CHINA SCIENCE AND TECHNOLOGY NEWSLETTER

Department of International Cooperation
Ministry of Science and Technology(MOST), P.R.China

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Headline News

China and France Sign Joint Statement on Innovation

On April 25, 2013, in the presence of Chinese President Xi Jinping and his visiting French counterpart Francois Holland, Wan Gang, Minister of Science and Technology of China, signed a joint statement on innovation with representatives from French Ministries of Industrial Renewal and of Higher Education and Research. According to the document, China and France will boost their collaborations in industry-and-research based innovation for win-win outcomes benefiting economic and social development of both, by way of deepening exchanges on innovation policy and establishing a mechanism of innovation cooperation.

On April 26, Minister Wan met with Geneviève FIORASO, French Minister of Higher Education and

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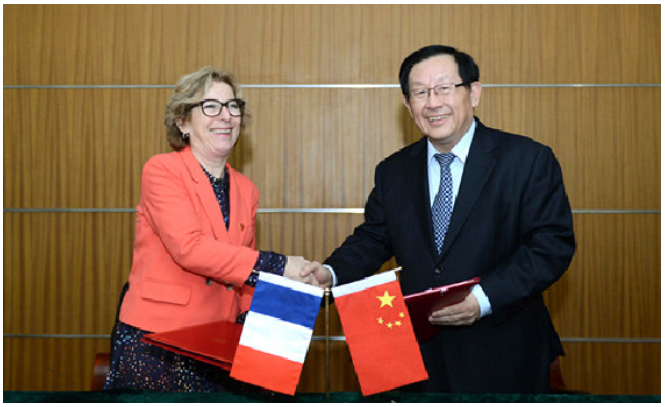
Research. The two ministers exchanged in-depth views on S&T innovation cooperation and also witnessed the signing of 3 cooperation agreements between Chinese and French research institutes.

(Source: MOST, April 28, 2013)



Minister Wan Gang Attends CEM-4

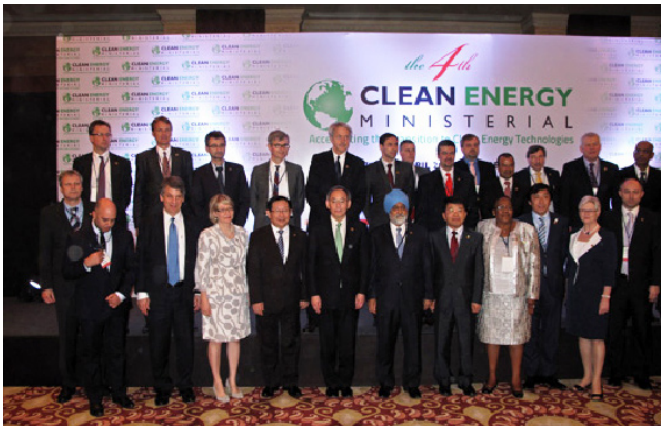
On April 17-18, 2013, the 4th Clean Energy Ministerial meeting (CEM-4) was held in New Dehli, India. The meeting saw ministers from 23 countries including China, the U.S., Brazil, Germany and Russia, and high-level representatives from the EU and IEA. The Chinese delegation was headed by Wan Gang, Minister of Science and Technology.

The meeting, based on the IEA Clean Energy Progress Report, reviewed the progress of the 13 CEM initiatives, and discussed how to improve energy efficiency, expand clean energy supply and deepen innovation collaboration in clean energy technologies through smart policies, programs and innovation strategies. Indian Prime Minister Manmohan Singh addressed the opening ceremony. UN Secretary-General Ban Ki-moon and the World Bank President Jim Yong Kim delivered video messages.

Minister Wan briefed the meeting on China's clean energy development plans, technology advances, and the progress of the 6 CEM initiatives China has joined, including Electric Vehicles Initiative (EVI), International Smart Grid Action Network (ISGAN), Carbon Capture, Use and Storage (CCUS) and Global Sustainable Cities Network (GSCN), etc. During the time, the public-private roundtables were also held and Minister Wan attended the "accelerating the global adoption of clean vehicles" session there.

The meeting also agreed upon next steps such as coordinating CEM initiatives, completing clean energy finance report, and setting up a high-level advisory group. The 5th CEM meeting will be hosted by South Korea next year. Since its inception in 2010, CEM has been aiming to accelerate the global deployment of clean energy technologies and boost international cooperation.

During his stay in India, Minister Wan met with Shri Sudini Jaipal Reddy, Indian Minister of Science and Technology and of Earth Sciences. They agreed upon cooperation on a number of topics, ranging from earthquake, climate change response, astronomical telescope to digital library. Minister Wan also paid a visit to Indian high-tech enterprises and universities.



(Source: MOST, April 28, 2013)

MOST Continues Relevant Work in Response to Human Infections of H7N9

Acting on the instructions by General Secretary Xi Jinping and Vice Premier Liu Yandong, the Ministry of Science and Technology (MOST) held another meeting recently to set out next steps for preparedness and control of human infections with H7N9 avian flu.

Since the national joint preparedness and control mechanism was in place, MOST has swiftly set up a S&T task force to map out an emergency response plan. A total of 30 million yuan has been earmarked by MOST for the research of emergency response to human infections with H7N9. MOST has worked closely with National Health and Family Planning Commission (NHFPC), China Food and Drug Administration(CFDA), Ministry of Agriculture(MOA,China) and State Forestry Administration(SFA,China) for facilitating vaccine R&D, test and registration. At the meeting, information sharing on clinical cases has been highlighted, and priorities have been identified, namely nucleic acid detection reagent and vaccine development, research of epidemiology and virus origin, clinical symptoms and treatment, and animal model study.

According to the meeting, MOST will continue to work together with relevant ministries and agencies, speed up actions in the above-mentioned areas and ensure the task objectives realized as earlier as possible. Therefore,a strong scientific and technological support will be timely provided to effective control of H7N9 infection cases, the better treatment, and lowering mortality rate of critically ill patients.

(Source: MOST, May 2, 2013)

National Diode-Pumped Laser Engineering Technology Research Center Established

The National Diode-Pumped Laser Engineering Technology Research Center, jointly established by Beijing Guoke Shiji Laser Co.,Ltd. and the Academy of Opto-electronics, Chinese Academy of Sciences (CAS), came into operation in Beijing recently. The Center, based on the technological requirements in some key sci-tech areas and the demand of laser processing and advanced scientific equipment industries, will carry out the development of engineering technologies for solid state laser in its design, manufacturing and testing as well as development, and organize to study on, spread of, and commercialize the applied technologies of the laser.

(Source: MOST, April 26, 2013)

China's Contribution to the World Agriculture in Sci-tech Progress

An article, titled*"Chinese Agriculture: An Experiment for the World"*, was published in Nature magazine early this May.The co-authors, Professor Zhang Fusuo and Chen Xinping from China Agricultural University and Professor Peter. Vitousek from Stanford University, USA, introduced the progress and achievements that China has made to boost

crop yields since the beginning of the 21th century.

The Chinese government has markedly increased its input in agriculture science and technology over the past few years. The agricultural R&D expenditure tripled during 2002-2009, and the ratio of sci-tech investment to agricultural production value grew from 0.36 percent to 0.66 percent. During 2003-2011, the crop yields in China increased by 32 percent, higher than any other regions of the world, while the use of fertilizer and water resources for cultivation dropped dramatically, which means that China is "offering an extraordinary laboratory for the rest of the world", as reported in the article.

Since 2008, a modern agriculture technology system has been put up and gradually improved, involving 50 universities, 340 research institutes and local test stations, and 200 enterprises,with participation of over 2,000 scientists. The government has built 12,000 pilot fields and provided guidance on soil testing and fertilization to the farmers through national agricultural projects. It is pointed out in the article that the scale, quality and layout of the agricultural research in China and its strong will, to meet the challenges of food security and environmental issues, offer a valuable experience to both developing and developed countries. It will be addressed for our common goal to respond to the climate change, increase crop yields, conserve natural resources and reduce environmental damages.

(Source: Science & Technology Daily, May 4, 2013)

Scientific Research Progress and Achievements

"Jiaolong" Submersible Passes Expert Review

The expert review meeting for the deep-sea submersible *Jiaolong* was organized by *the Marine Technology Office of 863 Program* on April, 27, in Wuxi, Jiangsu province. The expert panel, headed by Academician Xu Guanhua, consisted of 15 members from Tsinghua University, Shanghai Jiaotong University, Chinese Society of Naval Architectures and Marine Engineerings and China National Offshore Oil Corporation.

The development of *Jiaolong*, a deep-sea exploration vessel, is a major project in the fields of advanced manufacturing and marine technology supported by the 863 Program. The tasks of the project have been accomplished by over 100 research institutes and enterprises with total investment of 350 million yuan, spending 10 years.

According to the expert panel, the *Jiaolong* submersible, in addition to its greatest depth range comparing with the same kind of submersibles in the world, enjoys the safety and reliability at its maximum working depth, excellent operability and high performance in acoustic communication, auto-control and deep-sea operation. The project has completed each task identified by MOST and the submersible meets all the requirements based on the evaluation objectives and technical specifications.

The successful developing and testing of *Jiaolong* submersible signifies China to become one of the leading countries for the design, construction and testing of manned deep-sea exploration vessels. After the review, the submersible will be transferred to the China Ocean Mineral Resources Research and Development Association for a five-year trial operation and scientific studies later.

(Source: MOST, May 3, 2013)

China's High-Speed-Rail Equipment Passes Verification Tests

CSR Zhuzhou Electric Locomotive Co., Ltd. announced recently that TQ-600 permanent magnet synchronous traction motor has passed its more-than-one-month rigorous tests for national-level verification, with all its performance indicators meeting the design requirements. The equipment, jointly developed by the company and Zhejiang University as a key China Railway High-speed (CRH) equipment supported by 863 Program, was the very first to passing national-level tests in China. In the beginning of 2014, the motor will be first installed in the 350km/h trains which are already in widely service, so as to make CRH trains more energy-efficient, safer and more comfortable.

After being equipped with the new motor, instead of 365kW-AC motor in use now, a high-speed train with 8-unit EMUs (electric multiple unit) can improve single motor power by 65 percent to reach 600kW, thus cutting the total number of motors from 24 to 13. The power density of a single TQ-600 motor is expected to be up by 31.5 percent, and weight down by 1/3. The total weight will be down by 3,165kg. With its world-class level, this means a lot for further energy saving and consumption reduction of CRH trains.

(Source: Science and Technology Daily, May 6, 2013)

China’s Ballast-Water-Management System Receives International Certificate

Sunrui Marine Environment Engineering Co.,Ltd. received an approval certificate for its ballast-water-treatment system from American coast guard on May 7, 2013,which means the ships installed with the ballast-water-management (BWM) system developed by company Sunrui are allowed to navigate, berth and discharge ballast water in American waters.

Sunrui started the research on BWM system in 2006. It has become one of the three largest manufacturers of BWM system in the world. Its system is the only one in the world that receives approval certificates from classification societies in Norway, UK, France and China.

(Source: Science and Technology Daily, May 9, 2013)

Sperm New Inheritance Contribution for Heredity Revealed in China

Chinese scientists, by using zebrafish as the model organism, have revealed that the DNA methylome of sperm, not oocytes, is inherited by offspring. This was discovered by a team led by Professor Liu Jiang from Beijing Institute of Genomics, Chinese Academy of Sciences(CAS). Their findings will assist scientists to discover the mystery of the process from a fertilized egg to the individual development, and the paper was published in leading international academic journal Cell as a cover story on May 9th.

The offspring of syngamy species inherits half of the nucleus DNA from both parents, therefore, the cells in one animal have the same DNA set, but little other information of DNA is known to the scientists.

The research group headed by Prof. Liu used high-flux sequencing to map out the single base DNA methylation pattern of different developmental stages of zebrafish, whose genome has 85% genetic similarity to human beings. The team generated 1,200G of data by studying the genome-wide methylation of DNA sequence

of the egg, sperm and early embryo of zebrafish. They found that the offspring embryo of inherits sperm DNA methylation pattern on a selective basis. Their study shows that besides DNA, sperm DNA methylome can also be inherited in zebrafish, and the inheriting sperm methylome can facilitate the embryogenesis.

Their study subverted the commonly accepted notion that early embryo development is only defined by oocyte, while sperm plays almost no roles during embryo development. This research will facilitate the development of stem cell studies and translational medicine, and even provide new ideas for some diseases treatment.

(Source: Science & Technology Daily, May 10, 2013)

International Scientific and Technological Cooperation

Mid-term Evaluation of UNEP-MOST Africa Water Action

The Department of International Cooperation (DIC) of MOST and UNEP-Regional Office for Africa jointly held a mid-term evaluation for UNEP-MOST Africa Water Action on March 25-26, 2013. DDG Chen Linhao of DIC and Dr. Desta Mebratu, Deputy Director of UNEP Regional Office for Africa addressed the meeting. 17 Chinese organizations and 15 partners from 11 African countries attended the meeting and related activities.

DDG Chen briefed the audience on the background, objective and implementation of the water action. He paid tribute to the contributions of UNEP in facilitating African partners. Chen hoped the Chinese contractors could strengthen coordination with African partners, share experience and plan the next-stage cooperation to ensure completion of the pre-set targets. Dr. Desta Mebratu recognized the mechanism of trilateral collaboration in helping Africa address climate change and water crisis. Being grateful to MOST and Chinese contractors, he looked forward to extending Chinese applicable technologies to more African countries.

The contractors reported and evaluated the progress of the project and discussed the plan for the next step.

After the meeting, the foreign delegates made field visits to Huining and Dingxi in Gansu, inspecting demo projects of rainwater harvesting, comprehensive river basin management and ecological protection, drought-resistant crops, and Jingtaichuan Pumping Irrigation District. They also exchanged ideas with Gansu Research Institute for Water Conservancy, Lanzhou University and Gansu Desert Control Research Institute. Impressed by the Chinese technologies, the foreign guests hoped to bring Chinese applicable technologies, model and experience of S&T development to more African countries, helping realize sustainable development in Africa.

(Source: Department of International Cooperation, MOST, April 11, 2013)

Chinese and Canadian Scholars Discover AF Regulator miR-26

According to information from Harbin Medical University, Chinese and Canadian scholars jointly discovered miR-26, a small nucleotide that could regulate atrial fibrillation (AF). According to their paper published on the *Journal of Clinical Investigation*, miR-26 could regulate cardiac excitability. This study lays theoretical foundation for prevention and treatment of AF.

AF is one of the most common arrhythmogeneses. Its occurrence rate is 0.4 percent and 9 percent among the aged more than 80. AF could lead to thromboembolism, stroke and heart failure, increasing mortality rate. For the treatment of the global challenge AF, the discovery of new targets has always been the focus of study.

According to the joint study, reduction of miR-26 could generate a series of electrical disturbances in cardiomyocytes and induce serious AF. It is also found that nuclear transcription factor of activated T-cells (NFAT) are very important for induced gene transcription in immunity reaction. The increase of NFAT expression could downregulate miR-26 in AF.

(Source: Science and Technology Daily, May 7, 2013)

Cooperation Projects and Channels

International Cooperation Base (12): Sichuan Natural Resources Science Academy

Founded in 1978, Sichuan Natural Resources Science Academy (SCNRSA) has registered capital of 1 million yuan and 120 staff, 87 of whom are researchers. SCNRSA is the only research institute in southwest China that is dedicated to surveying of natural resources, land planning and regional comprehensive development, as well as management of natural resources. SCNRSA has a kiwifruit research institute and Shifang International Cooperation Base for Kiwifruit. With strong technical capacity, SCNRSA undertakes quite a few provincial research projects and international cooperation projects on kiwifruit resources and breeding. SCNRSA has long-term collaboration with Royal Society of New Zealand, respectively introducing technologies on evaluation, hybrid breeding, standardized planting and post-harvest treatment as well as several varieties of kiwifruit to Sichuan province. SCNRSA also obtains the proprietary IP of several new varieties of kiwifruit. Being active in international cooperation, the academy receives more than 40 foreign experts annually. *The Study on Collection, Conservation, Breeding and Commercialization of Kiwifruit Resources* by the research group in SCNRSA was awarded the first Prize of Sichuan Provincial S&T Progress Award in 2008.

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International Training Workshop on Application and Optimization of Methane Production

July, 2013

Lanzhou, China

Working Language: English

Objectives:

The aim is to help the participants to master application and optimization technology of methane production under suboptimal condition; to learn the latest related research results in the world; to carry out scientific research and technological application of methane production under suboptimal condition in line with local conditions.

Organizer:

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International Training Workshop on Wind and Solar Power Application Technology Based on Climate Change

July, 2013

Hohhot, China

Working Language: English, Russian and Mongolian

Objectives:

The aim is to help the participants gain new knowledge of renewable energy; to improve the participants' level of wind and solar energy application and engineering design; to achieve bilateral and multilateral S & T cooperation and exchanges.

Organizer:

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