

Science, Technology, Education and Health News from China

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Introduction

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Story of the Month

Chinese science teleported into the lead in quantum race

(China Daily, 10-8-2017)

China has become the first country to send quantum keys – highly complex encryptions – from a satellite to a base on Earth, and to teleport light particles the other way.

The accomplishments are two major breakthroughs in the effort to create an unhackable global communications network.

The two experiments mark the completion of the second and third of the three main goals of Micius, the world's first quantum communications satellite, which China launched last year.

The first goal, to send entangled light particles further than ever before, was achieved in June. Entanglement is a phenomenon in which two or more particles can affect each other simultaneously regardless of distance. Entangled particles cannot be described independently of each other.

Bai Chunli, president of the Chinese Academy of Sciences, said China is now the world leader in quantum communication technologies and is working with scientists from Austria, Germany and Italy. He said Micius will continue to perform experiments until its expected service life expires next year.

"The trio of quantum experiments will be central to any global space-based quantum internet," Karl Ziemelis, chief physical science editor at Nature magazine, said in a video interview. The magazine published two articles about China's breakthroughs on 10 August.

"They are testaments to China's investment and significant effort in physical sciences ... and pushed research in practical quantum communication technology to such astronomical heights."

All private data, from bank accounts to social media pictures, are protected by "keys", which are extremely complex mathematical codes transmitted between users and companies. However, these codes can be exploited if a hacker "eavesdrops" on these keys during transmission.

Quantum keys use quantum physics rather than math to encrypt data, making them impossible to hack by conventional computers. They also have the ability to alert authorities when someone tries to eavesdrop, said Pan Jianwei, an academican with the Chinese Academy of Sciences and the chief physicist behind Micius.

"This will have major applications in government, military, finance, energy and other fields where security is paramount," he added.

However, distributing quantum keys is difficult because sending them over long distances via fiber optics or during daytime results in massive signal loss or disturbance.

In the latest quantum key experiment, Micius beamed photons – individual particles of light – and created an optical link with the observatory station in Xinglong, Hebei province. When the link was at 1,200 kilometers, scientists discovered that quantum key distribution efficiency between the two improved 100 quintillion times (1 followed by 20 zeros) compared with fiber optics of the same length.

Micius produced and transmitted about 300,000 bits of quantum keys during the experiment. One practical use for these keys is to create advanced encryptions that are impossible for computers to hack with "brute force", a method in which a computer guesses all possible combinations of a pass code.

"Combine all the computing power of the world, which is around two to the power of 80 to 100, it will still take years for it to guess the correct combination," Pan said.

The second experiment is about one of the biggest mysteries of quantum mechanics known as quantum teleportation, Ziemelis said. In the experiment, Chinese scientists "spookily" transferred a photon on Earth to Micius in space, without needing the object itself to move.

"Its effect is like the Star Trek teleporter," said Pan. It works by deconstructing a photon on Earth, then sending its extracted quantum information to Micius's receivers via entangled link. Then an entangled photon in space downloads the information and takes on the complete identity of the original.

This experiment would have great theoretical research value in quantum science, as well as building a large-scale quantum internet and computation networks. But scientists are still centuries away from building a teleporter capable of transferring something as biologically complex as humans, Pan said.

China also plans to build the world's first global quantum communication network by 2030. It will consist of three high-orbit and dozens of lower-orbit quantum satellites connecting dozens of ground-based stations and networks.

"But the final number of satellites depends on its usage and market needs," said Pan, adding that there are other major hurdles to overcome, such as distributing quantum keys across continents during daytime. The latter feat was first achieved by China in July when Micius beamed one over 53 kilometers during the day.

The United States and Japan also have plans for quantum communication. Japan launched a microsatellite named SOCRATES in 2014, and it conducted its own quantum channel test in July.

However, Micius is a much larger, versatile satellite capable of different experiments, and has had more success. "China will lead the quantum space race for the next five years," said Pan. "But the world is also catching up fast."

(http://www.chinadaily.com.cn/china/2017-08/10/content_30399566.htm)

News

1. China gives nod to car-sharing services

(Xinhua, 08-8-2017)

China will support the country's booming car-sharing industry and standardize its development, according to official guidelines released on 8 August.

Unlike traditional car-rental services, car-sharing services take advantage of new technologies such as global-positioning and mobile Internet.

Such services improve user experience and offer an alternative for urban commuting, easing growing demand for private cars and parking space, according to guidelines released jointly by the Ministry of Transport and the Ministry of Housing and Urban-Rural Development.

Car-sharing firms should improve their services by checking the identity of users carefully and optimizing the supply of cars by using big data analysis, according to the guidelines.

They should also ensure the safety condition of the cars, and protect private information and user deposits.

Companies are encouraged to use a credit-based model to evaluate the reliability of users instead of requiring them to pay guarantee deposits.

In terms of parking, public parking lots in shopping centers and large residential areas are encouraged to offer space for shared-cars, while incentives will also likely be given to such cars for on-street parking.

Companies are also encouraged to use new energy vehicles (NEVs) as shared-cars, with support given for charging facilities of NEVs.

The guidelines followed the release of similar rules on bike-sharing services last week, which aim to help development of the industry.

China's sharing economy has been rising rapidly recently, with bike-sharing companies such as ofo and Mobike attracting overseas investments.

The country's sharing economy witnessed a total transaction volume of 3.45 trillion yuan (about 514 billion U.S. dollars) last year, more than doubling that of 2015, according to a report released by the State Information Center in March.

http://news.xinhuanet.com/english/2017-08/08/c_136508806.htm

2. Ofo lands in Austria

(China Daily, 28-8-2017)

Chinese bike-sharing titan Ofo Inc announced on 28 August it has landed in Austria, as the company ramps up the its efforts to expand the booming cycle empire into the overseas market.

The move marks the firm's latest move to fulfill its ambitious goal to pedal to 200 cities in 20 countries by the end of this year, as competition with its top rival, Mobike Technology Co Ltd, intensifies in the global market.

Dai Wei, founder and CEO of Ofo, said they saw great potential for Ofo's environmentally-friendly and affordable dockless bicycle services in Austria.

"Station-free bike sharing is our pioneering concept and has changed both the sharing economy and transport options in cities across the world. We recognize the demand for this type of public transportation and want to solve traffic problems in urban areas," Dai said.

Ofo said after reaching an agreement with the city of Vienna, capital of Austria, it would begin a one-month pilot phase in the city to allow all users to ride the yellow shared bikes free of charge.

After the pilot phase, the company will deploy a full fleet of 2,000 bikes across Vienna. Users will be able to ride the shared bikes by simply scanning a QR code printed on the bike via the downloaded app and paying 1 euro (\$1.2) per hour online on their smartphones.

Martin Blum, managing director and representative for cycling matters, Vienna said the station-free bike-sharing service was "the biggest innovation to public bicycle transportation methods ever".

"We are working in close cooperation with local authorities in order to ensure that Ofo becomes a valuable part of the range of transport on offer to Vienna's citizens", said Fred Dong, Ofo launcher for Austria. "We are excited about launching our service in Vienna, to make the city even more bike-friendly. We hope that we can advance our Austrian expansion further."

Founded in 2014, Ofo offers riders convenient bike-sharing services that allow users to rent and park the dockless shared bikes anywhere they prefer, while complying the local regulations.

The Beijing-based company, valued at more than \$2 billion after it raised \$700 million in its latest series E round of financing in July, currently operates more than 8 million bikes in over 170 cities across nine countries.

It has generated more than 25 million daily transactions and provided bike-rental services for over 100 million global users.

As in all other cities where it operates, Ofo will have a local support team in Vienna to manage bicycle distribution and maintenance. Employing an intelligent transport analytical system, the team is able to determine real-time traffic patterns and usage demands and then distribute the bikes to needed places.

The \$700 million funding Ofo raised is the biggest known round of financing in the bike-sharing industry to date, surpassing Mobike's over \$600 million round in June this year.

(http://www.chinadaily.com.cn/business/2017-08/28/content_31233186.htm)

3. Macau teams up with Alibaba to turn smart city vision into reality

(SCMP, 04-8-2017)

Macau is harnessing the cloud computing capabilities of Chinese technology giant Alibaba Group to help it transform into one of Asia Pacific's leading smart cities.

The special administrative region's government inked a strategic partnership deal with Alibaba on 4 August.

By leveraging the technologies of Alibaba Cloud, the group's cloud computing arm, the two parties will collaborate in upgrading the IT infrastructure in Macau to foster digital developments in tourism, transportation, health care, governance and talent development.

Residents and tourists visiting Macau are expected to benefit from the partnership, which will see Alibaba Cloud deploy all of the existing practices it uses in smart city projects across the mainland. These range from using artificial intelligence to optimise the management of road, air and water transportation to customising guided tours based on data-driven analysis.

Macau is the world's richest gambling hub, with casino revenues reaching 23 billion patacas (US\$2.86 billion) in July, according to official data released this week.

"Alibaba Cloud's big data and deep learning technologies have been helping to build 'city brains' in China to help local governments effectively make management decisions," said Simon Hu, senior vice president of Alibaba Group and president of Alibaba Cloud.

"We are confident about making Macau's transformation into a smart city a demonstration project across Asia-Pacific region," he said in an interview with the South China Morning Post, which is owned by Alibaba.

The partnership is for four years. In the first phase, from 2017 to 2019, it will focus on cloud computing, smart transportation, smart tourism, smart health care, and smart city governance, as well as talent development — Alibaba will carry out training programmes to help Macau build up a talented team of cloud computing and e-commerce professionals.

O Lam, head of Macau's office of the chief executive, said in a statement that they had decided to collaborate with Alibaba to foster the development of cloud computing and big data technologies after studying and researching other cities' experience of developing their own versions of smart cities.

"By leveraging the power of these technologies and connecting resources of different government departments, the project is expected to enhance the model of socio-economic operation in Macau, expediting the city's transformation into a smart city," O Lam said.

The partnership with Macau marks Alibaba's first smart city foray in markets outside the mainland. The group has a proven track record in smart city development, including Hangzhou City Brain, an artificial intelligence-enabled transportation management system, which has already increased traffic speed by 11 per cent in Hangzhou's Xiaoshan district, where the project is being piloted.

Under former chief executive Leung Chun-ying, Hong Kong government announced in 2015 the initiative to develop Hong Kong into a smart city, with Kowloon East – groomed to be the second major business district after Central – earmarked as a pilot area. The idea has been taken further as a commissioned study on Hong Kong smart city development by PwC, which was submitted to the innovation and technology bureau in June.

Hu of Alibaba said the company would be more than happy to bring its smart city solutions to Hong Kong. The company hasn't had any discussions with Hong Kong officials on smart city cooperation, but Hu said such dialogue will be carried out in the near future.

(<http://www.scmp.com/business/article/2105397/macau-teams-alibaba-turn-smart-city-vision-reality>)

4. JD.com offers US\$15m prize to find top drone-delivery experts and solutions

(SCMP, 30-8-2017)

Online retail giant JD.com has put 100 million yuan (US\$15.1 million) up for offer, to winners of a competition to find the best solutions to introduce widespread drone delivery services in China.

The company's current drone deliveries are limited to a number of rural areas, but the Amazon-like Chinese retailer said it is now looking for the world's top drone talent to design and create a more sophisticated service.

The novel logistics initiative was launched by officials in the north west city of Xi'an, while the retailer has also signed cooperation contracts with China West Airport Group, and Northwestern Polytechnical University to cultivate the next stage in drone delivery.

Ahead of launching the competition, and achieving what are expected to be considerable logistics cost savings, however, the company still faces airspace restrictions, and will have to meet strict safety conditions before being allowed a license to operate within the country's larger cities.

JD.com, for instance, has already been denied trial drone deliveries anywhere within Beijing's outermost sixth ring road.

Richard Liu Qiangdong, its founder and chief executive, nevertheless said the company has mainly applied drone deliveries in some of China's smaller cities and in countryside locations, where its logistics costs expect to be cut by as much as 70 per cent compared with services by car, van or motorbike.

The crux of its future plans will be designing and making drones that can fly further, and are capable of carrying heavier loads.

A JD.com's drone research and development centre is based in Xi'an, the capital of Shaanxi province, where the company will focus on developing "heavy-lift drones", said Xiao Jun, the firm's vice-president.

The Xi'an R&D hub expects to have 100 staff by the end of this year, he said, including the current 34 now developing the company's next generation of delivery methods.

Across Shaanxi, JD.com plans to build a low-altitude drone logistics network, spanning a 300-kilometre radius and including hundreds of routes and drone airbases to handle e-commerce shipments.

The company is also developing another "drone centre" at its headquarters in Beijing, mainly focused on developing smaller machines.

JD.com is already testing longer, stronger delivery flights in Sichuan province, in the southwest of the country near Shaanxi, which can carry as much as a tonne in weight after successfully trialling 5 to 30 kilogram packages. Those bigger loads should be possible by the end of this year, said officials.

"Drone deliveries are reducing costs and improving the efficiency of online shopping service, offering huge potential growth," said Wan Guangbo, an analyst from Changjiang Securities. "I believe JD will lead the global market in drone delivery service."

Of course, JD.com is not alone in its drone delivery ambitions, with China's other e-commerce giants and retailers frantically building and developing their own networks and expertise.

Companies including Amazon and Alibaba are already holding extensive drone delivery trials.

Shenzhen-based courier SF Express, meanwhile, has started commercial drone deliveries after receiving the country's first drone airspace license.

(<http://www.scmp.com/tech/china-tech/article/2109025/jdcom-offers-us15m-prize-find-top-drone-delivery-experts-and>)

5. Belt and Road countries to enhance health cooperation: communique

(Xinhua, 18-8-2017)

A communique was adopted on 18 August by countries involved in the Belt and Road Initiative to synergize efforts in medical emergency response and epidemic prevention.

The communique, approved at a symposium attended by officials from more than 30 countries, the World Health Organization and the Joint United Nations Programme on HIV/AIDS, is also aimed at protecting public health and strengthening people-to-people exchanges among countries under the initiative.

The countries agreed to set up a network for the research of health policies, jointly develop traditional medicine and boost medical staff exchanges, according to the communique.

Medical research institutes are encouraged to carry out cooperation in medical science, epidemic prevention, vaccine research and development, as well as clinical research, it said.

Countries involved in the initiative will also discuss mutual recognition of standards of accreditation of medicine and facilities, according to the statement.

Representatives from research institutes, NGOs, think tanks and enterprises also attended the symposium.

The Belt and Road Initiative, proposed by China in 2013, aims to build trade and infrastructure networks connecting Asia with Europe and Africa along the ancient Silk Road trade routes to seek common development and prosperity.

(http://news.xinhuanet.com/english/2017-08/18/c_136537248.htm)

6. China highlights importance of vocation schools

(Xinhua, 31-8-2017)

The Ministry of Education (MOE) announced China now has a total of 12,300 vocational schools with over 26.8 million enrolled students, highlighting the importance of the education system on 30 August.

Vocational schools nationwide have set up nearly 1,000 majors and 100,000 vocational training courses, recruiting an average of 9.3 million students each year, said Wang Jiping, an official with the MOE.

"China has established a vocational education system with Chinese characteristics, offering skills training for nearly all areas of the national economy," said Wang.

China has been highlighting the importance of vocational education in recent years, underlining its growing role in industrial upgrading, job creation and poverty alleviation.

In 2016, China's central government allocated 92.7 billion yuan (about 14.1 billion U.S. dollars) to local governments to support elementary and vocational education.

(http://news.xinhuanet.com/english/2017-08/31/c_136569058.htm)

7. Li calls innovation best way to compete

(China Daily, 28-8-2017)

Premier Li Keqiang called on domestic manufacturers to enhance technological innovations and improve quality of products as a way to upgrade the sector and increase global competitiveness.

The premier spoke to the management of a number of leading manufacturers on 25 August at a meeting promoting the Made in China 2025 strategy.

Manufacturing is the key to the nation's economic development, and the economic restructuring requires making the sector stronger, Li said. But the sector is still on the low to medium tier compared with other leading countries, thus it is vital to improve the quality and upgrade to increase competitiveness, he said.

The upgrade depends on innovations, and manufacturers should make technological breakthroughs by focusing on quality and branding and using top manufacturing countries as benchmarks, Li said.

Li called for management innovation to transform models for research and development and production, and increase the efficiency for resource allocation. He said manufacturers should also develop customized production to meet diverse demands.

He urged manufacturers to take advantage of China's rich human resources by promoting entrepreneurship and the spirit of craftsmanship, both requiring long-term input to cultivate high-quality managers and technicians.

Meanwhile, Li also pledged administrative reforms to further reduce unreasonable pre-entry approvals and permits, which will decrease institutional costs for manufacturers. However, market supervision will be strengthened to fortify intellectual property rights protection and crack down on counterfeit products, he said. Financial institutions are encouraged to provide aid to small and medium-sized manufacturers, he said.

With the world's largest manufacturing capacity, China's export-oriented manufacturing has been trying to shift the focus to domestic consumption and high added values in recent years. The central government has promoted more high-end manufacturing, including the strategy of Made in China 2025.

The State Council decided to promote the strategy by granting more favorable policies for the manufacturing sector at two executive meetings in May and July.

Li Dongsheng, chairman of TCL Co in Huizhou, Guangdong province, who delivered a speech on 25 August, said, "The meeting, which focused on improving the real economy and manufacturing, provided encouragement and support for manufacturers like my company."

The premier emphasized the key role of manufacturing to compete, he said. "Our manufacturing provides high-end products, besides those with fewer added values, and should strive for more well-known branding by using Germany and Japan as benchmarks. The meeting gave us confidence that we will make more highly value-added goods and world-leading manufacturing."

http://www.chinadaily.com.cn/china/2017-08/28/content_31207463.htm

8. Baidu offers facial recognition technology to help Beijing airport streamline boarding, traffic

(SCMP, 24-8-2017)

Baidu, the dominant Chinese internet search operator that's trying to recast itself as a leader in artificial intelligence, will provide its technology to streamline the operations and improve efficiency at Beijing's main airfield.

The company will provide the airport with its AI-enabled facial recognition technology for the admission of ground crew and staff, gradually expanding the capability to verify the identities of passengers. Eventually, passengers will be able to board their flights just by having their faces scanned at the airport, with the “face as boarding pass” capability ready for implementation as early as 2018, Baidu said.

The project comes at a critical time for New York-listed Baidu, as it tries to transform from being the dominant operator of China’s internet search into the country’s leader in AI, with applications from big data analysis to autonomous driving, after tighter government control in internet advertising hurt its revenues.

To be sure, Beijing airport isn’t the first test of Baidu’s technology. A similar application is at work at the Jiangying airport at the Henan provincial city of Nanyang, allowing passengers to verify their identities through facial scans against documented images before boarding their flights.

Airports around the world are embracing facial recognition to speed up their security and screening process, as they seek to free up workers for other tasks amid increasing demand for air travel.

Delta Airlines launched a programme in June at Minneapolis-St Paul, where passengers can check their bags automatically through kiosks that use facial recognition software to identify ticketed passengers. British Airways was reported in March to have introduced facial recognition-based border control that can seamlessly and quickly identify passengers at boarding gates at Heathrow airport.

Baidu’s project in Beijing will be much bigger in scale and scope, as the airport handled 94.39 million passengers last year, the world’s second-largest airfield by traffic.

Baidu has been pushing the application of its facial recognition technology for a while, touting its industry-leading accuracy. The tech giant says its facial recognition technology is up to 99.77 per cent accurate, that is able to distinguish people even better than the human eye.

Its facial recognition technology was first deployed last year for verifying identities at a popular tourist destination in Wuzhen, a water town in Zhejiang province, allowing visitors to gain entry using their faces, rather than tickets.

(<http://www.scmp.com/tech/china-tech/article/2108163/baidu-offers-facial-recognition-technology-help-beijing-airport>)