

N0.531

CHINA SCIENCE AND TECHNOLOGY

# NEWSLETTER

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

N0.531

December 10,2008

## IN THIS ISSUE

---

- \* More Scientific Papers from China
  - \* Lunar Peak: 9840m
  - \* China's First High Performance PC
  - \* New Findings on Heart Failure
  - \* China's AIDS Vaccine Safe and Effective
  - \* 8-inch SOI Wafer
- 

## SPECIAL ISSUE

### More Scientific Papers from China

The Institute of S&T Information of China unveiled on December 9, 2008 the statistical results of Chinese papers published in 2007. In 2007, SCI has collected 94,800 Chinese papers, or 33.5% up against 2006, ranking 3<sup>rd</sup> place after the United States and the UK. In the same year, EI collected 78,200 Chinese papers, with a growth of 20.3% compared with 2006, sitting in 1<sup>st</sup> place ahead of the United States. ISTP had 45,331 Chinese papers under its collection in the year, or 10.1% of the total, ranking 2<sup>nd</sup> place.

Statistics also show that Chinese authors have published in 2007 208,000 papers in major international scientific journals or proceedings, or 36,000 more compared with 2006,

enjoying 9.8% as a proportion of the world total, or 1.4% up against the preceding year. China sat in 2<sup>nd</sup> place in the world in 2007, in terms of the numbers of papers published, remaining in 2<sup>nd</sup> place as in 2006. The United States, China, Japan, the UK, and Germany are the first five countries having the most numbers of papers published. The 2007 statistics were made mainly based on the data published by SCI, EI, and ISTP.

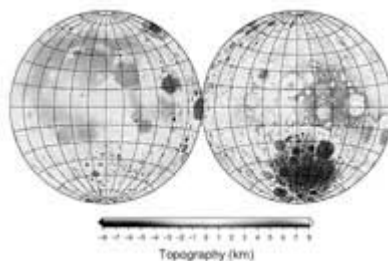
In 2007, ISTP collected 45,331 papers presented by Chinese scientists at major international conferences, or 10.1% as a proportion of the world total, ranking 2<sup>nd</sup> place. Chinese papers presented at international conferences have enjoyed a growth that is higher than the world average. Chinese scientists have been part of 2,416 international conferences held in 73 countries (regions) in the year.

In the same year, of the Chinese papers collected by SCI, the one derived from international cooperation accounted for 20,828 in number. Of them, the one with Chinese scientists as the lead author reached 11,355 in number, with collaborators from 90 countries and regions. The one with scientists from other countries (77 countries and regions) as the lead author and Chinese scientists as co-authors accounted for 9,473 in number.

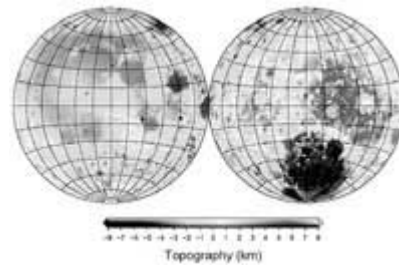
CSTPCD collected 1,765 titles of core scientific journals in 2007. These scientific journals have published 463,122 papers with Chinese scientists as the lead author, or 58,264 more compared with 2006, enjoying a growth of 14.4%. Overseas scientists have published 3,182 papers in Chinese scientific journals, or 232 more compared with 2006.

## RESEARCH AND DEVELOPMENT

Lunar Peak: 9840m



CLTM-S01 derived from Chang'e I satellite : 3,214,489 valid spots ( two months )



CLTM2 from US Clementine spacecraft: 72,300 valid spots ( two months )

Chinese scientists have calculated out the highest peak on the moon to be 9,840m, or nearly 1,000m higher than the Mount Qomolangma (Everest), based on the data sent back from Chang'e I satellite. US Clementine moon spacecraft deduced the highest point of the moon to be 8,000m in 1994.

Chinese scientists have so far completed the moon mapping using the data collected by Chang'e I satellite, and reported the satellite based lunar terrain mapping in a paper published in the 2008 11<sup>th</sup> issue of *Science in China (Series G)*. Chinese scientists established a lunar terrain model based on the data collected by the altimeter aboard Chang'e I satellite. An analysis of 3.21 million height data has resulted in the world's finest lunar picture with the highest resolution. The lunar terrain map produced by the United States does not have north and south poles. Chang'e I satellite has for the first time obtained the high resolution terrain data over the two lunar poles, and produced the first complete lunar surface terrain map in the human history.

In the context of spatial resolution, US Clementine spacecraft reached 70 km in 1994, while China's Chang'e I satellite has an enhanced resolution to 2km. Clementine's terrain map is quite vague, with an outstanding back of the moon. Chang'e I satellite has a precision 10 times that of Clementine, and a height precision 4-5 times that of the latter.

## Moon is Rounder than Earth

Based on the data collected by the Chang'e I satellite, Chinese scientists have for the first time accurately measured the highest and lowest point of the moon. They found that the moon is rounder than the earth, with  $1/963.7256$  against  $1/298.257$ . China published a full moon image on November 12, 2008. Chinese scientists are currently validating the height of image data, attempting to produce the Moon's 3-D terrain map. The moon has its bottom in the polar region, and the peak on the back of the Moon. As a result, one cannot see the two from the earth. The data collected by the Chang'e I satellite has reduced the error by some 200 km. China's lunar model has reached a resolution of 30m, with other countries' being at 100m.

## China's First High Performance PC

Not long ago, China's first high performance PC (PHPC100), developed by DAWNING, rolled off the assembly line in Tianjin. The mini supercomputer has a size of two regular desktop mainframes, but with a speed 40 times the regular desktops. The high performance PC is designed by DAWNING to accommodate the needs of small and medium users without computer rooms. Using regular 220V power source, and with a noise level similar to that of an air conditioner, the new machine takes up the space for resting a file cabinet. Featured with high performance computation, conveniently deployed operations, and an all-round control mechanism, the new computer is able to noticeably enhance users productivity and efficiency, allowing the minimized IT operation and maintenance cost. The computer has been purchased by Zhejiang University to assist the computation assignments for chemical materials, aviation, and space programs.

## Multifunction Space Friction Lab

CAS Lanzhou Institute of Chemical Physics disclosed on December 8, 2008 that a study team, led by LIU Weimin, a research fellow at its national key lab for solid lubricants, has developed a multifunctional system to test space frictions. Recently passed an approval check, the experimental system is designed to test the frictions of materials under the environment having atomic oxygen, ultraviolet light, proton/electric beams, high and low temperatures, and high vacuum. It will help scientists to understand the impacts of space environment on the frictions of lubricant materials, and work out novel and long lasting lubricant materials and lubricant making techniques desirable for space applications. Researchers explained that space environment is highly vacuumed, featured with large temperature differences, atomic oxygen, and ultraviolet light. As a result, it is difficult to develop an experimental system to simulate the frictions in space environment. The new system has successfully integrated the functions of space environment modeling and friction testing, in line with the special details of the environment where spacecraft operates, allowing friction tests under a simulated space environment.

## New Findings on Heart Failure

With the support of National 973 Program, researchers at Harbin Medical University have found new targets that would lead to the prevention and treatment of heart failure, malignant arrhythmia, and sudden cardiac death, through studying the molecular genetics of the diseases, screening out susceptible genes, pathogenic genes, and biomarkers, and establishing animal models for the purpose.

Heart failure and malignant arrhythmia prevention and control, a basic research project initiated two years ago, has found a new gene mutation that would induce Atrial Fibrillation

(AF), unveiled for the first time the role of micronucleotides in regulating heart failure and sudden cardiac death. Researchers established the internal relationship between micronucleotide-1 and micronucleotide-133, and found the new signal paths for myocardium hypertrophy and cell apoptosis. The finding has been published in a number of journals, including *Cells*, *Circulation*, and *Biochemistry*.

## China's AIDS Vaccine Safe and Effective

SHAO Yiming, chief specialist of China CDC said on December 1, 2008 that China's proprietary AIDS vaccine has completed its phase I clinical trials, and the vaccine is "very safe with a very good result". DNA-Tiantan vaccine, jointly developed by China CDC and Beijing Vaccine and Serum Institute, entered phase I (Ia) clinical trials in December 1, 2007, and is currently in phase II (Ib) trials. Earlier animal experiments showed that the vaccine was able induce strong immune response in rats and monkeys' body fluids and cells, preventing them from being infected. Quite different from the prevailed design and techniques used for preparing such vaccine, China's vaccine is made by replicating vaccine viruses, or the live vaccine for the technical term.

## BEC Realized in China

Not long ago, CAS Shanghai Institute of Optics and Fine Mechanics (SIOM) has realized the Bose-Einstein Condensate (BEC) on an atomic chip. With the support of National Natural Science Foundation and Ministry of Science and Technology, SIOM has worked on BEC since 2003, in an attempt to establish China's first optic-mechanic-electronic atomic chip unit made up of an array of sub-systems, including super vacuum, optics, laser based frequency stabilizer, external magnetic field, high resolution super cooling atomic imaging, and programmed control. Researchers designed and developed innovative H chips with a static magnetic well, and the chips with a high frequency potential well. The chips have been used to cool gas atoms through laser and chip surface evaporation, and to study magnetic light well imprisonment, atom wave conducting, and super cooled atom mass split. Researchers realized the phase change to BEC on the said basis, by optimizing the design of different components and experimental links, and reducing the temperature of the super cooled atomic gas to 300nk. The Condensate has an atom number of 3,000, similar to what has been achieved in other overseas labs. The event indicates China's major progress in developing chip BEC, after the successful development of the first magnetic well BEC in the country.

## Encrypted Data Sharing

A study team, headed by CAO Zhenfu and DONG Xiaolei at Shanghai Jiaotong University Trustworthy Digital Tech Lab, has recently rolled out a mobile encrypted data sharing

equipment, and associated programs allowing encryption service on both servers and personal computers. The new technology is made up of a sharing solution for faster encryption and decryption, a mobile encrypted data sharing equipment, and utility programs. The mobile equipment is built on a single-chip processor with a size of 15.8cm x 10.2cm. It can be made into a chip in the future, for a greatly reduced size, either for independent use, or be incorporated into a mobile phone, or similar terminals. The light and compact mobile equipment can be connected to Internet, allowing the timely connection with the server for encrypted data transmission. Meanwhile, researchers have made encrypted data sharing on a personal computer possible. The technology has been strictly tested mathematically, with a security level reaching the highest CCA standard in the world.

## 8-inch SOI Wafer

A research team, led by WANG Xi, a research fellow at CAS Shanghai Institute of Microsystem and Information Technology, has worked out China's first 8-inch SOI wafer, indicating a major breakthrough in mastering the SOI technology.

WANG and coworkers developed an improved technique to clean the wafer, through upgrading the existing equipment, and designed a large SOI platform for 8-inch wafer bonding, with the real-time manufacturing process and quality control. The upgraded equipment enhances the wafer bonding. An optimal grinding technique was also developed through repeated tests, to produce a finely polished 8-inch SOI wafer using an improved grinding paste recipe.

NEWS BRIEFS

## Trillion Operation Computer

Lenovo Group Ltd. announced on December 4, 2008 that it has produced China's first utility supercomputer able to make 1.065 trillion operations per second. SHENTENG-7000, the new computer, is currently ranked in 19<sup>th</sup> place among the newly rated high performance computers in the world.

## Velvet Deer Gender Control Technique

Deer gender control technique, jointly developed by Fushun Institute of Forestry, Talimu University, and the Chinese Academy of Agricultural Sciences Institute of Special Products, recently passed an approval check. Researchers have successfully separated the X element

from the Y element in the fresh sperms collected from the red deer and Sika deer, and made them into frozen sperms for future applications, using advanced animal gender control technique. The gender controlled sperms have a fertilization rate as high as regular frozen sperms, enjoying a male calf producing rate as high as 90%. Researchers used a range of advanced techniques to produce the hybrid deer with a predetermined gender, in an attempt to produce more male velvet deer for their antlers.

---

Comments or inquiries on editorial matters or Newsletter content should be directed to:

Department of International Cooperation, MOST 15B, Fuxing Road , Beijing 100862, PR China Tel: (8610)58881360 Fax: (8610) 58881364

<http://www.most.gov.cn>