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SPECIAL ISSUES

S&T Development Strategy Institute Founded

A China Institute of S&T Development Strategy was established on December 28, 2007 in Beijing. WAN Gang, Chinese Minister of Science and Technology, is the Director of the Institute. The Institute will work on visionary, general, and comprehensive strategic issues that will lead to the establishment of an innovation country, and raising proprietary innovation capacity. Sticking to the principle of serving the nation, and serving S&T causes, the Institute will build itself into an internationally advanced research center able to support S&T related macro decision making process and management, be part of the top design of the nation's S&T

development strategies, undertake and organize major studies of strategic issues, provide S&T personnel training, and integrate strategic study resources in an open environment.

Top IT Inventions in the Year

Chinese Ministry of Information Industry announced on December 26, 2007 major IT inventions made in 2007. Top ten inventions, including key support technology for AVS coding standard developed by Chinese Academy of Sciences Institute of Computing Technology, and IGRS technology developed by Lenovo (Beijing), have been honored.

Other technologies honored for the year include the gallium arsenide IC developed by China Electronics Group No 55 Institute, multi-function broadband access platform technology and associated products by Huawei, WPS OFFICE 2005 by Kingsoft, TD—SCDMA fiber base station by Zhongxing Telecommunication, high end color printing control by Peking University and Beijing Founder Electronics, HTSC filter system by Tsinghua University and Zongyi Superconductor, SWS blood purification system by Chongqing Shanwaishan, and CM and GM 2-D bar coding technology by Wuhan CM S&T Corp.

INTERNATIONAL COOPERATION

China-Japan Climate Change Cooperation

The Chinese and Japanese government published on December 28, 2007 a joint statement to strengthen cooperation in the area of climate change. Both sides have reached the following consensus:

- 1) Further strengthen cooperation in the area of science and technology, making contribution to addressing climate change issues.
- 2) Address issues of common interest, in an attempt to ensure the regional sustainable development, and further promote S&T cooperation in the area of environmental protection and climate change. Strategic S&T cooperation projects can be conducted under the existing framework between S&T authorities of both nations.
- 3) Both sides will further strengthen the joint study of technologies for mitigating and adapting to climate change. Meanwhile, efforts will be made to promote collaborations in these areas, encouraging universities, research institutes, and industry to be part of the efforts.
- 4) Both sides will work on concrete cooperation projects, and adopt necessary measures to advance the projects.

- 5) As a link of East Asia Teenagers Exchange Program, each year Japanese side will invite 50 Chinese young scientists, including researchers in the area of climate change to visit Japan on a short time basis for 4 years, starting from 2008. Both sides encourage more exchanges of young scientists between the two nations.
- 6) To advance cooperation in the area of science and technology to a higher stage, both sides agreed to upgrade the level of chairperson of China-Japan intergovernmental joint S&T committee to a Vice-Minister level, allowing more participation of government departments. In the year where the joint committee is not held, information shall be exchanged on a regular basis, and cooperation enhanced.

RESEARCH AND DEVELOPMENT

China Made High Performance Computer



Demonstration of "KD-50-I"

In collaboration with Chinese Academy of Sciences Institute of Computing Technology, the Dept of Computer Science at the University of Science and Technology of China has rolled out a home made high performance computer (KD-50-I) able to perform 1 trillion floating-point operations per second, using the home made top Godson chip 2F. The home made supercomputer has integrated

some 330 Godson 2F chips in a single frame to perform 1 trillion floating-point operations per second. It can find applications in numerous economic sectors, including mathematics, physics, chemistry, geosciences, space science, life sciences, material science, dynamics, fire science, quantum science and informatics.

The event is a successful exploration, allowing high performance computer to serve personal needs, and making the home made processor the core of high end parallel system. It creates an innovation role model for developing home made petaflop computer in the future.

Quantum Factoring Algorithm Realized

Prof. PAN Jianwei, and his colleagues YANG Tao and LU Chaoyang at the University of Science and Technology of China, have for the first time in the world realized Shor's quantum factoring algorithm using photonic qubits. The research finding was published in *Physics Review Letters* on December 19, 2007.

The realization of Shor's quantum factoring algorithm on photonic qubits has long been an international puzzle. To compile a Shor's algorithm with quantum properties, researchers choose the simplest instance of this algorithm, and exploit a simplified linear optical network to coherently implement the quantum circuits of the modular exponential execution and semiclassical quantum Fourier transformation. Thanks to their painstaking efforts, and collaboration with researchers from Oxford University, genuine multiparticle entanglement is observed during this computation, which well supports its quantum nature. This experiment represents an essential step toward full realization of Shor's algorithm and scalable linear optics quantum computation.

Proprietary High Speed Locomotives

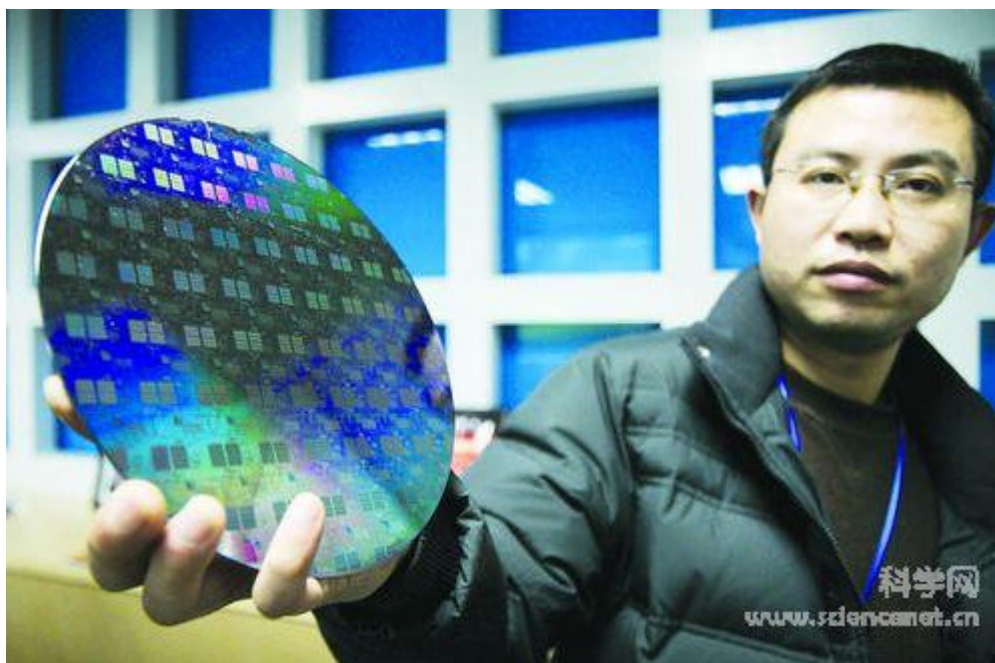
China's proprietary high speed locomotives (CRH2-300) able to run 300km an hour have been rolled off on December 22, 2007. Equipped with an array of the state-of-the-art technologies, including aluminum alloy body with a reduced weight, high speed turntable, high speed pantograph, and optic-fiber based integrated control system, the locomotive weighs 7 tons, reaching an internationally advanced level in the context of energy efficiency and environmental protection.

The train compartment is seats only. The wide and streamlined exterior allows excellent air dynamics. The compartment is designed with numerous comfortables, including advanced ventilation system, multimedia audio and video system, vacuum toilet, personalized catering service, and special toilet for the disables. The entire train is also equipped with a range of advanced devices for a comfortable and smooth run at a high speed.

The high speed train will be soon put into bulk production. The first trains will be

delivered in March 2008 for trial operations between Beijing and Tianjin, before coming into the official operation during the Beijing Olympic Game in 2008.

Proprietary Direct Write Lithography System



On December 25, 2007, China's first proprietary direct write lithography system rolled off in Hefei, indicating that China has broken up the monopoly of imported direct write lithography system at submicrometer level. In the picture, a researcher is displaying a finished product rolled out from the new system.

New Respiratory Tract Virus Discovered

A clinical research center, jointly established by Zhejiang Wenling No. 1 People's Hospital and a key biochips lab under Chinese Academy of Military Medical Sciences, has screened out a new respiratory tract virus (CLFF) from 278 infants' acute respiratory tract infection samples. Its sequence results have been archived on December 4, 2007 in Genbank.

Researchers say the finding makes another discovery, since they captured human bocavirus on July 2006 under the financing of National Natural Science Foundation. The research team is able to work out the accurate results of the virus within one hour.

Human Bird Flu Vaccine Phase II Succeeds

China's human bird flu vaccine team announced on December 24, 2007 that Phase

II clinical trials of human bird flu vaccine, jointly developed by Beijing Kexing Bioproducts and China CDC, has confirmed the safety of the vaccine in humans.

The results unveiled on December 22, 2007 shows that all 3 separate dosages of vaccines can induce human body to produce antibody to the viruses. Of them, the 18mg and 15mg dosages have produced all three indicators (positive antibody, positive antibody conversion rate, and GMT) up to the internationally accepted standard, indicating the fine immunity in humans. No serious side effects have been seen in people who are vaccinated.

Exercise Able Robot

A research team at Harbin Engineering University has recently developed an intelligent robot able to do exercise. With a height of 31cm, and weight 1.6 kg, the 'small potato' is able to perform a range of actions, including stretching, kneeling down, and turning. The 'small potato' has 16 motors for energy, and 16 free degree turntable structures, with a control board on the back. It receives command via a blue tooth device in which commands are pre saved for dancing and doing exercise.

The robot is able to do the popular "broadcast exercise", a set of stretch actions helping people to relax. It can do the exercise in a gradual manner, allowing every detail to be shown in action. As a good entertaining partner, it is also a helper for diffusing scientific knowledge. Unfortunately, it cannot leap, as it simply does not have sufficient moment.

GM Pig Conceived

On December 22, 2006, three pigs cloned with green fluorescent protein (GFP) were born at the Northeast Agriculture University, the fourth of its kind in the world following the United States, the Republic of Korea, and Japan. The three piglets were born in a natural manner, with an initial weight at 1270g, 1130, and 1230g respectively. Thanks to their cloned GFP traits, their mouth, foot, and tongue will show green fluorescent light under the ultraviolet illumination.

Up to date, the three cloned female pigs have grown to expected weight, and got conceived after coupling with male pigs. They are expected to deliver their babies in January 2008. Researchers are eager to know if their babies carry the same GFP traits, and will select the one having the GFP traits for further coupling.

NEWS BRIEFS

Power Plant Capture Carbon Dioxide

China's first carbon dioxide capture demonstration project for coal burning power plant was kicked off on December 26, 2007 at Huaneng Beijing Power Plant. Scheduled to be put into operation in 2008, the project is designed with a recovery of carbon dioxide above 85%, or 3000 tons of carbon dioxide a year. After separation and purification, the recovered carbon dioxide will reach a purity as high as 99.5%, sufficient for applications in food industry. After its completion, Huaneng Beijing Power Plant will become China's first coal burning power plant of environment friendly functions, including desulphurization, denitration, and carbon dioxide capture.

At the same time, a project to upgrade 4 boilers with advanced denitration technology in the same plant was completed on December 26, 2007. The upgrading will reduce the emission of nitrogen oxides from 400mg/m³ to 50mg/m³, reaching an internationally advanced level. Calculating on an annual capacity of 6000 hours, the project is able to reduce the emission of nitrogen oxides by 7000 tons a year, which will effectively improve the quality of atmospheric environment in Beijing, creating a fine environment for hosting the Beijing Olympic Game in 2008.

Navigation Chip for Mobiles

Institute of Microelectronics, part of the Chinese Academy of Sciences, announced on December 21, 2007 that it has developed China's first proprietary navigation chip for mobiles. With a name of Hangxin II, the chip is the baby derived from the joint efforts of Hangzhou Zhongke Microelectronics and CAS Institute of Microelectronics. The new chip enjoys numerous merits, including low power consumption and low cost, desirable for mobile phone based satellite navigation.

Advanced Mini Drill

A new hard alloy PCB long life mini drill production line, developed by Wuhan Jingtai using nanocrystal dislocation technology, was put into operation on December 28, 2007. Users' trial operation of some 10 million mini drills shows that the new mini drill works three times longer compared with regular mini drills, with a cost 2/3 of the imported one. The new production line is able to turn out 36 million PCB long life drills a year, which will produce a return worth RMB 300-500 million, taking up 5% - 8% of the world market share.

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