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INTERNATIONAL COOPERATION

Innovation Forum Celebrating China-UK S&T Cooperation



An international innovation forum, co-sponsored by the Chinese Ministry of Science and Technology and the British Embassy in Beijing, opened on March 30, 2009, to celebrate the 30th anniversary of an S&T cooperation agreement being signed between the Chinese and British government. Some 200 representatives from Chinese and British government, research institutes, universities, and industry attended the forum, where a range of issues concerning agriculture, water resources, climate change, space technology, infectious diseases, and innovation policies were discussed.

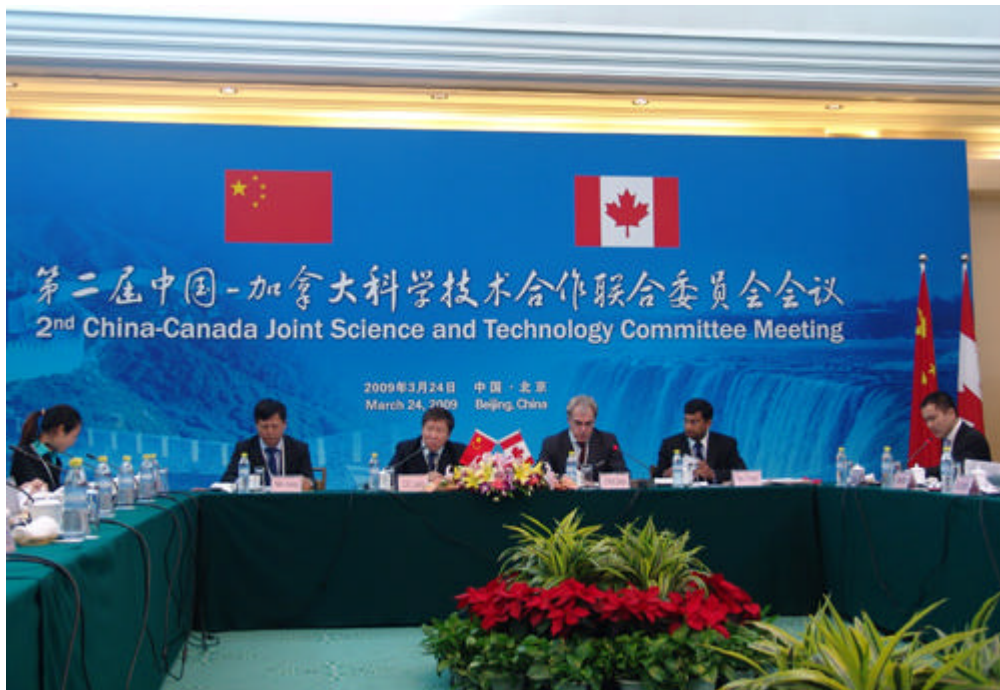
LI Xueyong, Chinese Vice-Minister of Science and Technology made his speech at the forum. He said that S&T cooperation between China and the UK in the last 30 years has become an important bilateral activity in the area of science and innovation. In recent years, the implementation of an array of major cooperation projects, including innovation, Science Bridge, and new energy/renewable energy, has allowed both countries to work together more on innovations.

A British delegation, headed by Prof John Beddington GCSA, attended the celebration event. Prof John Beddington said in his speech that the international community is facing more and more difficult problems, which makes international cooperation more important. He added that we are now in an economic crisis, in addition to a range of other issues, including climate change, water resources, food safety, and infectious diseases. In this context, it is very important for both countries to engage more in innovations.

Sir William Ehrman, British Ambassador to China, said at the forum that both China and the UK have witnessed huge changes in cooperation opportunities in the area of science and innovation since 1978. Today, both opportunities and demands are deepening the ties between the two countries in an unprecedented manner. Like China, the UK has paid great

attention to science and innovation, and is loyal to the partnership. The UK is willing to work together with China to achieve the science and innovation goals announced by the leaders of both countries in January 2008, namely China and the UK will build 100 new industrial R&D partnerships in the coming 5 years, and the scientific papers coauthored by Chinese and British scientists will be doubled in number.

## 2nd China-Canada S&T Meeting



The 2nd China-Canada Joint S&T Committee meeting was held on March 24, 2009 in Beijing. CAO Jianlin, Chinese Vice-Minister of Science and Technology and Pierre Coulombe, President of National Research Council of Canada co-chaired the meeting. Some 60 representative from China and Canada were present at the event. Both sides briefed the other the latest development of S&T policies and systems in their respective country. After reviewing the accomplishments that have been made since the last session, both sides discussed and reached consensus on the work plans for the five working groups in the coming two years, and other issues involving China-Canada S&T cooperation fund, commercial applications of S&T findings, collaborations between technology clusters, and exchanges of young scientists. The representatives from Heilongjiang, Shandong, Shanghai, Québec, Ontario have reported collaborations with their sister provinces.

After meeting, the Chinese Ministry of Science and Technology and Canada Institute of Health signed an MOU for kicking off a joint study in the area. The executive secretaries of both sides have exchanged the project lists that will be financed by the China-Canada S&T

cooperation fund in 2009. Co-sponsored by the Chinese Ministry of Science and Technology and National Research Council of Canada, a China-Canada S&T industrial forum was held on March 25, 2009 in Beijing. Both sides agreed that the next China-Canada Joint S&T Committee meeting will be held in June 2010 in Vancouver.

## China-Europe Clean Energy School

Benita Ferrero-Waldner, the European Commissioner for External Relations and European Neighborhood Policy, and GAO Hucheng, Chinese Vice-Minister of Commerce jointly inked on March 30, 2009 a financial agreement to create a Europe-China School of Clean and Renewable Energy. Jointly initiated by the European Commission and the Chinese government, the new school is designed to improve people's skills of implementing China's environmental policies, especially the one concerning renewable energy and energy efficiency. Meanwhile, the school will strive to establish long term contacts between European and Chinese scientists, experts, and academic institutions in the area of clean and renewable energy. The school also plans to provide professional education and training opportunity for Chinese women, ethnic groups, and poor people.

The European Commission will invest EUR 10 million in the project, and the Chinese Ministry of Education and Ministry of Commerce will be responsible for establishing the school. A number of European top academic institutions and one or more Chinese academic institutions will form up a non-profit conglomerate to run the school. The new school will have an annual enrollment of some 100 students.

## Traditional Medicine Regulates Stem Cell Division

Shuguang Hospital, part of Shanghai University of Traditional Chinese Medicine, recently inked a cooperation agreement with the Stem Cell Lab under King's College London, to study the active TCM constituents that can regulate the division of stem cells and use the mechanism to treat diseases. In the phase I cooperation, the Institute of Liver Diseases under Shuguang Hospital will screen out TCM constituent candidates based on earlier research findings and literatures, and make them available to the British Lab, where morphological and functional changes of embryonic stem cells treated with the constituents will be observed, in an attempt to further screen out valid constituents. During the three-year collaborative research, both sides will closely work on the needed technologies and resources.

According to a briefing, Shuguang Hospital is currently working on repairing and reconstructing the damaged liver tissues in patients with chronic liver diseases using the combined bone marrow stem cells and traditional Chinese medicine. Unlike the in-vitro stem cells production method employed by the UK Lab, the Chinese lab has achieved some progresses in studying the migration of bone marrow stem cells to and associated divisions

in livers, through duplicating the marker bone marrow stem cells in an animal hepatocirrhosis model. Preliminary results show that traditional Chinese medicine is able to affect the division of bone marrow stem cells in the livers of patients with hepatocirrhosis.

## RESEARCH AND DEVELOPMENT

### Heavy Ion Cancer Therapy

In 2008, a deep cancer treatment terminal was established at CAS Institute of Modern Physics to use the heavy ions provided by HIRFL-CSR storage ring. The terminal has so far completed beam tests and the first round of cell and animal experiments. As a result, clinical trials of deep cancer treatment were kicked off recently. As of April 3, 2009, a number of cancer patients have received the therapy after signing a volunteer document at the Institute's heavy ion cancer treatment center in Gansu Province. Unlike the shallow treatment (less than 2.5cm in depth) performed previously, the new clinical trials will mainly work on the therapy with a depth larger than 2.5cm. Comparing with traditional radiotherapies, heavy ion therapy enjoys numerous merits, including reduced damage to healthy tissues, shortened treatment cycle, and enhanced cure rate.

### New Approach for Structural Analysis of Ionic Liquid

A research team, led by Xu Hongjie and Wu Guozhong, with Shanghai Institute of Applied Physics (SINAP), Chinese Academy of Sciences, has investigated the components and structures of ionic liquid  $\text{ChCl-ZnCl}_2$  in different  $\text{ChCl:ZnCl}_2$  ratios using X-ray absorption fine structure spectroscopy (XAFS), through more than 2-year attempts in Japan (KEK), Beijing (BSRF), and Hefei (NSRL). Researchers measured the K side of zinc in the ionic liquid made up of  $\text{ZnCl}_2$  and  $\text{ChCl}$  using XAFS, and obtained detailed information on the internal structures of ionic liquid, based on which a molecule arrangement structure was proposed for different  $\text{ChCl:ZnCl}_2$  ratios. Researchers also believed that  $\text{ZnCl}_2$  is able to exist in the form of  $\text{Cl-Zn-Cl}$  in the ionic liquid, indicating the importance of synchrotron radiation in studying ionic liquid structures. The finding was published in a recent issue of journal *Physical Chemistry*.

### World's First Deep-Ultraviolet Light Source Device

Not long ago, CAS Technical Institute of Physics and Chemistry rolled out a prototype device that has become the first nanosecond deep-ultraviolet light source in the world. The R&D effort, a national key project initiated in 2007, has maintained the position of the

Chinese Academy of Sciences as a world leader in nonlinear optical crystals and laser technology, by producing 7 proprietary deep-ultraviolet light source devices. The development will eventually facilitate innovations in other areas, including physics, chemistry, material, information, life science, resources, and environment.

Thanks to one and a half year effort, researchers of CAS Technical Institute of Physics and Chemistry have developed an ns pulse deep-ultraviolet light source at 177.3nm, the first of its kind in the world. The laser device has achieved a major breakthrough with a raised output power that is 20 times the one developed in 2006, or 4 mW for a stable output power and 34.7 mW for the maximum, through optimizing the frequency – doubling system and using advanced KBBF technology.

## Key Materials for Wind Turbine Vane

CAS Changchun Institute of Applied Chemistry, in collaboration with Changzhou Tiancheng New Materials and Sichuan University, has recently worked out the key technologies for preparing a new material called Strucell, by combining a range of relevant technologies and techniques. The proprietary technologies have passed the GL accreditation.

To speed up commercial applications of the findings, the collaborators have established in 2008 an industrialization center in Changzhou with an annual capacity of 50,000 cubic meters of skeleton materials for building megawatt wind turbine vanes, the first of its kind in the country.

NEWS BRIEFS

## Sustainable Development Projects

Langfang was approved on February 2008 to be the first national experimental zone for sustainable development in the Hebei Province. S&T pilot projects makes an important part of the experimental zone. The first three pilot projects built in the experimental zone has achieved noticeable results.

A pilot project working on energy efficient building materials has diffused the proven technologies to 118 enterprises in an industrial park for thermal insulation materials, with a raised annual capacity by 150,000 tons, an increased annual output worth RMB 600 million, an enhanced electricity efficiency to 25%, and an annual cost saving worth RMB 26.2 million. The industrial upgrade has facilitated the realization of energy efficiency

targets.

Another pilot project designed to build new rural areas with S&T means has established 20 S&T model villages, and 5 S&T model townships. 299 S&T envoys have been dispatched to work at the frontline of agricultural production. Each demonstration site was equipped with 500 books on building new rural areas with S&T means, 400 training disks, and some TV sets, DVD players and touch screens. These villages have become the model villages for building new rural areas in Langfang.

A project created to demonstrate handling waste acids and associated resources utilization has reached a daily capacity of handling 200 tons of waste acids, recovering 120 tons of recycled acids, and extracting 20 tons of iron oxide red with a purity of 95% (for ceramics and brick making). The implementation of the project has effectively eased waste acid pollutions, turned wastes into useful resources, and facilitated the healthy and sustainable development of the steel industry in Bazhou.

## Massive Construction of Nuclear Power Stations

8 nuclear power generator contracts were signed on April 4, 2009 to start the civic construction of CPR1000 projects in Ningde, Yangjiang, and Fangchenggang among others. The development marks China's efforts to build nuclear power facilities in a massive manner. The contracts with an amount worth RMB 5 billion have covered No. 3 and No. 4 nuclear generators at the Ningde nuclear power station, Nos. 3, 4, 5, and 6 generators at the Yangjiang nuclear power station, and Nos. 1 and 2 generators at the Fangchenggang nuclear power station. These projects are part of the pressurized water reactors built with improved 2G technology, a prelude for the 3G technology (AP1000).

## Large Germplasm Bank for Tropical Plants

A germplasm bank containing 400 rare and precious tropical plant species in 35 families and 57 genera (170 of them are the species protected by the state) was recently established in Hainan. Thanks to the painstaking efforts of researchers at Chinese Academy of Tropical Agriculture, the germplasm of selected tropical plants have been bred and grown in a bacteria free environment, allowing long term conservations under controlled temperature, humidity, and sunshine. Researchers also established a database containing biological information, pictures, and management details of the plants.

In addition to protecting major tropical cash crops and rare/precious plants, the germplasm bank also provides a range of experimental materials and germplasm authentication services for research institutes.

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