

Science, Technology, Education and Health News from China

Number 134 –August 2015

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Introduction

The story of the month covers Shanghai Jiaotong University's latest Academic Rankings of World Universities 2014. In research, China will restrict drone and supercomputer export. China is prioritizing the development of chips technology. Zhongguancun Reports rise in patents, R&D investment. China's Sky Eyes help protect world heritage Angkor wat. China's first cloud hospital opens in Ningbo. In education, Zurich University of the Arts opens a design school in Shenzhen, marking the first Swiss higher education establishment in China.

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We also invite you to follow Swissnex on Weibo! <http://e.weibo.com/swissnexchina>*

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

Story of the Month

Shanghai Jiaotong University Publishes ARWU 2015

The 2015 Academic Ranking of World Universities (ARWU) is released today by the Center for World-Class Universities at Shanghai Jiao Tong University. Starting from 2003, ARWU has been presenting the world Top 500 universities annually based on transparent methodology and third-party data.

Harvard University remains the number one in the world for the 13th year, other Top 10 universities are: Stanford, MIT, Berkeley, Cambridge, Princeton, Caltech, Columbia, Chicago and Oxford. In Continental Europe, ETH Zurich (20th) in Switzerland takes first place, and University of Copenhagen (35th) in Denmark overtakes Pierre & Marie Curie (36th) in France as the second best university in this region. University of Tokyo (21st) and Kyoto University (26th) keeps their leading positions in Asia. University of Melbourne (44th) tops other universities in Oceania.

32 mainland Chinese universities made into the top 500 universities in 2014, the same amount as in 2013. Tsinghua University, Peking University, Shanghai Jiaotong University, Zhejiang University, China University of Science and Technology, Fudan University, Sun Yat-Sung University were ranked between 101 and 200. Xi'an Jiaotong University, Sichuan University, Southeastern University, Central South University, Shandong University, Tongji University, China Agricultural University, Beihang University, South China University of Technology, Lanzhou University, Tianjin University, Wuhan University and Nankai University were ranked between 301 and 400. Nanjing Medical University, Suzhou University, Beijing Union Medical College, Capital Medical University, East China University of Technology were ranked between 401 and 500.

7 Swiss Universities were ranked among top 300 in ARWU 2014, with Federal Institute of Technology Zurich (20th) leading continental Europe, followed by University of Zurich (54th), University of Geneva (58th), University of Basel (87th), Federal Institute of Technology Lausanne (101-150), University of Bern (151-200) and University of Lausanne (201-300).

The Center for World-Class Universities also releases the 2015 Academic Ranking of World Universities by Broad Subject Fields (ARWU-FIELD) and 2015 Academic Ranking of World Universities by Subject Fields (ARWU-SUBJECT). Top 200 universities in five broad subject fields and in five selected subject fields are listed, where universities from U.S. and U.K dominated the ranking.

Chinese universities did significantly better in recent years on **field ranking**. For the first time, 3 Chinese universities were ranked top 200 in the field of medical sciences (Shanghai Jiaotong University, Sun-Yat-Sung University, Fudan University). In the field of science, 3 Chinese universities (Peking University, Chinese University of Science and Technology and Tsinghua University) were ranked top 100, with Peking University leading nationally at 43rd. Together with Tsinghua University (12th), a total of 11 Chinese universities were ranked top 100 in engineering. Zhejiang University is China's leading university in life sciences and agriculture (101-105). Peking University and Sun-Yat-Sung University are the Chinese leaders in social sciences (101-150).

In **subject ranking**, 9 Chinese universities were ranked top 100 in mathematics, with Lanzhou University leading nationally at 37th. Chinese Science and Technology University (46th), Peking University and Tsinghua University are top 100 in physics. Tsinghua University (25th) and 9 other universities are top 100 in Computer Sciences. Peking University is the only Chinese university in the top 150 for economics.

News

1. Chinese Research to Orbit on the ISS for the First Time

(*GB Times*, 04-08-2015)

A Houston company has negotiated a ground-breaking deal to send a Chinese experiment to the International Space Station for the first time, despite a law banning NASA from cooperating with China.

According to the *Houston Chronicle* the deal, signed in the last week of July, will see Chinese scientists from the Beijing Institute of Technology pay about \$200,000 to NanoRacks for its services.

"This includes delivery of the experiment to the American side of the station in a SpaceX Dragon spacecraft and a berth in NanoRacks' orbiting laboratory facilities. In turn the company will send data back to the Chinese researchers," the *Houston Chronicle* reported.

The agreement could be an important moment amid an apparent change in climate around potential US-China cooperation in space. In June, the State Department announced a bilateral civil space cooperation dialogue, despite a congressional ban on NASA working with the Chinese.

NASA, chief among five major cooperating space agencies in the ISS project, has been prohibited entering into bilateral research and cooperation with China or Chinese entities by law. However this commercial contract is so far clear to put Chinese research on the ISS, though it may face further scrutiny in Congress.

SpacePolicyOnline notes, however, that collaboration with China can be authorized by Congress or if 30 days advance certification is provided to Congress that such engagement poses "no risk of resulting in the transfer of technology, data, or other information with national security or economic security implications" and does not involve known violators of human rights.

The research project at the heart of this development is being run by Professor Deng Yulin of the Beijing Institute of Technology. Deng told *gbtimes* that their experiments will focus on effects of space radiation on DNA and genes. "We want to see the impact of space environment on gene mutagenesis as well as the relationship between evolution and DNA mutagenesis. This is an important work, directly related to human health and development," Deng said.

Deng explained that completing a deal NanoRacks was no small achievement. "Firstly, the cooperation meets the requirements of US Congress. It's not an official cooperation but a commercial one. The cooperation is between us and NanoRacks. Secondly, our cooperation is limited to education and science which is beneficial to humankind."

"We all think it [the negotiations] was tough, but we chose the points of cooperation very carefully and take every aspect into consideration. I would call the whole process smooth. There are many difficulties, but I cannot disclose them. The International Space Station involves 16 countries. It is not easy to gain their support."

While China has been keen to express interest in working with the United States in space, Beijing is moving forward rapidly with its own ambitious plans regardless. The country already has a well-established human spaceflight program and aims to complete its own space station by 2023. Next year launch its second space lab, Tiangong-2, to which it will send the crewed Shenzhou-11 and a new cargo vessel, Tianzhou-1.

While there is currently a window to collaborate with China, as Russia and the European Space Agency have done, there may come a time when working with the US will be seen as too difficult and would complicate missions.

Professor Deng, however, is optimistic. "This new cooperation marks the first one after a suspension

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decades ago. It is an important step for both countries,” he said. “My understanding is it is not a big step, but finally we managed to take a step forward. I think it is meaningful.”

(<http://gbtimes.com/world/chinese-research-orbit-international-space-station-first-time>)

2. **China Restricts Drone, Supercomputer Exports to Protect National Security: MOC**

(*China Daily, 04-08-2015*)

China's restriction on drone and supercomputer exports is intended to protect national security and strengthen export controls on sensitive items, said a spokesman of the Ministry of Commerce (MOC) on August 4th.

Including drones and high-performance computers in export controls will help provide a safe trade environment for companies, promote healthy development of the industries and better fulfill international obligations, said MOC spokesman Shen Danyang at a monthly press conference.

Under the new rule announced by the MOC and the General Administration of Customs, starting from Aug. 15, companies that make certain drones and computers specified on the MOC website will have to register with commerce authorities and obtain a license before exporting them.

The items include drones capable of flight for longer than an hour.

The companies will need to provide copies of export contracts and documents indicating the technical specifications of the products and who will use them, according to the announcement.

Commerce authorities will inspect exports of these items, and those who violate the rule will be given administrative penalties or be held criminally liable.

China exported 160,000 civilian drones worth 750 million yuan (122.5 million U.S. dollars) from January to May. The number of drones was 69 times more than in the same period last year, while their sales value was 55 times that of the same period in 2014. Almost all of them came from the southern city of Shenzhen.

(http://usa.chinadaily.com.cn/business/2015-08/04/content_21498738.htm)

3. **The Chips are Up**

(*Chinanews.com, 05-08-2015*)

Chinese takeover of U.S. tech firms could prove beneficial to both countries, but will political concerns complicate things?

China's Tsinghua Unigroup Ltd. announced its plans to make a historic \$23 billion offer for Boise, Idaho-based chipmaker Micron Technology Inc., which--if approved--would be the largest takeover of any foreign firm by a Chinese company. It's small change, though, compared to the \$161 billion the Chinese Government has budgeted to spend on the chip industry over the next decade, according to McKinsey & Co., and the acquisition deal would give China highly desired technology to build memory chips for smartphones and computers.

In 2014, China spent more on importing chips than importing oil, according to a report of Xinhua News Agency, investing more than \$231 billion. Helping domestic manufacturers to gain the technology to build smartphones is essential to maintaining the country's overall economic development and global competitiveness. China wants to be known for its hi-tech manufacturing, much as Japanese electronics brands came to dominate the global market in the 1990s.

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By looking for a juicy acquisition of a struggling yet promising U.S. tech company, however, China is entering a world of strict scrutiny, amidst a market not used to such moves. Is the juice worth the squeeze for Unigroup?

If history is our guide, a deal seems highly unlikely between Unigroup and Micron. The United States has strict rules for foreign capital in its industries, especially from Chinese investors, market analysts told Bloomberg News. Micron is the world's fifth largest chipmaker by revenue and would give China instant entry to compete with global tech giants like Samsung, Toshiba and SK Hynix. Though Micron's profits have waned in the past year, the company is still seen as an important player in the domestic tech industry. It's up to the Committee on Foreign Investment in the United States (CFIUS) to decide, an inter-agency task force that has the power to stop mergers that might endanger national security.

The committee has already expressed concerns about Chinese government-backed tech firms investing in U.S. industries, especially as the use of "backdoors" becomes more common--encrypted access points that allow easy surveillance of a system's users. CFIUS has blocked plenty of U.S.-China tech deals, requiring Chinese networking company Huawei to divest 3Leaf Systems in 2011 and blocking its purchase of 3Com Corp. stock in 2008 over concerns between Huawei's founder and his ties to China's military.

Tech may be one of the last areas of cooperation between Chinese and U.S. companies. It's an area that is still very sensitive to U.S. lawmakers. They consider an acquisition of Micron a matter of national security as the chip manufacturer claims to have the broadest memory solutions portfolio in the semiconductor industry and holds more than 20,000 patents.

Unigroup already has several links to major U.S. companies, however. The tech firm acquired a controlling stake in Hewlett-Packard's China networking equipment unit in May and tech giant Intel announced last year it would buy a 20-percent stake in Unigroup for \$1.5 billion.

A report published by the Asia Society and Rhodium Group showed that Chinese investment is increasingly targeting U.S. hi-tech sectors. More than \$6 billion was invested in the first quarter of 2014 alone, in such fields as automotive, information technology, machinery, aviation and medical devices. Chinese investments have created or sustained more than 25,000 U.S. jobs, according to the report entitled High Tech: The Next Wave of Chinese Investment in America.

Last year saw one of the biggest tech deals between China and the United States ever, with Chinese hardware manufacturer Lenovo snapping up Motorola in January 2014. Motorola went from losses of \$384 million in the last quarter of 2013 to profitable revenues of \$1.9 billion. Lenovo is now gearing up to launch a new Motorola smartphone this year and has climbed to third place in the global smartphone market with 76 million devices sold in the past year.

Are Unigroup's aspirations for Micron just a "fantasy" as analysts claim? Perhaps, but the trend toward increased M&A activity in the tech market is clear. Unigroup won't be the last company to come knocking on the door of U.S. tech manufacturers needing an infusion of fresh investment.

"This ought to be the most positive new trend in the bilateral economic relationship in several decades," said Daniel Rosen, co-founder of the Rhodium Group during the release of the report. "Unfortunately there have been misapprehensions on both sides that took a really positive story and turned it into an anxious story, a fraught one."

Despite fears that Chinese companies will "steal" patents and intellectual property and shut down U.S. factories in favor of cheaper labor back home, experts say investors usually take a localized approach. "In most of these cases where Chinese companies come in and acquire a U.S. company, they've actually increased local staff post-acquisition," said Thilo Hanemann, research director at the Rhodium Group. "That's exactly why they come here, because there's a lack of talented staff back in China and they're trying to actively tap the talent here in the United States."

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The primary value proposition for most Chinese investors is not a quick grab of patents or other removable physical assets but intangible and non-removable assets such as the skills and know-how of staff, management experience, brands, and proximity to local customers, according to the report.

(<http://en.people.cn/n/2015/0805/c202936-8931851-2.html>)

4. Zhongguancun Reports Rise in Patents, R&D Investment

(Xinhua, 05-08-2015)

The Zhongguancun Science Park in Beijing, dubbed China's Silicon Valley, has reported a boost in patents, research and development funds, and new companies this year, helped in part by national policies and reforms.

In the first half of 2015, enterprises in the park gained 14,240 patent licenses, up 31% year on year, according to statistics from the park's administration committee.

The park's invention patents numbered 5,538 in the first six months, up 51.3%.

The pilot technological area based in Haidian district is the country's first innovation demonstration zone approved by the State Council in 2009 and aims to become a technological innovation center with global influence.

In May, Premier Li Keqiang visited the park and talked with young people to show support for entrepreneurship and innovation, which the country has been encouraging amid an economic growth slowdown.

Currently, the park has 1.75 million employees, about 25% of whom are technical personnel.

From January to June, the total research and development investment of firms in the park reached 52 billion yuan (US\$8.5 billion), up 12.3% year on year.

Some 8,577 new tech companies were founded in the park in the first five months, according to the data. The total revenue of designated large enterprises in the zone reached 1.59 trillion yuan (US\$256 billion) in the first half, up 10.2% year on year.

The capital city aims to develop itself into an innovation center as part of its development plan, which also calls for the closure of polluting factories and the transfer of downtown wholesale markets elsewhere to deal with overcrowding.

(<http://www.wantchinatimes.com/news-subclass-cnt.aspx?cid=1102&MainCatID=&id=20150805000016>)

5. China's Sky Eyes Help Protect World Heritage Angkor Wat

(CAS, 11-08-2015)

Think heritage protection, and the restoration and conservation of historic sites comes to mind. Crowd control and on-site monitoring to limit visitor numbers are also common measures.

Now China's eyes in the sky are providing a new level of protection for the ruins of Cambodia's Angkor Wat, the magnificent temple of the Khmer Empire, which faces inundation by tourists and environmental dangers.

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Chinese satellites are using remote sensing to collect and process images of the site in real time. The technology offers particular advantages in instantly observing and analyzing the effects of natural disasters.

"Basically, we have eyes in the sky and we can see what happens to the ancient temples and their environment immediately," says Hong Tianhua, deputy director and secretary general of the International Centre on Space Technologies for Natural and Cultural Heritage under the Auspices of UNESCO (HIST).

HIST is the first and only institute in the world to use remote sensing technology to preserve cultural heritage sites under UNESCO.

A memorandum of understanding, signed by the Institute of Remote Sensing and Digital Earth (RADI) of China, Chinese Academy of Sciences (CAS), HIST and Cambodia's Authority for the Protection and Management of Angkor and the Region of Siem Reap (APSARA) in 2014, enables cooperation in the use of Chinese satellite data.

China then started to help APSARA build a ground station to receive and share the data. It also helped provide training in the technology to managers and researchers of world heritage sites from 12 developing countries in Asia and Africa, including Cambodia, through international workshops.

Trained staff can now compare new data with that collected in the past to identify any abnormal changes, providing a scientific basis for decision-making, says Hong. They can also create 3D visualization of large sites for analysis. "For the first time ever, our systems are monitoring the temples and their neighboring mountains and rivers. Those temples are sacred places for locals and mean a lot to them. They are grateful and we are proud to help," he says.

UNESCO has been helping the preservation and rebuilding of Angkor Wat since the 1980s. In 1992, Angkor Wat was listed as a World Heritage site. China began helping with the restoration of the ruins of Angkor in 2000 together with more than 20 countries. Most of the 98 temples were completed by 2013.

"The restoration took a lot of time and effort as the temples were built with stone. Specific stones of the same type and size were required to preserve the originality of the architecture", says Hong. More tourist facilities had been built to cater for the huge number of visitors and underground water was collected, while the natural environment of Angkor was destroyed by logging activities. "We noticed, through the 'sky eyes' system, that forests to the north of the heritage site are decreasing as hotels mushroom, and underground water levels are falling. We have reported the discoveries to the site managing authorities for them to deal with," says Hong.

HIST has been considering extending the three-year agreement with APSARA. It is also ready to help to preserve more world heritage sites. "Since the Belt and Road Initiative was announced by President Xi Jinping last year, cultural exchanges and cooperation among different member countries and China are ready to develop. The world heritage sites on the Silk Road are our top priorities."

(http://english.cas.cn/newsroom/news/201508/t20150811_151258.shtml)

6. Zurich University of the Arts Helps Launch Design School in Shenzhen

(ZHDK, 31-07-2015)

For more than three years, the Zurich University of the Arts (ZHdK) has played a significant role in a project to develop a design school in Shenzhen in the Chinese province of Guangdong. The project is part of a strategy by the Canton of Zurich to step up cooperation with this economically strong province, including the education sector. On Tuesday, July 28, a cooperation agreement was signed by the Shenzhen Government and the three partner schools ZHdK, Harbin Institute of Technology (HIT Shenzhen) and the Institute for Advanced Architecture of Catalonia (IAAC). The agreement follows on from a preliminary project that has been developed by the partner schools under the leadership of ZHdK.

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Lecturers and other staff will have the opportunity to acquire experience in a major international project, cooperating with one of the largest universities in China (HIT) and one of the world's leading architecture schools (IAAC), while benefiting from the strong practical focus provided by the involvement of local companies and institutions. Exchanges will give lecturers and students the opportunity to carry out teaching, learning and research within an extremely dynamic cultural and economic environment. The project also facilitates access to the huge Chinese market for Swiss designers.

“For ZHdK this is a promising project, and I am very satisfied the cooperation agreement has now officially been signed by the four parties”, says Thomas D. Meier, president of the ZHdK. “This is a unique and ambitious project focusing on connecting European creative excellence with the dynamics of emerging China. Our aim is to build strong and sustainable partnerships and exchange between Switzerland and China. The advancement of design education strengthens the creative industries worldwide. Design is a powerful tool with a great capacity to address the needs of societies, and to suggest and implement clever solutions.”

Shenzhen is a city of 18 million people located to the north of Hong Kong. It is growing as fast as Shanghai and has the highest per capita income in China. The city is situated in a special economic zone known for the high density of production facilities. UNESCO declared Shenzhen the first City of Design in China in 2008.

On account of its growth, Shenzhen has a great need for educational institutions and wants to extend its offer into the fields of design and architecture. An International Graduate School of Design is now to be built, funded by the city of Shenzhen. The three partners, ZHdK, HIT Shenzhen and IAAC, will develop this school together on behalf of the city and ensure the quality of its programmes in the long term. The Shenzhen International Graduate School of Design is the largest project ever undertaken by a Swiss university in China. The Executive Board of the Universities of Applied Sciences in the Canton of Zurich approved the project in April 2014. The next stage will be to draft the service contracts that will enable the actual work to start.

(<http://www.switzerland65china.com/en/newsinfo-31.html>)

7. China's First Cloud Hospital Opens in Ningbo

(Daily Mail, 31-07-2015)

Patients will now be able to see doctors without leaving the comfort of their homes, as China's first 'cloud' hospital opens for business.

Ningbo Cloud Hospital, based in Ningbo, northeast China, uses advanced technology to offer video consultations and prescriptions at the click of a button, reported the *People's Daily Online*.

Doctors can access medical records electronically, while other information, such as daily heart rate and blood pressure, can be uploaded to the system using wearable technology.

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More than a thousand qualified doctors have already signed up to the online platform, which currently has 13 specialist clinics. These cover specialist medical conditions such as diabetes and high blood pressure.

After being examined by a doctor, patients are given prescriptions online and can even get medicine delivered to their doorstep. Patients can also go to the consultation center offline to receive services offered by the hospital, but they will still communicate with doctors via video.

The virtual hospital demonstrates how wearable technology has the potential to completely revolutionize healthcare, as patients' vital signs can be uploaded to the cloud.

Over 2,000 patients are currently registered for the on-line service, which is expected to rise significantly in the next few years.

Directors of the Ningbo Cloud Hospital hope the service will eventually be 'without borders' and provide efficient healthcare across the whole country.

China does not currently have a GP-based medical system, meaning patients often have to queue at hospitals for hours in order to see a doctor.

(<http://www.dailymail.co.uk/news/peoplesdaily/article-3178468/Seeing-doctor-never-easier-China-s-cloud-hospital-allows-patients-diagnosed-remotely-VIDEO.html>)

(Collaborating Opportunities)

Venture Leaders China

Date: October 20 – 30

Place: Beijing, Shanghai, Shenzhen

Contact: swissnex China

All Swiss University Alumni Gathering

Date: October

Place: Beijing, Shanghai

Contact: swissnex China