Science, Technology and Education News from China

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Introduction

This month's newsletter starts with an editorial on China's plan to further advance basic research. Also in this month, the test module of Tiangong-1 space station was successfully launched, marking a concrete step in China's space science research. In education, migrant's schools were forced to close in Beijing despite the facts that children of migrants struggled to find education opportunities. China Scholarship Council offers more scholarship opportunities to students in 2012. In health, grassroot doctors in rural areas might open their official clinics. Chinese scientist Dr. Tu Youyou was awarded Lasker Award, the "precursor to the Nobel Prize".

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[1] Please click on the blue texts to activate the hyperlinks to either email addresses or related websites.

Policies

Guiding Policy on China's Basic Research Released

According to the recently released State Statistics Bureau report on China's investment on science and technology 2010, China's R&D investment accounted for **1.76%** of the GDP. It is higher than 2009 (1.7%) but still failed to reach the 2% goal set by China's 11th Five Year Plan FYP, making R&D/GDP one of the very few missed goals of the 11th FYP.

Inadequate support on basic research has always been one of the main critical points in China's S&T development. The new statistics showed that out of the CNY 706.2 billion funding for R&D in 2010, only CNY 32 billion goes to basic research, a mere 4.5%, whereas funding for product/service development reached CNY 584.4 billion.

Responding to the obvious lack of attention on basic research and Chinese leadership's constant call to strengthen basic research capability, the Ministry of Science and Technology MOST, the Ministry of Education MOE, Chinese Academy of Sciences CAS, Chinese Academy of Engineering CAE and National Science Foundation China NSFC jointly issued an ***Opinions on Measures to Advance Basic Research*** in September, an implementation plan for the 12th FYP on Science and Technology.

The general goals of this opinion is to make sure China rises as "an important innovation actor" by 2020, and to see that funding for basic research increases "quickly and significantly" in the coming years. The opinion stayed away from setting any quantitative goals but instead set several interesting tones for future development.

It is stated in the opinion that the government, namely MOST and NSFC, should still be the main funding agents for basic research, while industry is "encouraged to also get involved". The funding mechanism should further be optimized to combine competitive-based funding and stable financial support. Introduction of this new measure could be seen as a response to several renowned Chinese scientists who have been criticizing the current application of Chinese funding system of wasting too much of scientists' time.

The current funding instruments, namely the MOST projects such as "973" and national key science and technology projects and NSFC projects will remain, but will play different roles. MOST projects are expected to reflect national interests and national priorities, while NSFC projects could be more exploration-driven and focus more on young researchers.

In terms of international cooperation, for the first time, "further opening China's national S&T projects to the world" and "advancing the establishment of international joint labs and joint research center" are written in the guiding policy. International scholars' long term research in China and short-term visit and exchange with China are both welcomed, as it will increases the international presence of China's research institutes.

To address the current situation where less and less students are motivated to pursue a research career, "move proactively to establish a good second-tier team for basic research" was also included for the first time. Specific measures include encouraging innovation among bachelor and master students (MOE will soon release a specific plan on this), incentives for excellent young researchers and better packages for technicians working in laboratories to "stabilize" them in their jobs.

Reform on evaluation mechanism is also clarified in the opinion. Academic societies will also play a role in evaluation of scientific projects. The number of academic papers published should not become the only criteria in evaluating institutional and personal research performance. Failure in research should be "tolerated" and curiosity-based research is to be "encouraged. "Zero tolerance" must be adopted in academic fraud and plagiarism.

News

1. China Launches Tiangong-1 Space Station Test Module

(*Guardian,* 29-09-2011)

China has launched an experimental module to lay the groundwork for a future space station, underscoring its ambitions to become a major space power.

Tiangong-1 was shot into space from the Jiuquan launch centre on the edge of the Gobi desert aboard a Long March 2FT1 rocket.

After moving it into orbit, China plans to launch an unmanned Shenzhou 8 spacecraft to practice docking manoeuvres with the module, possibly within the next few weeks. Two more missions, at least one of them manned, are to meet up with it next year for further practice, with astronauts staying for up to one month.

The 8.5-tonne module, whose name translates as heavenly palace, is to stay aloft for two years, after which two other experimental modules are to be launched for additional tests before the actual station is launched in three sections between 2020 and 2022.

"This is a significant test. We've never done such a thing before," Lu Jinrong, the launch centre's chief engineer, was quoted as saying by the official Xinhua news agency.

The space station, which is yet to be formally named, is the most ambitious project in China's exploration of space, which also calls for a moon landing, possibly with astronauts.

China launched its first manned flight in 2003, joining Russia and the United States as the only countries to launch humans into orbit.

However, habitual secrecy and the space programme's close links with the military have inhibited co-operation with other nations – including with the International Space Station.

2. "America's Nobel" Awarded to Chinese Scientist

(USA Today, 12-09-2011)

The Lasker Awards, announced on Monday by the Albert and Mary Lasker Foundation, carry a $250,000 prize per category and are widely considered the nation's most prestigious medical awards.

Besides Dr. Arthur L. Horwich and Dr. Franz-Ulrich Hartl, who won the award for basic medical research for their discoveries about protein folding, the foundation is honoring an 81-year-old Chinese scientist for her work on turning an herbal medicine into a widely used antimalarial drug.

The scientist is Dr. Tu Youyou, and the antimalarial drug is artemisinin, which was discovered decades ago. Dr. Tu also becomes the first Chinese scientist to receive this award.

Dr. Tu and her colleagues began their work in the 1960s, during the Cultural Revolution, when the Chinese government began a project to find a new malaria drug that could replace the standard treatment, chloroquine, which was losing effectiveness as malaria parasites developed resistance.

They scoured the literature on ancient Chinese remedies and collected 380 extracts from 200 herbs that offered promise. One of the plants they studied was sweet wormwood, or Artemisia annua, which was used by Chinese herbalists centuries ago to treat fever.

Dr. Tu and her team discovered a way to extract an active substance from the plant, removed a toxic portion of it, and demonstrated that it wiped out the malaria-causing parasite in animals. The resulting drug, artemisinin, was later shown to cure malaria in humans.

Today, artemisinin and its derivatives are typically coupled with other treatments to combat malaria, and the World Health Organization recommends this combination therapy as the "first-line treatment" against the disease.

"It is clear that Tu's insight and vision have saved millions of lives, particularly in the developing world, and continues to yield long-term medical benefits in the ongoing fight against this deadly disease," the foundation said.

That award is being renamed this year in honor of Mayor Michael R. Bloomberg of New York, who received it in 2009. The prizes are to be given at a ceremony in New York on Sept. 23.

(http://mytopnews.net/dr-tu-youyou-antimalarial-drug-pioneer-earns)

3. Rural health care policy aims to let "Barefoot Doctors" have clinics

(Xinhua, 21-09-2011)

More than 1 million village doctors provide basic medical services to nearly 700 million Chinese farmers. A majority of them began their training as barefoot doctors. Barefoot doctors acted as a part of an extensive health-care system promoted by late Chinese leader Mao Zedong. In the early 1970s and 1980s, many farmers volunteered to receive training to become barefoot doctors even though medical facilities and funds were scarce. The number of barefoot doctors was officially 1.46 million in 1980. Despite lack of professional training, they provided the basic medical needs for China's huge rural population during the country's planned economy era, when 90 percent of China's population enjoyed life-long, government-subsidized health care.

The system started to collapse in the early 1980s with the end of collective economy in rural areas, according to Chen Xiwen, an expert on rural issues who serves as deputy director of the Leading Group on Rural Work of the CPC Central Committee. Farmers could not afford the surging medical expense as subsidies were cut and the user-pays system was introduced. Rural medical facilities lost government financial supports and many had to close down. Thousands of barefoot doctors lost their jobs. As a result, rural China witnessed a vast shortage of doctors and medical facilities.

The Chinese government has been making efforts to improve health care services in rural areas through a new program called "one clinic in each village" or "one village doctor for every 1,000 farmers," in line with a health guideline released by the General Office of the State Council in July. To improve village doctors' living conditions, the government has also planned to improve their subsidies and income. A pension program is expected to be launched soon for that purpose, according to the guideline.

In addition, special funds have been established in many provinces and regions for the purchase of medical instruments and providing professional training to village doctors. With increasing government funding, the environment and facilities in many village clinics have begun to be improved, and they could attract more medical students in the future.

(http://news.xinhuanet.com/english2010/china/2011-09/21/c_131152375.htm)

4. Migrant's schools closed in Beijing

(The Economist, 3-09-2011)

The authorities' decision to shut down 23 migrants' schools across Beijing has outraged parents, the Chinese press and activists. Beijing officials justified the closures, affecting 14,000 children, on safety grounds. The schools, though sometimes long-established, are unlicensed. After the outcry, a few schools were granted a temporary reprieve. The government promised that all children at the others would be found new schools. That did little to curb questions about the government's motives. It has tried to close migrants' schools before, but not since 2006 on such a scale.

A shortage of schools in cities leads many children to stay with relations in villages. Many Chinese complain that this fuels delinquency. Statistics are unreliable, but perhaps 200m rural migrants are working in urban areas, with some 20m children. Many more children are left behind, in the care of relatives. Some cities have been much more adroit than Beijing in providing schools. Shanghai claims last year to have become the first city in China to provide free education for all migrant children, mostly in state-run schools, with some in subsidized private ones.

According to Chu Zhaohui, of the Ministry of Education's Central Institute for Educational Research, Beijing could afford to accommodate all of its more than 400,000 migrant children, some 40,000 of whom have little choice but to use unlicensed schools. But he says the city worries that it is growing unsustainably large. Figures last year showed that Beijing's population, including nearby towns and villages, had reached 20m, up nearly 45% on a decade earlier, and exceeding the city government's estimate for 2020.

(http://www.economist.com/node/21528301)

5. More Scholarship Opportunities for Overseas Study

(China Scholarship Council, 11-09-2011)

China Scholarship Council CSC will release 2012 Scholarship for Overseas Studies in November, but several changes in scholarships are already made public at the 2012 Scholarship Conference held in Changsha in September.

The overall number of scholarships for 2012 scholar year will increase from 13,000 in 2011 to 16,000, a 30% increase.

Among the 16,000 scholarship opportunities, 6,000 will be for graduate studies, the rest 10,000 are for senior researchers, visiting scholars and bachelor studies. The scholarship for graduate studies, formerly only opened to students in "211" and "985" universities, will be accessible to all university students in China. Self-supported Chinese students who are already studying abroad are also eligible for scholarship application.

For the first time, scholarships for bachelor students are provided by CSC. In response to the Ministry of Education's call to broaden university students' international vision, CSC will support short-term (3-12 months) overseas studies of bachelor students. This program is still limited to "211" and "985" universities.

For doctoral studies, CSC will continue to work with top international universities or research institutes and set up joint scholarships, in order to support top Chinese students' doctoral education abroad.

Application for 2012 academic year scholarship will start in March 1, 2012.

6. China's Uranium Quest

(The Jamestown Foundation, 02-09-2011)

On August 24, the head of Kazakhstan's national nuclear monopoly Kazatomprom announced plans to increase its uranium fuel pellet shipments to China by one hundredfold, from 2 metric tons this year to 200 metric tons in 2013 or 2014. This is welcome news in Beijing since, according to most experts, China's own deposits of uranium are insufficient to support the country's projected electricity output. The uranium deposits that were sufficient to supply China's nascent nuclear energy program now account for less than half of its annual uranium consumption. By 2020, China is expected to account for 20 percent of global uranium demand. The total Chinese uranium imports in 2010 were 17,136 tons, a threefold increase from 2009. China's ambitious plans to expand its nuclear program suggest that increase in imported uranium is not a fluke.

The largest producers of uranium are Kazakhstan (33 percent of world supply), Canada (18 percent) and Australia (11 percent). China's state-run companies are increasingly importing uranium from each of these and many other countries. Two large State-Owned Enterprises (SOEs)—the China National Nuclear Corporation (CNNC) and the China Guangdong Nuclear Power Company (CGNPC), as well as their subsidiaries—are the main companies responsible for procuring overseas uranium for China. While CNNC is larger, CGNPC has been more aggressive in securing foreign deals.

In exchange for access to uranium supplies, China has increased its engagement with its suppliers creatively. For example, Beijing has granted Kazakhstan's SOE Kazatomprom equity in Chinese nuclear fuel processing facilities, researched alternative nuclear power production methods with Atomic Energy Canada Ltd. and provided interest-free soft loans to the governments of Uzbekistan, Niger and other uranium-rich countries. Although Chinese companies continue to look for uranium resources around the world, they are wary to overbid for mines that lack proven valued resources. But the Chinese have shown

they will often pay above market prices for those mines, companies and other assets that are genuinely rich in natural resources.

(http://www.jamestown.org/single/?no_cache=1&tx_ttnews%5Btt_news%5D=38363&tx_ttnews%5BbackPid%5D=517)

7. Publication bubble threatens China's scientific advance

(Xinhua, 25-09-2011)

As China's economy has soared to the second place in the world, the country's scientific strength has also surged -- if only measured by the numbers. Chinese researchers published more than 1.2 million papers from 2006 to 2010 -- second only to the United States but well ahead of Britain, Germany and Japan, according to data recently published by Elsevier, a leading international scientific publisher and data provider. This figure represents a 14 percent increase over the period from 2005 to 2009. The number of published academic papers in science and technology is often seen as a gauge of national scientific prowess.

But these impressive numbers mask an uncomfortable fact: most of these papers are of low quality or have little impact. Citation per article (CPA) measures the quality and impact of papers. China's CPA is 1.47, the lowest figure among the top 20 publishing countries, according to Elsevier's Scopus citation database. China's CPA dropped from 1.72 for the period from 2005 to 2009, and is now below emerging countries such as India and Brazil. Among papers lead-authored by Chinese researchers, most citations were by domestic peers and, in many cases, were self-citations.

China has been investing heavily in scientific research and technological development in recent years to strengthen its innovative capacity, The proportion of GDP spent on R&D grew from 0.9 percent in 2000 to 1.4 percent in 2007, according to the World Bank. An IMF forecast in 2010 says China now ranks second globally in R&D spending. The IMF calculates China's R&D expenditure at 150 billion U.S. dollars when based on Purchasing Power Parity. Many see China's huge investment in R&D as the momentum behind the country's explosive increase in research papers.

China does mostly applied research, which helps drive manufacturing and economic growth, while basic research only accounts for 6 percent, compared with about 35 percent in Germany, Britain, and the United States, and 16 percent in Japan. China also falls behind the United States in multidisciplinary research.

In China, academic papers play a central role in the academic appraisal system, which is closely related to degrees and job promotions. While acknowledging the importance of academic papers in research, Mu Rongping, Director-General of the Institute of Policy and Management at the Chinese Academy of Sciences, believes a more balanced appraisal system should be adopted. "This is a problem with science management. If we put too much focus on the quantity of research papers, we leave the job of appraisal to journal editors."

The avid pursuit of publishing sometimes gives rise to scientific fraud. In the most high-profile case in recent years, two lecturers from central China's Jinggangshan University were sacked in 2010 after a journal that published their work admitted 70 papers they wrote over two years had been falsified. A study done by researchers at Wuhan University in 2010 says more than 100 million U.S. dollars changes hands in China every year for ghost-written academic papers. The market in buying and selling scientific papers has grown five-fold in the past three years.

Despite rampant fraud, China will continue to inject huge money into science. According to the latest national science guideline, which was issued in 2006 by the State Council, the investment in R&D will account for 2.5 percent of GDP in 2020.

(http://news.xinhuanet.com/english2010/china/2011-09/25/c_131158786.htm)

Events (October - November 2011)

October 2011

Beijing International Design Triennial
Date: September 28th to October 17th
Place: Beijing
Contact: Tsinghua University, School of Arts and Design

ENGINE China 2011
Date: October 8th
Place: Beijing
Contact: China International Combustion Engine Industry Association

The 4th Asia-Pacific NMR Symposium
Date: October 11th
Place: Beijing
Contact: Wuhan Institute of Physics and Mathematics, CAS

Swissnex China Lectures
Lecture by Dr. Hans Peter Wessels, State Councillor Basel Town
Date: October 11th
Place: Shanghai
Contact swissnex China

The 14th Beijing Conference and Exhibition on Instrumental Analysis
Date: October 12th
Place: Beijing
Contact: China Association for Instrumental Analysis

The International Symposium of Developmental Systems Biology on Transcriptional Regulation, CAS 2011
Date: October 12th
Place: Shanghai
Contact: Shanghai Institute for Biological Sciences, CAS

2011 Workshop on Engineering and Sociology
Date: October 13th
Place: Beijing
Contact: Graduate University of CAS

10th International Symposium on Functional Pi-Electron Systems (FPi-10)
Date: October 13th
Place: Beijing
Contact: Institute of Chemistry, CAS

Exhibition "La Suisse Plurielle"
Date: October
Place: Karamay (Xinjiang Province)
Contact: Embassy of Switzerland in China

6th World Congress Allelopathy
Date: October 16th
Place: Beijing
Contact: China Society of Plant Protection, CAST

The 9th International Pain Research Organization Symposium
Date: October 16th
Place: Shanghai
Contact: Shanghai Institute for Biological Sciences, CAS

2011 International Symposium on Temperature Effect
Date: October 18th
Place: Beijing
Contact: Institute of Atmospheric Physics, CAS

The 13th International Congress for Stereology
Date: October 19th
Place: Beijing
Contact: Stereo Society of China, CAST

The 12th Multinational Urban Traffic Conference and Exhibition
Date: October 19th
Place: Beijing
Contact: New Technology Development Center, CAST

The 6th International Conference on Knowledge, Information and Creative supporting System
Date: October 22nd
Place: Beijing
Contact: Academy of Mathematics and Systems Sciences, CAS

Power Transmission & Control Asia 2011
Date: October 24th
Place: Shanghai
Contact: China Hydraulics Pneumatics & Seals Association

The 7th International Conference on Semantics, Knowledge and Grid

Date: October 24th
Place: Beijing
Contact: Institute of Computing Technology, CAS

China International Wire and Cable Industry Exhibition

Date: October 26th
Place: Shanghai
Contact: Shanghai Electric Cable Research Institute

6th Art Science Society Lecture 2011
Individual Social Responsibility
Date: October 26th

Place: Shanghai
Contact: swissnex China

November 2011

The 16th China International Exhibition on Quality Control and Testing Equipment
Date: November 2nd
Place: Shanghai
Contact: Shanghai Research Institute of Materials

The Third Annual China civil Aircraft Conference 2011
Date: November 2nd to 4th
Place: Shanghai
Contact: http://www.cdmc.org.cn/ccac

2011 China International Beverage Industry Exhibition on S&T
Date: November 6th
Place: Shanghai
Contact: China Beverage Industrial Association

Nano-Potonics International Conference
Date: November 6th
Place: Changchun
Contact: Changchun Institute of Optics. Fine Mechanics and Physics, CAS

Asia-Pacific Forestry Week 2011
Date: November 7th to 11th
Place: Beijing
Contact: FAO APFNet

The 12th China International EP Exhibition and Conference
Date: November 9th
Place: Changchun
Contact: China Association of EP Industry

The 8th International Conference on Numerical Optimization and Numerical Linear Algebra
Date: November 7th
Place: Xiamen
Contact: Academy of Mathematics and Systems Sciences, CAS

2011 International Conference on Computer Science and Logistics Engineering
Date: November 11th to 13th
Place: Zhengzhou
Contact: http://www.iccsle.org

The 1st CMI International Symposium on Immunology
Date: November 12th
Place: Hefei
Contact: University of Science and Technology of China

The 6th International Conference on Genomics
Date: November 12th to 15th
Place: Shenzhen
Contact: http://www.genomeconference.org

BIT's 2nd Annual World Congress of Immunodiseases and Theraphy 2011
Date: November 18th to 20th
Place: Guangzhou
Contact: BIT Life Science

2011 International Conference on Power Science and Engineering (ICPSE 2011)
Date: November 25th to 27th
Place: Chengdu
Contact: http://www.icpse.org

Bio World 2011
Date: November 20th to December 1st
Place: Shanghai
Contact: IMAPAC Pet Ltd

Marintec China 2011
Date: November
Place: Shanghai
Contact: Ministry of Industry and Information Technology