N0.523

CHINA SCIENCE AND TECHNOLOGY

NEWSLETTER

The Ministry of Science and Technology
People's Republic of China

N0.523 **September 20,2008**

IN THIS ISSUE

SPECIAL ISSUE

More Biosolid Fuel

According to the major biomass energy objectives set up by China, by 2010 China will produce 5.5 million kilowatt hours of electricity generated from biomass energy a year, with bioliquid fuel reaching 2 million tons, biogas 19 billion cubic meters, and biosolid fuel 1 million tons. China s annual utilization of biomass energy has reached 1% of its energy consumption. The Chinese Ministry of Finance will provide a strong support for the sound development of biomass energy and associated industrialization, through four incentive policies, including loss subsidy, raw material subsidy, demonstration subsidy, and taxation holiday.

Meanwhile, the Ministry of Finance will stick to three principles in developing the biomass energy: 1) encourage to build the biomass energy base on unused land, rather than on croplands; 2)industrial development shall go along with financial incentives, in support of energy efficiency and S&T advancement; 3) and the steady development of biomass energy and associated industrialization, advocating for a healthy and orderly development and avoiding an overheated investment.

Additionally, the Ministry of Science and Technology has invested RMB 150 million to implement a biomass project for agriculture and forestry during the 11th Five-year Plan period (2006-2010), encouraging R&D activities in the area of biomass energy and chemistry, and providing technical support for the industrialization of biomass energy.

INTERNATIONAL COOPERATION

MOU Renewed between China and Canada

Not long ago, the Chinese Ministry of Science and Technology and National Research Council of Canada have renewed a Memorandum of Understanding on S&T cooperation for another four years. The renewed cooperation has made hydrogen fuel battery a priority for collaboration at the initial stage, leaving more room for defining other priorities when necessary. The renewed MOU proposes to establish a steering panel by both MOST and NRC, for defining cooperation areas, collaborating modalities, and the project to be supported on an annual basis.

Chinese Scientists Contribute to Large Hadron Collider

According to an MOU jointly inked by the Chinese government and CERN, the European Organization for Nuclear Research, China group (CAS Institute of High Energy Physics and Peking University) was assigned to develop two key components for the Large Hadron Collider in 1999. China group has completed the assigned mission, and installed the two components in the LHC.

While making the contribution to the LHC, Chinese scientists have made themselves ready for being part of the operation of the LHC, and associated physical modeling and dada analysis. Meanwhile, the systematic and in-depth studies made by Chinese theoretical physics community in the past 50 and odd years have played an important role in developing the needed components for the LHC. The Peking University Institute of Theoretical Physics has harvested an array of findings in addressing the issues closely associated with the experiment of LHC, such as the origin of mass of matter,

supersymmetry, and additional spatial and temporal dimension.

According to a briefing, the Chinese National Natural Science Foundation, Ministry of Science and Technology, and the Chinese Academy of Sciences have jointly financed the project with an amount of RMB 18 million, or 1% of the CMS costs, the first instance of a major international cooperation project being funded by the Chinese government.

Zero Emission Building in Ningbo

The University of Nottingham Ningbo inaugurated on September 20, 2008 the opening of the new building for the Sustainable Energy Technology Center, the first zero emission building in China. As a demonstration building showing the state-of-the-art technologies in the area of ecological energy efficiency and construction, the new building does not have a traditional heating and cooling system, but rather a new heating and cooling system operating on renewable energy. The tilting external windows have a reduced solar radiation with the help of air buffer layers, and an enhanced utilization of energy and renewable energy through a photovoltaic system. Meanwhile, the building is designed with a rainwater recycle system, allowing a self-supply of both electricity and water, and a zero emission. It is estimated that the building is able to reduce the emission of 1081.8 tons of carbon in the future 25 years.

The University of Nottingham Ningbo created the Sustainable Energy Technology Center in 2007, with a focus on renewable energy, environment friendly and energy efficiency building materials, and associated applications for residential and commercial buildings. In an MOU on sustainable development jointly signed by both China and the UK, it is agreed to build a research commonwealth to address the pressing needs of innovation in the area of sustainable development, the University of Nottingham Ningbo Sustainable Energy Technology Center is one of the research commonwealth members.

RESEARCH AND DEVELOPMENT

Chinese Made Key Component for LHC

The Large Hadron Collider, the world's largest atom smasher, was put into official operation on September 10, 2008 (Beijing Time). The core probe of LHC is made up of 6,000 crystal rods developed by Chinese scientists. The crystal tunnel is able to measure the magnitude of energy produced by different particles when passing through the tunnel in a coup d'oeil, identifying and detecting the new particles on the brink of disappearance.

Thanks to their 14-year painstaking efforts, CAS Shanghai Institute of Ceramics has made

two important world ś firsts in developing the large size PbWO4 crystal. The vertical Bridgman method, developed by Chinese researchers, allows a noticeably reduced cost for growing the Chinese made crystals. Researchers also found a new element that can be used to mix with the crystal for an enhanced performance. In assessing the crystal, a German scientist said it has the best resolution among the crystals so far he has tested. An American scientist believed that the crystals have excellent consistency and anti-radiation capability, with an illumination noticeably higher than the crystals made by the Russian counterparts. As a result, the European Organization for Nuclear Research asked China to supply more crystals, and provided 40 kg of platinum for making the mold. The crystals derived from the project have also been applied in a range of research institutes or projects, including Fermilab, Japan High Energy Accelerator Research Organization, and FAIR.

Advanced Pig Cloning Technology

In collaboration with a biotechnology firm in Beijing, a study team, led by Dr. LI Ning, a Chinese Academy of Engineering academician at China Agriculture University, has created a platform able to clone pigs using somatic cells, produce GM pigs, and perform gene knocking out, after 4-year painstaking efforts. The platform has so far cloned 28 pigs using somatic cells for diverse purposes, 16 pigs carrying human lysozyme genes, 1 pig re-cloned from the one carrying human lysozyme genes, and 4 pigs carrying MSTN. Some of them, including small sized pigs for medical experiment, the one carrying human lysozyme gene, and the one with MSTN, are the first of their kind in the world.

The sow carrying human lysozyme gene is able to produce the recombinant human lysozyme in the milk. The milk has been proved highly effective in raising the disease resistance and survival of piglets, as human lysozyme is of a strong killing effect on a range of pig-borne pathogenic bacteria, which makes breeding new pig species with strong disease resistance possible. MSTN is able to stimulate animals ’mussel growth. Cloning MSTN pigs will eventually lead to the reproduction of new pig species featured with more lean meat and an accelerated growth. The said findings will beef up the commercialization of pig cloning and associated genetic modification.

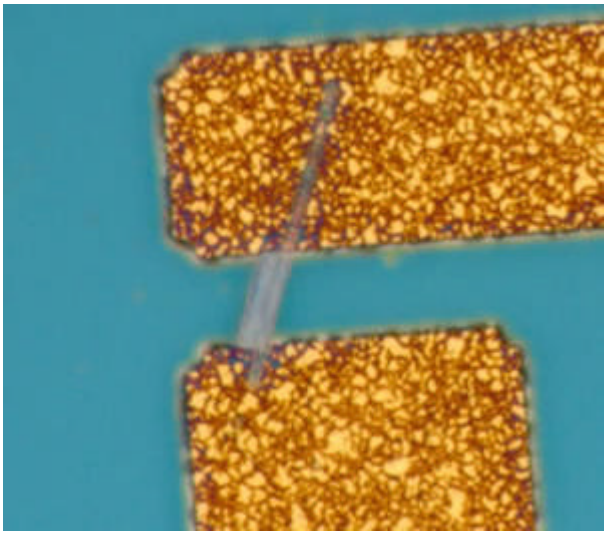
New Progress for Hybrid Rice

New progresses have been achieved in raising the yield of hybrid rice in the past five years, and the new generation super hybrid rice has raised the yield potential of rice to a higher level, said YUAN Longping, an academician of the Chinese Academy of Engineering at an international hybrid rice seminar held recently in Changsha. At the seminar, participants discussed a range of issues, including innovative approaches to breed new hybrid rice varieties, application of improved varieties and biotechnology, production of hybrid rice seeds, physiology of hybrid rice, high yield breeding and efficient resources utilization,

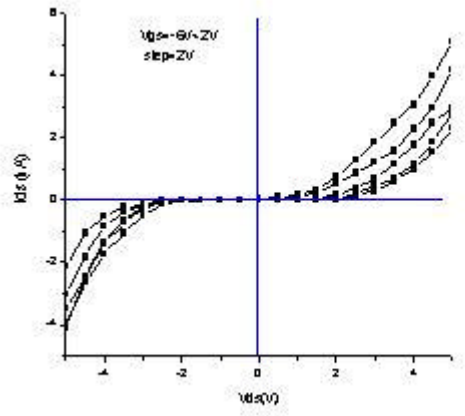
improvement of hybrid rice quality, hybrid rice economy, and strengthening the collaborations between research institutes and private sector. The discussion facilitates working out better strategies and approaches for hybrid rice research and production.

LIU Yanhua, Chinese Vice Minister of Science and Technology, said that the increasingly diffused application of hybrid rice technology has allowed some 20 countries in the world to study, import, and apply the technology. As a result, hybrid rice has played an important role in increasing the rice yield in the world, and in safeguarding food security. According to a briefing, the entire world has a hybrid rice growing area approaching 20 million hectares. The countries other than China have registered a growing area of hybrid rice from 820,000 hectares in 2002 to 2.13 million hectares in 2007.

China ś first transistor having ZnO nanorod effect



Innovative transistor



Test results

Not long ago, a study team, headed by ZHANG Haiying, a research fellow at the Chinese Academy of Sciences Institute of Microelectronics, has successfully developed the transistors having ZnO nanorod effects, the first of its kind in the country. Using the materials provided by the University of Science and Technology of China, researchers have worked out a brand new bottom-to-top approach to design and prepare the nanocomponents. With the help of traditional lithography technology, they rolled out a transistor using ZnO nanorods as the channel. The component has passed the required test, and become China's first transistor having ZnO nanorod effects.

NEWS BRIEFS

Advanced Ion Probe Center

Since its establishment in 2001, the Beijing Ion Probe Center, a state owned large scientific instrument center jointly financed by the Ministry of Science and Technology, Ministry of Land and Resources, and the Chinese Academy of Sciences, have allowed some 20 projects sponsored by the Ministry of Science and Technology, Ministry of Land and Resources, and National Natural Science Foundation, to share the resources at the Center. For example, the imported SHRIMP II has been working four hours a day and seven days a week, enjoying the highest efficiency among its counterparts in the world. With the help of the instrument, scientists, both at home and abroad, have harvested the findings with rich chronology data and high quality. For example, they measured the high resolution Uranium-Lead age through online remote control, and produced a result popular among their international counterparts. The Center has achieved some outstanding findings on the Precambrian geology, the evolution of fold belts in the middle Asia, and remote ion probe

sharing system. The Center has provided ion probe service for researchers all over the world.

MRI Center in Wuhan

Wuhan Magnetic Resonance Imaging Center, a large state owned scientific instrument center jointly built by the Ministry of Science and Technology, the Chinese Academy of Sciences, and Hubei provincial government, passed on September 11, 2008 an approval check organized by the MOST Dept. of Facilities and Financial Support. Expert panel attending the approval check believe that the core equipment of the center AVANCE III-800 has realized an optimized configuration, thanks to the 2-year tireless efforts of researchers at the CAS Wuhan Institute of Physics and Mathematics, and that an MRI sharing center is established. The Center has designed a rational and effective management mechanism to ensure the open and sharing operation of large scientific instruments. Since September of 2007, the core equipment has been running for 4000 hours, with a sharing rate reaching 47%, playing a support role in the area of MRI technology and methodology, metabonomics, and proteomics.

Submarine Operation at 4500m

China recently kicked off a national action plan for submarine operation at a depth of 4500m. 98% of the South China Sea has reached the 4500m marine depth. 95%—98% of the international waters enjoying sea floor cobalt-rich crust and thermofluid sulfides have also reached the depth. The development of deep sea shipping and operation facilities will allow China to work on most deep sea investigations in plan. The action plan has set up the objectives to develop a practical submarine vehicle and associated tools with strong operation capability for deploying a deep see observation network and associated maintenance, sea floor probe and sampling, and special submarine vehicles and creeping devices able to operate at a depth of 4500m.

Nankai-Baidu Joint Lab

A Nankai-Baidu Joint Lab was established on September 17, 2008 at the Nankai University. The lab, jointly built by Nankai University and Baidu Corp to work on information technology, is the first joint entity established by Baidu, in collaboration with a domestic university. According to the Lab director, the lab will focus on the activities in two areas: R&D and training. It will facilitate technology exchanges between Baidu and Nankai University through concrete projects, and enhance personnel exchange and training through the visits of researchers and students.

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