

CHINA SCIENCE AND TECHNOLOGY NEWSLETTER

Department of International Cooperation

No.04

Ministry of Science and Technology(MOST), P.R.China February 28 2017

[International Cooperation]

- **NKP Launches New Section of International Cooperation Projects**
- **9th Meeting of China-Chile Joint Committee on S&T Cooperation Held**
- **3rd Meeting of China-Thailand Joint Committee on S&T Cooperation Held**
- **Chinese Scientists Join 3rd IODP Expedition to South China Sea**

[Science and Technology]

- **On Innovation-driven Development in 2016**
- **China's Solar-powered Drones Make Progress**
- **Chinese Scientists Invent Technology of Cold Drill and Thermal Recovery for Flammable Ice**

[Activities]

- **Minister Wan Visits Research Station in Antarctica**

【International Cooperation】

NKP Launches New Section of International Cooperation Projects

The Ministry of Science and Technology held a press conference in Beijing on January 12th, 2017. Ye Dongbai, Director General of the Ministry's Department of International Cooperation introduced a

new section of projects on international scientific and technological cooperation under the National Key R&D Program (NKP).

Ye noted that the NKP has set up projects on inte-

Address: Room 1059, Office Building, 11 b, Fuxing Road, Beijing, China, 100038

Contact: Sun Lijie Email : hixiaosun@163.com

national scientific and technological exchanges and cooperation in major areas. The year 2016 witnessed the launch of the Intergovernmental Projects on Cooperation in Science, Technology and Innovation (STI) and this new section that encourages global institutional cooperation in science and technology. Not long ago, the call for proposal of the new section was officially released. The first call aims to implement the Plan on Promoting STI Cooperation under the Belt and Road Initiative. It focuses on three aspects based on cooperative R&D, namely joint R&D and demonstration, efforts to develop national-level bases and platforms for international S&T cooperation, and building a favorable international environment for scientific and technological innovation.

The overall objectives of the new section include six aspects. First is to support the "Belt and Road" initiative among other major initiatives and strategies, and enable STI to play a better guiding and supporting role. Second is to serve local departments' demands for

international cooperation, and do a better job in the pooling and sharing of innovation resources. Third is to strengthen all relevant bases and platforms for international S&T cooperation. Fourth is to create more mid-to-long-term opportunities for cooperative research, and further promote people-to-people exchanges and cooperation in science and technology. Fifth is to bolster STI cooperation to tackle global challenges together, and to fulfil the visions outlined in the UN's 2030 Agenda for Sustainable Development. Sixth is to encourage the in-depth engagement of businesses in international STI cooperation, and improve the international environment for innovation and entrepreneurship. To sum up, the overall philosophy is "adopting a global vision, seeking open cooperation, focusing on key areas, and enabling win-win outcomes".

(Source: Ministry of Science and Technology, January 13, 2017)

9th Meeting of China-Chile Joint Committee on S&T Cooperation Held

The 9th session of the China-Chile Joint Committee Meeting on Intergovernmental Cooperation in Science and Technology was successfully held in San Diego on January 17th, 2017. The Meeting was jointly presided over by Wan Gang, Minister of Science and Technology of China, and his Chilean counterpart Mario Hamuy, President of the National Commission for Scientific and Technological Research (CONICYT). The Meeting was attended by representatives from the Chinese Ministry of Science and Technology (MOST), the Ministry of Foreign Affairs of Chile, the CONICYT and other related departments.

Minister Wan identified the cooperation in science and technology as part and parcel of

China-Chile bilateral relations. The two countries have carried out fruitful exchanges and cooperation in astronomy, renewable energy, agricultural science and technology, and earthquake science and technology, etc. These productive collaborations contributed to socio-economic development and people's wellbeing in the two countries. Innovation is essential for the further development of China-Chile relations. Both sides should give full play to the role of the Joint Committee on Cooperation in Science and Technology; strengthen cooperation in relevant areas, promote the translation of scientific and technological achievements; and enable domestic industries to move higher up the global value chain to the benefit of the two peoples.

President Hamuy spoke highly of the bilateral

cooperation in science, technology and innovation. He said that the cooperation enjoys a solid foundation and broad prospects. The Chilean side is willing to have pragmatic cooperation with the Chinese side within the framework of the China-Chile action plan on science and technology. Chile welcomes China's proposal on developing joint laboratories; and hopes that in areas of common interest, both sides will work together on joint R&D and demonstration, and promote personnel mobility and cooperation.

Representatives have in-depth discussions about cooperation in Antarctic research, biotechnology, earthquakes and earthquake engineering, astronomical

observation, renewable energy, and joint laboratories among others. They also planned for bilateral cooperation in science and technology in the next three years.

After the meeting, the two sides signed the 2017-2019 Action Plan between the Ministry of Science and Technology of the People's Republic of China and the National Commission for Scientific and Technological Research of the Republic of Chile; as well as a memorandum of understanding (MOU) on joint laboratories.

(Source: Ministry of Science and Technology, January 20, 2017)

3rd Meeting of China-Thailand Joint Committee on S&T Cooperation Held

The third Meeting of the China-Thailand Joint Committee on Science and Technology Cooperation was held in Qingdao, China on January 17th, 2017. The Meeting was attended by a Chinese delegation led by Yin Hejun, Vice Minister of Science and Technology; and a Thai delegation led by Soranit Siltharm, Permanent Secretary of the Ministry of Science and Technology of Thailand. The two leaders signed the meeting minutes on behalf of the two ministries.

The Joint Committee listened to reports of five Joint Working Groups on the progress of cooperation in the China-Thailand Joint Research Center on Railway System; the Talented Young Scientist Program (TYSP); technology transfer; space technology applications; and policies on science, technology and innovation (STI). The Committee also discussed and adopted the 2017 Work Plan. Work Reports were submitted by the Joint Working Groups and incorporated into the meeting minutes with approval of the two Co-Chairs. In the same time, the Committee noted that Chinese Academy of Sciences

(CAS) and Thailand have conducted fruitful STI cooperation. In particular the Bangkok Innovation Center had been established by CAS and joint effort were being made to build the Joint Laboratory on Biology and Microbiology. It was planned that a joint working group would be set up to promote this cooperation.

According to Vice Minister Yin, in recent years China and Thailand have continued advancing key projects on science and technology cooperation, and proactively carried out people-to-people exchanges to fully tap the potential for further cooperation. Many achievements have been made. Efficient and sophisticated mechanisms are up and running. Thus China-Thailand cooperation has become a role model that helps and guides the development of science and technology relations between China and other ASEAN countries. It is of great significance to further cooperation in science, technology and innovation in the future in the interest of socio-economic development and the consolidation of friendly relations between the two countries.

Permanent Secretary Siltharm commented that through the platform of the Joint Committee Meeting (JCM), projects have obtained real accomplishments. The Thai Ministry of Science and Technology directs a lot of attention to the Work Plans of Joint Working Groups, and has formulated measures and corresponding activities to ensure smooth implementation of these Work Plans. Specifically, he noted that the China-ASEAN Science and Technology

Partnership Program (STEP) has played a very important role in the China-Thailand STI cooperation. This JCM is a small step forward, nevertheless the two countries are expected to make a big stride in bilateral scientific and technological cooperation.

(Source: Ministry of Science and Technology, January 23, 2017)

Chinese Scientists Join 3rd IODP Expedition to South China Sea

A team of 33 scientists from China, the United States, France, Italy, Norway, Japan, India and other countries embarked on the drilling ship JOIDES Resolution in Hong Kong on February 8th, 2017. They were heading for the South China Sea (SCS) to carry out the Expedition 367 of the International Ocean Discovery Program (IODP). It also marks the start of a third IODP exploration of the South China Sea joined by Chinese scientists. This drilling mission included Expeditions 367 and 368 participated by a total of 66 scientists from 13 countries for a duration of 4 months. It planned to select 4 drill sites to a depth of 3,000 to 4,000 meters in the northern area of the SCS and drill to depths up to over one thousand meters. The aim was to obtain basement rocks on the eve of the continental rupture, reveal causes for the forming of the SCS, test hypotheses for lithosphere thinning during continental breakup, and unveil how marginal basins grow.

Co-Chief Scientists of Expedition 367 were Sun Zhen, researcher of the South China Sea Institute of

Oceanology, Chinese Academy of Sciences; and Joann Stock, professor of the California Institute of Technology. Co-Chief Scientists of Expedition 368 were Jian Zhimin, professor of Tongji University; and Hans Christian Larsen, professor of the Geological Survey of Denmark and Greenland.

Initiated in 1968, the IODP is the one of world's major international cooperation programs on earth and ocean sciences, with the most extensive range of research, the longest duration, and the most profound impacts. It is an important scientific and technological platform that leads modern international deep-sea exploration. Scientists from all over the world present their own proposals to compete for drilling expeditions. China has played a major role in two previous expeditions to the South China Sea since joining the IODP in 1998.

(Source: Science and Technology Daily, February 9, 2017)

On Innovation-driven Development in 2016

The year 2016 marks a year of milestone importance in our history of science, technology and innovation. In that year, The CPC Central Committee and the State Council issued the Outline of Innovation-driven Development Strategy, and confirmed the “three-step” strategy. Moreover, the promulgation of the National Program for STI Development in the 13th Five-year Plan Period painted an ambitious blueprint of STI development in the next five years.

Progress has been made in basic research:

In quantum development, the world’s first quantum satellite Micius was successfully launched, which marks the establishment of a space-ground integrated system of quantum secure communication and scientific experiment. Our scientists realized quantum fingerprint over a 20km fiber for the first time, opening up greater space for quantum communications.

In terms of new material, the team led by Ma Yanwei from the Institute of Electrical Engineering of CAS has achieved progress in large-quantity graphene preparation and graphene-based supercapacitor, which made possible fast, green and low-cost preparation of graphene. The team led by Liu Jing from Technical Institute of Physics and Chemistry of CAS discovered that liquid metal can “run, jump and walk while loaded” for the first time, laying a foundation for developing flexible intelligent robots.

With regard to life sciences, the team led by Shi Yigong from Tsinghua University published long papers on Science and Nature, reporting on the molecular mechanism of the spliceosomes of brewer’s yeasts in the first and second splicing reactions and providing the clearest 3D structure of spliceosomes

under different working conditions. The research team led by Gao Fu from CAS aligned with the team led by Yan Ning from Tsinghua University to report for the first time the cryo-EM structure of NPC1 and surface fusion protein of the Ebola Virus, providing new ways to prevent and control the Ebola epidemic and promote antiviral drug R&D.

In terms of aerospace development, Shenzhou 11 and Tiangong 2 realized successful docking and rendezvous, and astronauts Jing Haipeng and Chen Dong created a new record of staying for 33 days in space, which have laid a solid foundation for the construction and operation of space stations. The successful launch of our new-generation carrier rocket with the largest thrust marked the upgrading of our carrier rockets which are up to world-class standards of carrying capacity.

The Five-hundred-meter Aperture Spherical Telescope, the world’s largest single-dish radio telescope could serve as a platform for exploring the origin of the universe. The homegrown Haidou ARV (autonomous and remotely operated vehicle) made a historically deep dive of 10,767m, enabling our country to do scientific research at 10,000 meters below sea level.

According to the supplementary issue of Nature published in last July, among the global top 100 research institutes with the greatest research output increase, 40 came from China. This makes China the number one country with the biggest number of institutions listed in the Nature Index 2016 Rising Stars tables.

Great progress has been made in technical innovation:

Enterprises worked hard on innovation, with core competitiveness enhanced constantly. Thanks to its leading core technologies, Huawei cellphone has witnessed its market growth of over 50%. The first flexible display product line invested by BOE Technology Group, a leading company in semiconductor display, will go into operation this year, making it the world's second company mastering flexible display technology and realizing mass production.

Regarding bio-medicine, a new drug called Conbercept developed by Yu Dechao's team raised its domestic market share to over 50% within a very short time, reducing the reliance on imported medicine of the same kind. A batch of innovative medicine against cancer, diabetes and hepatitis B have been put into clinical trial, which will enable Chinese patients to use more domestic new medicine with lower price and high quality.

The industrialization of new technologies like cloud computing, big data and 3D printing has been accelerated, while the new-generation IT has shown their strengths in circulation and medical care. In the first three quarters of last year, the contribution of the added value of high-tech manufacturing industry to industrial growth has exceeded 20%. By July last year, the number of invention patent grants in China increased by 49.5%, and the yearly total was estimated to top 500,000.

Major efforts have been made in reform and innovation of S&T system:

The regulations on implementing the law on transformation of scientific and technological achievements and the action plan on the translation and transfer of

S&T achievements have been implemented, red tape has been cut and the right to disposal and remuneration of research findings has been given to universities and research institutes, and researchers are entitled to "no less than 50%" instead of the former "no less than 20%" of benefits derived from commercialization, which greatly motivates researchers for innovation and entrepreneurship.

According to the Opinions on Improving Fund Management Policies of Central-budgeted S&T Projects issued in last July, the power of budget adjustment has been devolved. There is no limit on the sharing of service charge, which will make the allocation of S&T resources more scientific and efficient. Direct beneficiaries include postgraduates, post-doctors, visiting scholars and researchers and assistants employed for the projects.

According to the opinions on noting the value of knowledge in income distribution which were issued in last November, the income of researchers is expected to increase steadily through increased basic salaries, performance-based remuneration and income from the commercialization of R&D findings.

The scope of pre-tax deduction of corporate R&D cost has been broadened, the IPR has been better protected, and a larger number of researchers and college graduates have devoted themselves to innovation and entrepreneurship. Statistics have shown that in the first three quarters of 2016, there were 14,600 newly registered enterprises and over 40,000 newly registered market entities, which indicated the unprecedented enthusiasm for innovation and entrepreneurship.

(Source: People's Daily, January 9, 2017)

China's Solar-powered Drones Make Progress

The Rainbow series of solar-powered unmanned aerial vehicle (UAV) developed by China Academy of Aerospace Aerodynamics (CAAA) completed its test flight, and will be further tested in near space flights this year. As introduced by Shi Wen, chief engineer of CAAA, the drone with a wingspan of over 40 meters, is the world's largest of its kind after the US NASA

series, ranking among the international top 3 in terms of performance and technology. According to Shi Wen, his team has basically identified the key technologies of solar-powered AUV, and will research into more difficult parts in the future.

(Source: Xinhua News Agency, February 7, 2017)

Chinese Scientists Invent Technology of Cold Drill and Thermal Recovery for Flammable Ice

A research team from Jilin University invented the technology of cold drill and thermal recovery for terrestrial gas hydrate, which filled our gap in this area and won the Second Prize of the 2016 National Technology Invention Award. Natural gas hydrate, or flammable ice, generates a small amount of carbon dioxide and water as well as much less pollutants than coal, oil and natural gas, but ten times the energy that of coal, oil and natural gas. With a large reserve, flammable ice has been widely recognized by the international community as the substitute for oil and natural gas. Sun Youhong, Vice President of the university set up the team of over 30 professionals

dedicated to geology, geological engineering, thermology, bionics, chemistry and material. Thanks to constant research efforts for over ten years, the team developed the key technology of cold drill and thermal recovery with their own IPR, put forward the theory of "active freezing sampling" for the first time, invented the strengthened refrigeration method of drilling fluid, fast freeze sampling of hydrate, and hi-temperature pulse thermal activation, which filled our gap of drilling and production technologies of terrestrial gas hydrate.

(Source: Science & Technology Daily, January 20, 2017)

【Activities】

Minister Wan Visits Research Station in Antarctica

On January 18, Minister Wan Gang led a team to visit the Great Wall Station in Antarctica. Minister Wan paid a visit to the main office area of the Great Wall Station, exchanged views with researchers in the lab, learned the research progress, talked with experts

in related areas, and heard working reports. Minister Wan remarked that exploring the Antarctica represents an important part of S&T development of our country, and an essential part of China's efforts to explore the unknown world and engage in international

cooperation. As a pioneer in Antarctica exploration, the Station is of great significance to understand this region, and respond to climate change and environmental pollution. The Ministry of Science and Technology (MOST) gives great prominence to polar studies. During the 13th Five-year Plan period, MOST will continue to step up its support on polar research. He paid high tribute to the contributions of the resear-

chers to Antarctica exploration and S&T accomplishments, hoping that they will further their studies for greater progress of human civilization.

(Source: Ministry of Science and Technology, January 23, 2017)