding forecast of the component distribution of crude oil, fabrication of new materials, cultivation of new biological species, and improving technology on ground.



*Fig 2 Illustration of SJ-10 recoverable scientific-experiment satellite and the scientific experiments on board.*

### **Project 3: Quantum Science Satellite**

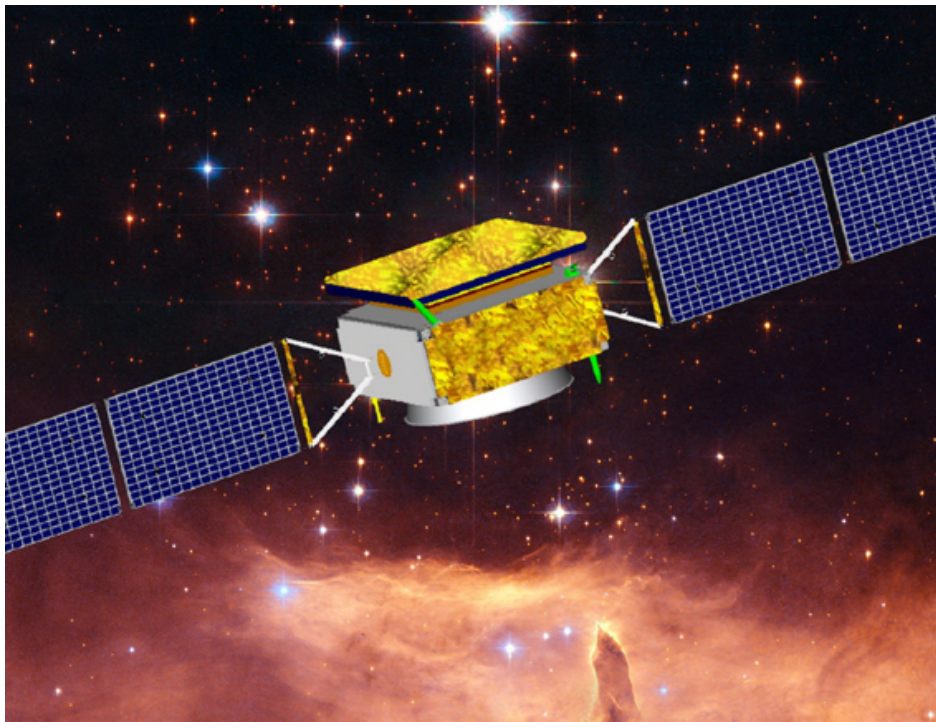
Quantum Science Satellite will conduct quantum key distribution for secure communication based on high precision acquiring, tracking and pointing system, establish the optical fiber quantum communication network by means of satellite transfer, conduct two-way quantum entanglement distribution for communications between satellite and ground stations in order to verify quantum mechanics non-locality, and then explore the feasibility of long distance quantum teleportation with multi-photon entanglement light source on ground.



*Fig 3. Illustration of Quantum Science Satellite*

#### **Project 4: Dark Matter Searcher (DMS)**

Dark Matter Searcher, a high energy electron and gamma-ray telescope with energy range from 5GeV to 10 TeV, will investigate dark matter particle from deep space by high resolution observation of gamma-rays and electrons spectra and its space distribution. It will help us study the transport and acceleration of the cosmic ray in the Galaxy by measuring the energy spectra of heavy ions. DMS aims at accurate and precise observation of the electron/gamma ray and the proton/atomic nucleus in a higher energy range. It will deepen our understanding of the universe.



*Fig 4. An artist's view of Dark Matter Searcher*

#### **Project 5: Kuafu Project**

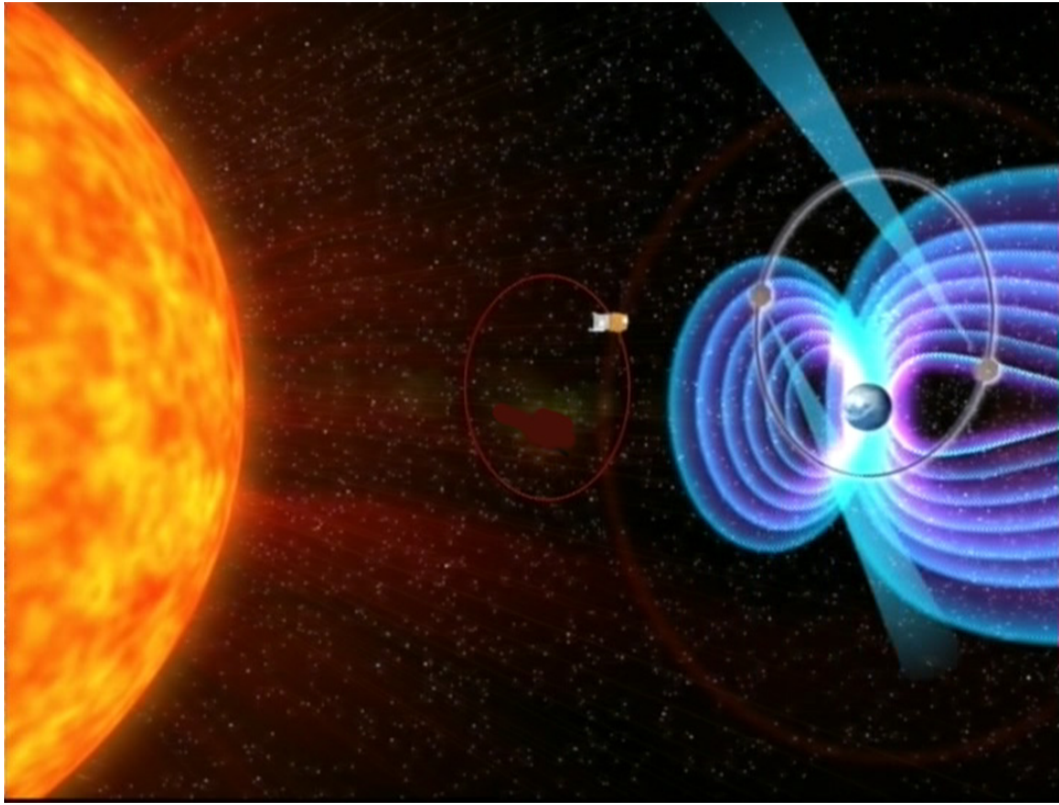
The legend goes that there is a god named KuaFu who was determined to have a race with the Sun and catch up with it, hereby comes the idiom, KuaFu chasing the Sun, which becomes the trope of man's determination against nature. And, as the name suggests, Kuafu project studies solar influences on the earth space weather. It is a cooperative project with Canadian Space Agency.

#### **Project 6: Study of New Space Science Missions**

According to space science strategic plan, this project aims at selecting appropriate new science missions, consolidating their scientific objectives, optimizing the exploration plans and developing key technologies, so as to make good preparation for implementing the mission in the Thirteenth Five-Year Plan.

#### **Project 7: Advanced Research of Space Science Missions and Payloads**

This project aims at advanced research on key technologies for future space science satellites through planning a cluster of research subjects, including new concepts of space science missions, key technologies of payloads, ground calibrations as well as short-time flight demonstrations.



*Fig 5. Illustration of the operation of Kuafu Project*