中国画报

A Window to the Nation A Welcome to the World

# CHINA PICTORIAL

VOL.830
AUGUEST 2017


## Ten Major Technological Achievements of China:

# Map to the Future

## 90th Birthday of the PLA

## Hoh Xil Heroes


ISSN 0009-4420

邮发代号2-903 CN11-1429/Z
国内零售价：10元

USA $5.10 | UK £3.20 | Australia $9.10
Europe €5.20 | Canada $7.80 | Turkey TL. 10.00

www.china-pictorial.com.cn

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# CHINA PICTORIAL

AUGUEST 2017

**Administrative Agency:** 主管：中国外文出版发行事业局
China International Publishing Group （中国国际出版集团）

**Publisher:** China Pictorial Publications 主办：人民画报社

**Address:** 社址：
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Publishing and Distribution Department, China Pictorial
人民画报社出版发行部

**Legal Adviser:** Yue Cheng 法律顾问：岳 成

**Printing:** Toppan Leefung Changcheng Printing (Beijing) Co., Ltd.
印刷：北京利丰雅高长城印刷有限公司

**Overseas Distribution:**
China International Book Trading Corporation (Guoji Shudian),
35 Chegongzhuang Xilu,
P.o. Box 399, Beijing 100044, China
**Telephone:** 86-10-68413849
**Fax:** 86-10-68412166
China Book Trading (Canada) Inc.
**Telephone:** 1-416-497-8096

出版日期 每月1日
国内刊号：CN11-1429/Z
国际刊号：ISSN0009-4420
京海工商广字第0121号

In China, subscriptions are available at any post office.

Subscription and distribution agency in Hong Kong, Macao, and Taiwan:
Hong Kong Peace Book Company, Ltd.
17/F., Paramount Building, 12 Ka Yip Street, Chai Wan, Hong Kong

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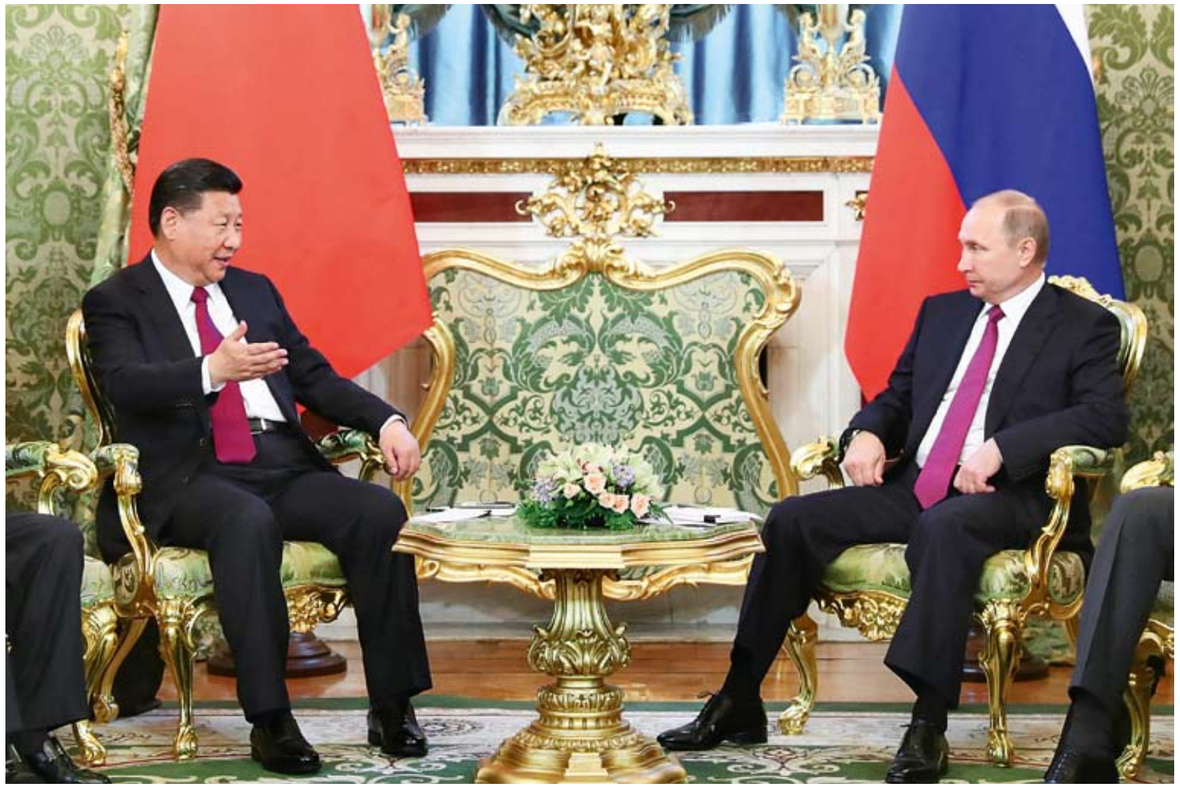


by Xie Huanchi/Xinhua

## Cornerstone for World Peace

July 4, Moscow, Russia: Visiting Chinese President Xi Jinping holds talks with his Russian counterpart Vladimir Putin at the Kremlin. Noting that China and Russia are good neighbors, friends and partners, Xi told Putin during the talks that the bilateral comprehensive strategic partnership of coordination is in the fundamental interest of both peoples and countries, which together create huge development potential and the ability to withstand international ups and downs.

The two leaders pledged to build strong China-Russia ties into the cornerstone of world peace and stability as the two countries seek to coordinate even more closely.

VCG

## Carrier for National Pride

July 11, Hong Kong: The People's Liberation Army naval formation led by aircraft carrier Liaoning ends its first port call in Hong Kong after a five-day visit to mark the 20th anniversary of Hong Kong's return to China.

As the first aircraft carrier to enter active service in China, the Liaoning represents a milestone for China's national defense. For Hong Kong, the ship is much more than an impressive piece of military hardware as it signifies the importance of the special administrative region to the central government.

VCG

## Mobike Rolls Out in UK

June 30, Manchester, England: Girls ride Mobike's shared bikes. Mobike, one of China's largest bicycle-sharing companies, launched service in Greater Manchester on June 29, its first major expansion outside Asia. About 1,000 bikes were put into use, some of which were unloaded overnight in key locations such as train stations, transportation hubs and popular destinations for food, shopping, leisure and entertainment.

Mobike's move in Manchester is just one example of how China's burgeoning sharing economy is spreading globally. The company has huge ambitions to expand its service to 200 cities in 2017, mainly by expanding internationally. Its arch-rival Ofo Inc. has also joined the race for global expansion.

Their services, which allow bicycles to be rented with a smartphone and parked anywhere after use, have redefined short-distance travel and spawned fierce competition in the Chinese market and abroad.

By Xiong Qi/Xinhua

## Beating the Heat

July 15, Wuhan, Hubei Province: People play in a water park. A lengthy heat wave drove many citizens to the water park for cool fun. China entered Toufu, the first phase of Sanfu Days, also known as the dog days of summer, on July 12.

"Fu" means lying with one's face down, a reference to weather so hot that people rest on the floor to keep their body cool. "Sanfu Days" refer to the hottest days of the year, which are split into three periods: Toufu (first fu), Zhongfu (middle fu) and Mofu (last fu). This year, Sanfu Days last for 40 days stretching from July 12 to August 20.

When the Sanfu Days arrive, many Chinese people line up at clinics to receive Sanfutie, a bandage made of traditional Chinese herbal medicine that is used to treat coughing, asthma and arthritis. In many parts of China, it's a tradition to eat special dumplings on the first day of Toufu, that is, Toufu Dumplings.

Comment

# Strong and Steady: The Growing Chinese Economy

**Text by Du Feilun**

As the global economy has slowly recovered, China expanded its GDP by 6.9 percent year-on-year in the first half of 2017 with deepened supply-side structural reform. Every key indicator produced numbers better than expected. With more visible momentum, the Chinese economy will sustain steady growth at medium-to-high speed.

As it enters a "new normal" phase, the Chinese economy features stronger vitality of entities and momentum in macroeconomic development, improved supply-demand relations and corporate profitability, brighter market expectations and industry outlooks, steady growth and better livelihood.

Measures to promote the supply-side structural reform, which include cutting overcapacity, destocking, deleveraging, cutting corporate costs and shoring up weak economic links, have yielded promising results. By the end of May, China had completed 84.8 and 65 percent of its target to cut overcapacity of crude steel and coal, respectively, commercial residential housing for sale had dropped 8.5 percent year-on-year, and debt-to-asset ratio of industrial enterprises above the designated size had dropped 0.7 percentage points. Improved production and management led to better profitability. The primary business revenues and profits of industrial enterprises above the designated size grew by 13.5 and 22.7 percent year-on-year, respectively, from January to May of this year.

Brighter market expectations have injected momentum into the real economy. As of June, the Purchasing Managers' Index (PMI) of China's manufacturing industry was above 50 percent for 11 consecutive months which indicates expansion, and China's Non-Manufacturing Index (NMI) followed the same trend, remaining above 54 percent for nine consecutive months.

Stronger policies have increased terminal demand in China, making enterprises more capable to invest and export, and residents more willing to consume. In the first half of this year, infrastructure investment contributed around 46 percent of China's fixed asset investment, and the growth rate of private investment rose by four percentage points year-on-year. China's exports stopped shrinking and grew by 15 percent year-on-year while total retail sales of consumer goods benefited from upgraded consumption and grew by over 10 percent year-on-year.

The accelerated shift of driving forces for growth optimized China's economic structure. In the first half of this year, the tertiary sector played a crucial role as it accounted for over 54 percent of China's GDP, and stronger domestic demand drove consumption to become a primary engine with final consumption expenditures contributing over 63 percent to economic growth.

Stable pricing, employment and income are ensuring improvement in people's livelihood. In the first half of this year, the Consumer Price Index (CPI) rose by 1.4 percent year-on-year, with the prices of the other seven major categories of goods and services rising moderately except the declining food price. With 7.35 million new urban jobs created in the period, which accounted for 65 percent of China's target for this year, the nationwide survey-based urban jobless rate dropped below five percent. Growing along with GDP, China's per capita disposable income went up by 7.3 percent after deducting price factors.

Recently, global financial institutions including the International Monetary Fund (IMF) upgraded the 2017 growth forecast for the world economy, stating that developed economies will sustain modest recovery while emerging economies will likely stabilize and recover in the second half of the year. As the world economy warms up, China faces less pressure from periodic adjustments since internal growth drivers become strong enough to further release potential.

Although China is gaining more favorable conditions for steady growth, attention should still be placed on negative impact derived from pressure caused by structural conflicts. Measures such as promoting supply-side structural reform, streamlining administration, delegating power to lower levels, and cutting taxes and fees will continue to improve the environment for economic growth. Stronger entrepreneurship and innovation will drive market players forward with new technologies, new industries, new business forms and new business modes. The construction of the Belt and Road, integrated development of the Beijing-Tianjin-Hebei region, the Yangtze River Economic Belt and the Xiong'an New Area will all contribute to the creation of more space for China's economic growth.

The author is an expert with the economic situation analysis group of the Chinese Academy of Macroeconomic Research.

Buzzwords

## 包容性增长
## Inclusive Growth

**Edited by Li Zhuoxi**

First mentioned by the Asian Development Bank in 2007, the term generally refers to fair, reasonable distribution of economic growth through coordinated, sustainable development, both socially and economically.

From June 27 to 29, 2017, the 11th Summer Davos was held in Dalian with the theme "Achieving Inclusive Growth in the Fourth Industrial Revolution." At the opening ceremony, Chinese Premier Li Keqiang delivered a speech in which he pointed out that a major factor in maintaining China's steady economic progress was intensification of inclusive growth during the global economic downturn. He believed that such intensification guarantees comparatively balanced development and helps avoid an idle labor force and resources, enhance social fairness, and promote developmental inclusiveness, which can cumulatively create sustainable development.

In recent years, the idea of "inclusive growth" has been deeply rooted in domestic and foreign policies enacted by the Chinese government and become part of the global concept of development.

In the new era, China has conformed to megatrends of economic globalization and the new industrial revolution, evidenced by its inclusive development strategy, social system guarantees and improved policies and measures. The best example is the Belt and Road Initiative, a policy to counter a fragmented international situation and sluggish global economic growth and a platform to accelerate inclusive global growth, guided by the principle of "building a community with a shared future to blaze a new trail for peaceful world development and common prosperity."


Chinese Premier Li Keqiang addresses the opening ceremony of the 2017 Summer Davos. In the speech, he revealed that the secret behind China's steady economic development during the sluggish global economic growth has been to promote inclusive growth. Xinhua

Over the last few years, China has seen the emergence of many new business models such as bicycle sharing and mobile payments, thanks to the government's policy to promote "mass entrepreneurship and innovation." In today's China, people are finding wide-ranging opportunities change their lives, and more groups are sharing the national economic growth.

## 蓝色经济通道
## Blue Economic Passages

**Edited by Li Zhuoxi**

To promote better maritime cooperation under the Belt and Road Initiative, China has proposed a blueprint for three oceanic passages that collectively make the "blue economic passages" linking Asia and Africa, Oceania, Europe and other regions.

On June 20, 2017, China's National Development and Reform Commission (NDRC) and State Oceanic Administration jointly issued the *Vision for Maritime Cooperation under the Belt and Road Initiative* (hereinafter referred to as the Vision), outlining three "blue economic passages." It was the first time the Chinese government proposed an international plan to speed up maritime cooperation under the Belt and Road Initiative as well as one of the outcomes of the Belt and Road Forum for International Cooperation after the publication of the *Vision and Actions on Jointly Building the Silk Road Economic Belt and the 21st-Century Maritime Silk Road* on March 28, 2015.

The Vision stresses China's willingness to conduct comprehensive maritime cooperation in multiple sectors with countries along the 21st-Century Maritime Silk Road, to jointly establish an open and inclusive cooperative platform and to foster the development of a mutually-beneficial, win-win blue partnership that creates a "blue engine" for sustainable development.

According to the Vision, priority will be given to three blue economic passages. Ocean cooperation will focus on building the China-Indian Ocean-Africa-Mediterranean Sea Blue Economic Passage by linking the China-Indochina Peninsula Economic Corridor (westward from the South China Sea to the Indian Ocean) and connecting the China-Pakistan Economic Corridor (CPEC) and the Bangladesh-China-India-Myanmar Economic Corridor (BCIM-EC). Also in the works is joint construction of the China-Oceania-South Pacific blue economic passage, which will stretch south from the South China Sea into the Pacific. Another blue economic passage is also to reach Europe via the Arctic Ocean.

Yangshan Deepwater Port in Shanghai. Not long ago, the NDRC and the State Oceanic Administration of China jointly issued the *Vision for Maritime Cooperation under the Belt and Road Initiative*. It marked the first time the Chinese government announced a plan to speed up maritime cooperation under the Belt and Road Initiative as well as an outcome of the Belt and Road Forum for International Cooperation after publication of the *Vision and Actions on Jointly Building the Silk Road Economic Belt and the 21st-Century Maritime Silk Road* on March 28, 2015. VCG

According to the NDRC, cooperation in marketing, technology and information atop the shared ocean will be intensified as the world experiences a growing economic globalization and regional economic integration. Blue economic development has become consensus for the international community, and a movement towards more maritime cooperation and development has arrived. Enhancement of maritime cooperation has become the obvious choice to tighten economic ties among countries and accelerate mutual growth and collaboration.

# The 798 Art District: Gallery of Galleries

**Text and photographs by Evangeline White**

Located in the northeastern part of Beijing and a conveniently short walk from Wangjing South Bus Station, the 798 Art District has been one of my favorite spots since I arrived in the capital. Not only does it house the best work of contemporary art from China and the world, but also preserves countless fascinating stories with its historic buildings.

As a History major, I couldn't help but dig into the art district's background and history, and I was not disappointed with my findings. The community began in the early 2000s, when young artists started moving into the largely abandoned industrial area for the workspaces in which they could express themselves. This compound of disused Bauhaus-style workshops built in the 1950s still looks much as it has been since completion and even preserves original Maoist slogans on many of its walls. For me, the high ceilings, large, empty spaces and asymmetrical piping from the buildings' previous incarnation add to the ambiance and drama of the innovative art displayed on its walls. The area has rapidly grown in popularity, and in 2004 it held the first Dashanzi Art Festival, which landed the district on the global map.

The 798 Art District has grown in recent years and now displays a wide range of worldwide contemporary art while continuing to support the local art community.

As a representative of international contemporary art, the art district has become host to a collection of galleries, all celebrating innovative expression. Exhibitions range in both movement and medium, displaying pieces of every style. I was pleasantly surprised by how different and innovative many displays were compared to the more classical art that is seen most often back in the United Kingdom. I was particularly captivated by an exhibition at the Ullens Center for Contemporary Art (UCCA) called "The New Normal," which exhibited new works by 23 artists from both China and beyond. Everything at the exhibition aimed to tackle and respond to international issues plaguing society today. Instead of producing a purely visual experience, these pieces brought other senses into play to create an engulfing experience involving senses of sound, sight and color to elicit an emotional response.

The outdoor areas of the 798 Art District are also a gallery thanks to an extensive collection of street art and sculptural installations. These works range from small metal sculptures of insects to vast murals stretching the length of the street and adding a pop of color against the background of grey metal and concrete block from the industrial era.

The art district is more than just a hub of China's contemporary art movement. It is a community that continues to thrive and has become an incubator of creativity and innovation for anyone wishing to experiment and express themselves. The art district and its galleries continue to host workshops and seminars, which all contribute to the steady growth of an important expressive stronghold that continues to shape and promote the development of contemporary culture. Moreover, the art district inspires and celebrates both the old and the new. This is what makes it and its art relatable to all, regardless of age, nationality or belief.

Spending only one day exploring the expansive five blocks that make up the 798 is not nearly enough. There was too much to take in and appreciate. As an art aficionado and frequent patron of the arts back in London, I knew that when I left for Beijing to intern, the 798 Art District was a must-see. When I finally stepped into the art district, I thought I knew what to expect, but I had not truly prepared myself for the sheer size of the area or for the emotional response that the exhibits provoked. I was in awe of the artistic creations gracing my eyes. However, the welcoming atmosphere and sense of a perpetually developing artistic community draw me back, just as they have drawn many before me.

Bold graffiti and a large statue outside a 3D magic interaction gallery.

An example of the 798 Art District's industrial heritage.

Works outside the Zhu Bingren Art Museum.

A sculpture of dinosaurs in cages outside the UCCA.

A mural on a side street.

A bronze sculpture of a man holding a boy.

# Marching Ahead:

## 90th Birthday of the PLA

July 28, 2017: People visit a major exhibition commemorating the 90th founding anniversary of the PLA at the Military Museum of the Chinese People's Revolution in Beijing. VCG

On August 1, 2017, a spectacular rally marking the 90th founding anniversary of the People's Liberation Army (PLA) was held at the Great Hall of the People in Beijing. Chinese President Xi Jinping, also general secretary of the Communist Party of China (CPC) Central Committee and chairman of the Central Military Commission, addressed the gathering. In his speech, President Xi remarked that the PLA is moving rapidly toward "strong" informationized armed forces. Xi said that the PLA has transformed from a "millet plus rifles" single-service force to one that has fully-fledged services and basically completed mechanization. He also reaffirmed the CPC's absolute leadership over the PLA. "The Chinese people love peace," Xi declared. "We will never seek aggression or expansion, but we have the confidence to defeat all invasions. We will never allow any people, organization or political party to split any part of Chinese territory out of the country at any time, in any form."

July 30, 2017: Chinese President Xi Jinping, also general secretary of the CPC Central Committee and chairman of the Central Military Commission, inspects the armed forces of the PLA at the Zhurihe military training base as part of commemorations to mark the 90th founding anniversary of the PLA. by Li Gang/Xinhua

The PLA has come a long way since its founding in the wake of an armed uprising of 20,000 soldiers in the city of Nanchang on August 1, 1927. Various commemorations to mark the 90th founding anniversary of the PLA have been held across China recently, including a military parade at the Zhurihe training base in the Inner Mongolia Autonomous Region in late July and an ongoing exhibition at the Beijing-based Military Museum of the Chinese People's Revolution.

Over the past 90 years, the PLA has been following the absolute leadership of the CPC, dedicated to whole-heartedly serving the people and focused on contributing to the development of the nation. Since the 18th CPC National Congress, the CPC Central Committee with Xi Jinping at its core has embarked on a quest to build stronger armed forces. The PLA has since undergone bold, active and prudent reforms.

July 30, 2017: Armed police and special police in the military parade at the Zhurihe military training base. by Pang Xinglei/Xinhua

July 30, 2017: Flag guards hold the CPC flag, China's national flag, and the PLA flag at the Zhurihe military training base. by Cui Nan/China News Service/VCG

July 30, 2017: Air assault echelons in the military parade at the Zhurihe military training base. by Li Gang/Xinhua

July 30, 2017: A formation of mobile artillery in the military parade at the Zhurihe military training base. by Fei Maohua/Xinhua

July 21, 2017: Chinese President Xi Jinping (second left) and other top Chinese leaders visit an exhibition marking the 90th founding anniversary of the PLA at the Military Museum of the Chinese People's Revolution in Beijing. by Ma Zhancheng/Xinhua

During the exhibition commemorating the 90th founding anniversary of the PLA at the Military Museum of the Chinese People's Revolution, models of key PLA equipment in active service are on display alongside interactive exhibits that simulate drills. VCG

July 22, 2017: A guide speaks to visitors at the Military Museum of the Chinese People's Revolution. The exhibition traces major PLA battles, historical events, decision-making processes and achievements throughout its 90-year history. by Cai Yang/Xinhua

July 27, 2017: Photos of scientists producing China's own atomic and hydrogen bombs and man-made satellites attract visitors during the exhibition at the Military Museum of the Chinese People's Revolution. by Jin Liangkuai/Xinhua

Military reform has already led to historic breakthroughs in many sectors. Restructuring of the military forces has given the PLA a fresh look, boosted development of military industries and laid a solid foundation for the modernization of China's national defense and the PLA.

Today, China is closer than ever to reaching its goal of rejuvenating the Chinese nation and needs a powerful people's army now more than any other time in history. The PLA must devote all its efforts to building a powerful army, strengthening the army with Chinese characteristics and developing itself into a world-class military.

Based on news reports of Xinhuanet.com

Since the 18th National Congress of the Communist Party of China (CPC) in 2012, despite grave difficulties both at home and abroad, China has risen to the challenge and worked hard to press ahead, driving forward sustained, healthy economic and social development, under the leadership of the CPC Central Committee with Xi Jinping at its core.

During the past five years, China has achieved major progress in finishing building a moderately prosperous society in all respects, made important strides in deepening reform, and continued to exercise law-based governance. All of these achievements show that Chinese people have the courage, ingenuity, and ability to overcome any difficulty or hardship, and that there is even better development ahead for China.

# Ten Major Technological Achievements of China: Map to the Future

Renowned British scientist, historian and sinologist Dr. Joseph Needham (1900-1995) was known for his scientific research and writing on the history of Chinese science and especially "Needham's Grand Question." Specifically, he asked why the meteoric rise of modern science happened only in the West despite Chinese society being more advanced in many ways in ancient times. The question is now moot, however, because if trends continue as they are, today's meteoric rise in science will soon be led by China.

After the 18th CPC National Congress in late 2012, the *Outline of the National Strategy of Innovation-Driven Development* specified that innovation in scientific research would be the core of China's comprehensive development strategy. Since then, the country's achievements in scientific and technological innovation have drawn global attention, and China is back at the cutting edge of international science.

The speed of China's scientific and technological progress has only increased in recent decades. Now, its output speed in scientific and technological achievements even exceeds the country's economic growth rate. China's annual scientific and technological output ranks second in the world, and the country is quickly closing in on the United States. China's scientific and technological institutes lead the world in terms of the rapid growth in high-quality scientific output. Of the 100 global institutes with the biggest recent increases in scientific and technological output, 40 are in China.

Rapid scientific and technological development is the result of the long-term investment from the Chinese government. Across the past three decades, funding of China's National Natural Science Foundation has increased by 300 times. According to the latest statistics from the Organization for Economic Cooperation and Development, China's research and development spending surpassed Japan in 2009 and Europe in 2013 and is expected to overtake the United States by 2020. This massive input has enabled China to reap a handful of top global achievements, and localization is rising. Jiaolong, China's domestically designed and developed manned submersible, has created a world record in terms of deep-sea diving. China Railway High-speed 2 (CRH2) trains reach the world's top operating speed at 486.1 kilometers per hour. The successful debut of China's C919 jumbo jets made the country one of the few in the world being able to develop large passenger aircraft. China's quantum computer, which was unveiled this May, is the first machine based on single photons to dwarf the classical computer. The Five-hundred-meter Aperture Spherical Telescope (FAST), known as the "Eye of Heaven" in China, is the world's largest and most sensitive radio telescope. It is expected to maintain its world-class position for the next 10 to 20 years.

Scientific and technological innovation has never been as close to Chinese society as it is today.

# Super Rice

**Edited by Gong Haiying**

Grain has remained close to human civilization since the first people settled down to practice farming. Rice, one of the most eaten staple foods in the world, feeds over half of the global inhabitants, including 60 percent of China's population. As the world's earliest rice planting country, China has practiced rice plantation for nearly 7,000 years, and today rice accounts for nearly 50 percent of its total grain crop output. Numbers from the State Statistics Bureau show that in 2015, China produced a total of 208.25 million tons of rice, 193.1 million tons of which were consumed, and the country imported 3.37 million tons from abroad.

The role of rice, the "greatest force" in grain, is important to China and the whole world.

## Breeding "Super Rice"

April 13, 2017 was a special day for rice. At the 1st International Forum on Rice in Sanya, China, Yuan Longping, an academician of the Chinese Academy of Engineering, announced that Chinese rice was "approaching the target, at 90 percent, of producing 1,130 kilograms per *mu* or 17 tons per hectare."

China started the research of breeding super-high yield rice in the mid-1980s, a period in which Guangdong Academy of Agricultural Sciences, Shenyang Agricultural University, and China Rice Research Institute all contributed encouraging work. In 1996, China's Ministry of Agriculture launched the Super Rice Breeding Program. A year later, under Yuan Longping's guidance of "integrating morphological improvement and heterosis utilization," more than 20 scientific and technological research institutions joined hands to whisk the strategic process through four stages—700kg/*mu*, 800kg/*mu*, 900kg/*mu*, and 1,000kg/*mu*—accomplishing the target six years ahead of schedule.

Data shows that the first-phase super rice resulted in an average yield of 550 kilograms per *mu*. Wide application of the second-phase made an average output of 600 kilograms per *mu*, and that of the third-phase produced an average of 650 kilograms per *mu*. In 2015, Chinese super rice was growing in a total area of 960 million *mu*, playing an important role in guaranteeing grain safety in the country.

Increasing rice yield has always been a popular subject for international academics. In 1981, Japan led the world in breeding research. In 1989, the International Rice Research Institute (IRRI), Asia's largest international agricultural research institution based in the Philippines, launched a similar research program, which resulted in high yields in a small experimental area in 1994. That development was dubbed "super rice" as it gained global attention.

Some assumed that "super rice" was a new term for high-yield hybrid rice, but it can be produced as either conventional or hybrid.

Since 2005, China's Ministry of Agriculture has promoted a program to breed a new variety of "super rice" that can pass a series of strict certification procedures. By 2016, China had applied 125 species of "super rice" in agricultural production, 45 percent of which was conventional and the rest hybrid.

## "Father of China's Hybrid Rice"

The success of China's "super rice" is reminiscent of the emergence of high-yield hybrid rice.

The world's first hybrid rice was bred in Indonesia by American scientist Henry Beachell. However, China was the first country to successfully put hybrid rice into large-scale production, and that effort would not have succeeded without the efforts of Yuan Longping, dubbed the "Father of Hybrid Rice in China."

He is not only a widely-known name in China, but also a globally influential figure.

Yuan began hybrid rice research in the 1960s. His team led the world in the breeding techniques and development strategy, which not only produced high yields in wide application but also succeeded in ensuring China's population stayed fed.

Yuan shared his techniques with his counterparts in the United States and India and lectured in over 30 countries and regions in Asia, Africa, and Latin America.

On November 3, 1987, the UNESCO granted him the Science Prize of the year at its headquarters in Paris, citing his scientific and technological achievements as the "second green revolution" after semi-dwarf rice developed in the early 1970s. In 2004, Yuan Longping took the World Food Prize for his outstanding contribution to providing nutritious, sufficient food to the mankind.

In April 2006, Yuan Longping was made a foreign academician of the United States National Academy of Sciences.

November 2, 2015: Nanjing 5055, a species of "super rice" growing in Taizhou, Jiangsu Province. Chinese scientists are working hard to reach the latest target: 1,130 kilograms per *mu*, or 17 tons per hectare. VCG

August 2014: Yuan Longping, a key figure in the successful breeding of hybrid rice in the East, has been hailed the "Father of Hybrid Rice in China." VCG

# Anywhere and Everywhere

**Edited by Hu Zhoumeng**

If you end up stranded on a deserted island today, hopefully your mobile phone still has power as well as the BeiDou Navigation Satellite System (BDS) app. With it, a castaway could send a "help" message to anyone within a hundred-mile radius.

China's homegrown BDS features integrated functions of communication, location, time service and navigational guide. Stanford Professor Bradford Parkinson, considered the Father of the Global Positioning System (GPS), even noted that BeiDou's unique design provides a wonderful experience of knowing where you are as well as anyone else.

## Late Start

China started building its own satellite navigation system in 2000 by sending orbiters into space to build a double-satellite experimental positioning system. The system, known as BeiDou-1, was only intended for domestic service. By the end of 2012, China had completed the BeiDou-2 system which expanded service to the Asia-Pacific region with 32 ground stations and 14 networking satellites, including five Geostationary Earth Orbit (GEO) satellites, five Inclined Geosynchronous Satellite Orbit (IGSO) satellites and four Medium Earth Orbit (MEO) satellites. Plans call for the BeiDou-3 system to accomplish constellation deployment with 35 satellites, including five GEO and 30 non-GEO satellites, to provide global service by 2020.

BDS, born decades later than the United States' pioneering GPS, has become one of the four members of the Global Navigation Satellite System (GNSS) club alongside Russia's GLONASS and the European Union's Galileo. Like its peers, BDS provides two types of service: open service for the public and restricted service for the military. The public service is free, with location-tracking accuracy within 10 meters and time synchronization within 10 nanoseconds.

China aims to strengthen international cooperation with other countries and organizations, and enhance the BDS compatibility with other satellite systems to benefit global users. China and the United States have been working towards GPS-BDS compatibility for years in fields like aviation. "Landing a plane in pea-soup fog conditions is pretty impressive," remarked Tom Langenstein, executive director of the Stanford Center for Position, Navigation and Time. "It's a nice area of cooperation between our countries."

## Booming Business

Many in China were introduced to BDS when it offered remarkable assistance to rescue efforts after the massive Wenchuan earthquake in 2008. The technology proved incredibly helpful in performing disaster relief. BDS can also be quite useful in fields such as wildlife protection and oceanic fishing, realms in which communication has previously been difficult and expensive.

Aided by ground stations across the country, BDS is improving accuracy to the centimeter regardless of atmospheric changes. "The National BeiDou Precision Service Network covers 317 cities across the country so far, and can provide precise location information, accurate time information and short-message communication service in almost every area," noted Miao Qianjun, secretary-general of the Global Navigation Satellite System and Location Based Service Association of China.

BDS is shaping everyday life in China with increasingly wide application. For infrastructure, it helps position underground gas and power lines, and monitor deterioration of bridges, highways and dams. In agriculture, the navigation system greatly improves farming efficiency by guiding operations of agricultural machinery. In transportation, the population of vehicles equipped with BDS is rising, and bike-sharing companies Ofo and Mobike have become its customers.

Data has indicated that the output value of China's satellite navigation and locating services totaled around US$31 billion in 2016, with BDS contributing over 30 percent. That number is predicted to hit US$59 billion in 2020.

"The application of aerospace science to improve people's livelihood is tremendously important," noted Sun Jiadong, 88-year-old chief designer of BDS.

September 30, 2015: China launches a new-generation satellite aboard the Long March-3B carrier rocket, the 20th satellite for the BeiDou Navigation Satellite System, from the Xichang Satellite Launch Center in the southwestern province of Sichuan. by Li Xiang/Xinhua

January 14, 2017: Sun Jiadong, chief designer of BDS, wins the annual "Touching China" award that honors ten of the country's inspirational role models. IC

April 24, 2017: A model of China's homegrown BDS is exhibited at Northwestern Polytechnical University in Xi'an, Shaanxi Province. VCG

# Jiaolong under the Sea

**Edited by Yin Xing**

On June 23, 2017, China's Jiaolong manned deep-sea submersible and its mother ship Xiangyanghong 09 returned to the National Deep-Sea Base in Qingdao, Shandong Province, bringing the nation's 38th oceanic expedition and the submersible's five-year trial run to an end. During the 138-day expedition, Xiangyanghong 09 sailed 18,302 nautical miles through the South China Sea, northwestern Indian Ocean and northwestern Pacific Ocean.

## World's Deepest Dive

Named after a mythical dragon, Jiaolong is China's first homegrown manned deep-sea research submersible, making China the fifth country with deep-sea exploration technology, after the United States, France, Russia and Japan. It can carry three people and cover 99.8 percent of the world's underwater area. During a test dive in June 2012, Jiaolong reached its deepest depth, 7,062 meters, which is the deepest depth reached by a submersible of its kind. In January 2013, the submersible began a five-year trial run, during which time it made 152 dives in seven marine zones around the world and collected precious data as well as geological and biological samples.


Xu Qinan (left), chief designer of China's Jiaolong manned deep-sea submersible, visits Taizhou Institute of Science and Technology under Nanjing University of Science and Technology. IC

About 90 manned submersibles are currently in service worldwide, 12 of which can reach a 1,000-meter-depth. The five leading countries in deep-sea exploration all have submersibles capable of diving 6,000 meters deep. Japan once held the diving depth record with 6,527 meters.

## Father of Jiaolong

In 2002, China's Ministry of Science and Technology launched a project to build a manned submersible capable of diving 7,000 meters deep. Almost every expert nominated Xu Qinan to serve as its chief designer. Xu was a founding member of China's deep-sea submersible program and successively served as deputy chief designer or chief designer of the country's five submersibles, manned and unmanned.

But Xu had already been retired from China Shipbuilding Industry Corp, one of China's major state-owned shipbuilders, for six years by then. When the company invited him to take the position, Xu was eager to get back to work, but his family objected because Xu was suffering from heart problems, high blood pressure, headaches and partial blindness in one eye. "I have been working on developing a 7,000-meter diving device since 1992," pleaded Xu. "It's my dream. I can do it."

Xu was 66 at the time, which was beyond the project's age limit of 55. But China's Ministry of Science and Technology made an exception for him.

Across the following decade, Xu and his team overcame many difficulties to continuously set new records for Chinese submersible depth. When Jiaolong conducted its first trial run, Xu insisted on being aboard its mother ship, even lugging a suitcase of drugs and healthcare equipment such as an oxygen machine and blood pressure monitors. Every time Jiaolong dove, rather than wait in the command room, he would sit in the control cabinet to look at the sea and wait for responses from the divers—only a dozen sentences in several hours. He didn't want to miss a word. "I am tired, but I am happy," remarked Xu.

Today, 81-year-old Xu no longer manages any work, but the team he built and the professionals he trained continue to carry his torch.

June 23, 2017: China's Jiaolong manned deep-sea submersible, its mother ship and 96 crew members arrive at the National Deep-sea Base in Qingdao, Shandong Province. VCG

China's Jiaolong manned deep-sea submersible at its mother ship Xiangyanghong 09 after finishing the nation's 38th oceanic expedition. VCG

# Longest Span Across the Sea

**Edited by Zhou Xin**

With a length of 55 kilometers and a cost of over 100 billion yuan (about US$14.9 billion), the ongoing construction project of the Hong Kong-Zhuhai-Macao Bridge has been hailed by *The Guardian* as one of the "Seven Wonders of the Modern World." As a major infrastructure project connecting Hong Kong, Macao and Zhuhai, a city in Guangdong Province, it is key to the high-speed road network across the Pearl River Delta area around the Lingding Channel.

Construction of the longest steel bridge across the sea started in 2009 and is expected to be completed in December 2017. The Lingding Channel is an important route for marine transportation surrounded by a cluster of busy airports. A bridge across the water would pose a problem for air and maritime transportation in this area. So the team came up with the novel plan of a combination of bridge and underwater tunnel, an ideal but difficult way to solve the problem. According to the plan, parts of the project will go above the sea, and other parts below.

As designed, the bridge should have an anticipated lifespan of about 120 years. To meet this requirement, 420,000 tons of steel were used to make the girders. The strong bridge is designed to resist super typhoons and earthquakes of up to magnitude-8. When completed, the project is expected to reduce automobile travel time between Hong Kong and Zhuhai or Macao to approximately 40 minutes, down from 4.5 hours at present.

The construction team has overcome many problems, including the complexity of the seabed, harsh environment and the incredible length. The construction team headed by Lin Ming, general manager and chief engineer of the project, has forged ahead to solve emerging problems and make the mega bridge the highest quality the world has ever seen. Lin and his team held hundreds of meetings every year, many of which lasted all night. To save time, he often scheduled meetings during trips, sometimes even at the airport.

He is considered a brave and responsible leader. The underwater sections require workers to work as low as 50 meters below the Pearl River. Even the tiniest mistake could cause water to gush into the work site, leaving workers with nowhere to escape, so everyone was hesitant to start work. Lin solved this problem by sitting on a bench at the construction site. "The safety of the work site had been proved several times by experts," he told the workers. "I'll stay with you while you work down here."

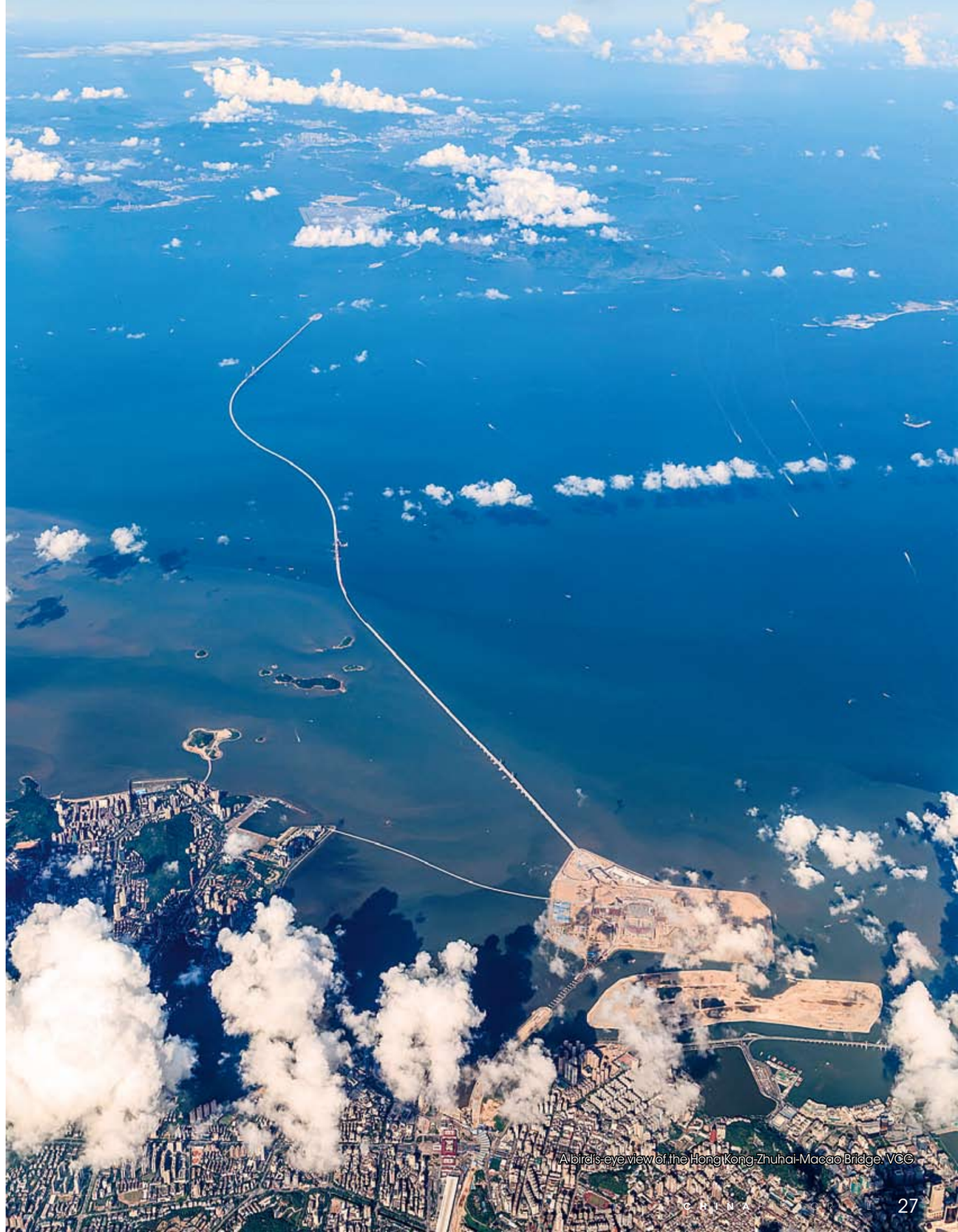
Because building subsea tunnels in open waters is so difficult, Lin set strict rules for construction. His requirements for the standards far exceeded domestic regulations. At any given time, he could usually be found at the construction site. Any problems he found were discussed and solved immediately. Furthermore, he showed consistent concern for his employees' well-being. Lin is the only member of the team who has never taken holidays. He spends every weekend and festival at construction sites with workers who remain on duty.

The magnificent bridge, built with Chinese wisdom and bravery, will further promote the regional economy and make residents' lives more convenient.

June 2, 2016: The last steel tower of the Hong Kong-Zhuhai-Macao Bridge is installed. by Chen Xianyao/VCG

July 5, 2017: The eastern artificial island of the Hong Kong-Zhuhai-Macao Bridge project. by Chen Jimin/VCG

July 7, 2017: Both sides of the subsea tunnel of the Hong Kong-Zhuhai-Macao Bridge break through to meet. by Chen Jimin/VCG



A bird's-eye view of the Hong Kong-Zhuhai-Macao Bridge. VCG

# Smart Medical Treatment

**Edited by Zhou Xin**

From big data, cloud computing and artificial intelligence to the mobile internet, new technologies are transforming almost every facet of daily life. Medical treatment is a crucial need for everyone. What will healthcare be like in the future? China is exploring the possibilities for innovation.

Generally, smart medical treatment falls into a handful of categories. Firstly, the technology of big data is being used in the medical sector. In 2015, China's State Council issued a framework plan of national medical treatment service system for next 6 years (2015-2020). According to the plan, China will set up a national electronic healthcare and medical history database. The database will greatly enhance hospital management and analysis of medical situations of the whole population. Secondly, hospitals are getting smarter. Chinese woes related to medical treatment are partly caused by inefficient and low-quality medical services. Hospitals in China are implementing pilot projects to build smart hospitals. They have launched mobile platforms and provided online services to patients, bringing dramatic changes to previous processes. Thirdly, new technologies are being applied in medical treatment. Advanced technologies related to artificial intelligence such as the smart speech recognition system and smart medical image detection are flourishing and helping medical treatment. Machines are sometimes more accurate than even the most experienced doctors. Fourthly, advanced biological technologies are being applied to the research and development of new medicines.

The thriving industry has been propelled by many pioneers. Yu Jianfeng, CEO of Zhuojian Tech, is a doctor in the First Affiliated Hospital of Zhejiang University. Amazed by the attractive future of smart medical treatment, he started his own company in 2011. Now its products provide online medical consultation and diagnoses, create mobile hospitals and provide online medical training. "Mobile hospital" refers to an app through which patients can make an appointment, find where to go, check test results and make payments. All of these processes can now be completed on a smartphone. On the doctor version of the app, the doctor can make diagnoses, search for the medical knowledge they need, check and change shifts, arrange and manage their patients and more. Yu's goal is to make as many medical services as possible fit in your hand.

Many leading innovators in artificial intelligence are also eyeing and cashing in on smart medical treatment. For instance, iFlytek, a company renowned for its advanced technology in speech recognition, is applying its technology in hospitals. It has created software to filter noise, transcribe doctors' discussions with patients and send doctors the medical literature they need to make their work easier. When doctors' hands are occupied such as during a surgery, they can use the device developed by iFlytek to record voice and produce automated notes. Moreover, the company's software also organizes recordings and produces standard patient history.

This promising sector is attracting greater attention. With surging ideas and cutting-edge technologies, medical treatment will soon become more convenient, cheaper and healthier overall.


March 22, 2017: A smart guide robot begins offering service in the Chinese PLA General Hospital. VCG


July 3, 2017: Residents make payments with their social security cards at a self-service terminal in a hospital in Ningbo City, Zhejiang Province. VCG

# Exploring the Universe with "Eye of Heaven"

**Edited by Li Zhuoxi**

Humans have fantasized about extraterrestrial life since ancient times.

On September 25, 2016, in a karst valley in Qiannan Buyei and Miao Autonomous Prefecture in southwestern China's Guizhou Province, the Five-hundred-meter Aperture Spherical Telescope (FAST) was officially launched to explore the secrets of outer space.

## Multiple Missions

Ordinary astronomical telescopes are optical, which means they can only gather and focus visible light from other astronomical objects. However, many radio waves from astronomical radio sources are not visible to the human eye, but can be detected otherwise. The primary observational instrument of radio astronomy, a radio telescope is a specialized antenna and radio receiver used to capture radio waves.

Dubbed the "Eye of Heaven" in China, the nearly 1.2-billion-yuan (about US$180 million) FAST project took 22 years from preparatory research to completion, after it was proposed by Chinese astronomers in 1994. Constructed by the National Astronomical Observatories of China under the Chinese Academy of Sciences, the telescope's main structure is as large as 30 football fields. FAST is the world's largest and most sensitive radio telescope, and China holds the intellectual property rights to it.

FAST has reason to be proud. Upon completion, the telescope's comprehensive properties dwarfed Puerto Rico's Arecibo Observatory exponentially. It is 10 times more sensitive than the steerable 100-meter telescope near Bonn, Germany. Theoretically speaking, FAST can sense electromagnetic signals from 13.7 billion light years away, a distance close to the edge of the visible universe.

FAST also shoulders major scientific research missions. Its super sensitivity and detection ability of pulsars' gravitational waves are conducive to space exploration, researching the origins of the universe and searching for signs of intelligent life. FAST's major functions include seeking and researching pulsars and searching for alien life.

## Father of FAST

Many industry insiders believe that FAST would not exist without Nan Rendong.

Nan Rendong, chief scientist of the FAST project and a researcher with the National Astronomical Observatories of China, considers FAST his baby as well. From early preparations to completion, Nan was involved for all 22 years.

In April 1994, site surveying for the FAST project started. At that time, Nan and his colleagues began more than a decade of preparatory research. To find the most suitable place in the mountains of Guizhou to construct and install a 500-meter aperture spherical telescope, Nan visited more than 100 funnel-shaped naturally formed pits from 1994 to 2005. In those days, this was a monumental task because of poor road conditions. They returned to town at night and set out again the next day. Back then, many people in the mountainous areas knew Nan.

After the preliminary field investigation, many members of the team returned to their old jobs, but Nan continued traveling around China. To seek technological cooperation, he took a train from Harbin Institute of Technology in northeastern China to Tongji University in eastern China, and then to Xidian University in northwestern China. He also attended many international conferences and talked to everyone he met there about the FAST project. "I began to be very nice to everyone, hoping to get more global support for the project," grins Nan.

FAST is now exploring the secrets of the universe. According to CNN reports, the massive engineering and scientific project is considered a major step in humanity's quest to determine whether we are alone in the universe. The device has the potential to change our understanding of the universe and ideas about life on other planets.

June 23, 2016: The central part of the FAST project is about to be completed. VCG

July 3, 2016: The last reflecting surface of FAST, the largest single-aperture radio telescope in the world, has been successfully installed, marking the completion of the central part of the FAST project. VCG

# Birth of China's Quantum Computer

**Edited by Li Zhuoxi**

The notion of a quantum computer is already well-worn territory in science-fiction literature and movies, and reality is finally catching up.

On May 3, 2017, in Shanghai, the Center for Excellence in Quantum Information and Quantum Physics under the Chinese Academy of Sciences (CAS) announced that China had constructed the world's first quantum computer based on single photons that goes beyond the early classical computer, a development that could turn traditional computing upside down.

Professor Pan Jianwei, a renowned Chinese physicist and a CAS academician, led the project. "The things we may one day be able to do with quantum computing are beyond our imagination," he says. "China is getting closer to the critical shift from quantitative change to qualitative change in its quantum computing research."

## Beating the Most Powerful Supercomputer

What exactly is a quantum computer?

In physics, a quantum is the minimum amount of any physical entity to be involved in an interaction. All microscopic particles, including molecule, atom, electron and photon, emit different forms of quantum. From CD players to massive fiber-optic communication systems, magnetic resonance imaging machines in hospitals and scanning tunneling microscopes, quantum technology has gradually penetrated every aspect of daily life.

An early classical computer has memory made of bits defined as either a one or a zero. However, a quantum computer is a computation system that makes direct use of quantum-mechanical phenomena to perform operations on data, which is much faster. For example, factorizing a 300-digit number, a task that would take an early classical computer 150,000 years, can be accomplished by a quantum computer in one second.

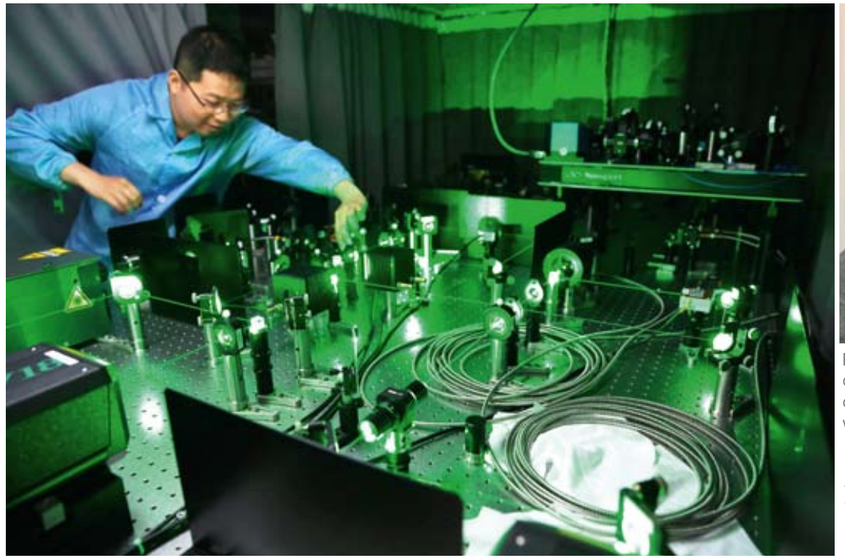
"China's current quantum computer model uses ten qubits," reveals Pan. "However, with 50 qubits, it could beat the fastest supercomputer in terms of processing some specific problems." He compares today's quantum computers with early classical computers because "our quantum computer is only a 'kid', so it's only fair to compare it to other kids." Pan's team plans to build a model with 20 qubits by the end of 2017, and its computing capacity is expected to surpass that of the fastest laptop on the market.

## Nobel-Ready Chinese Scientist

Pan, a leading Chinese quantum physicist, is clearly a key figure in the country's quantum computer project.

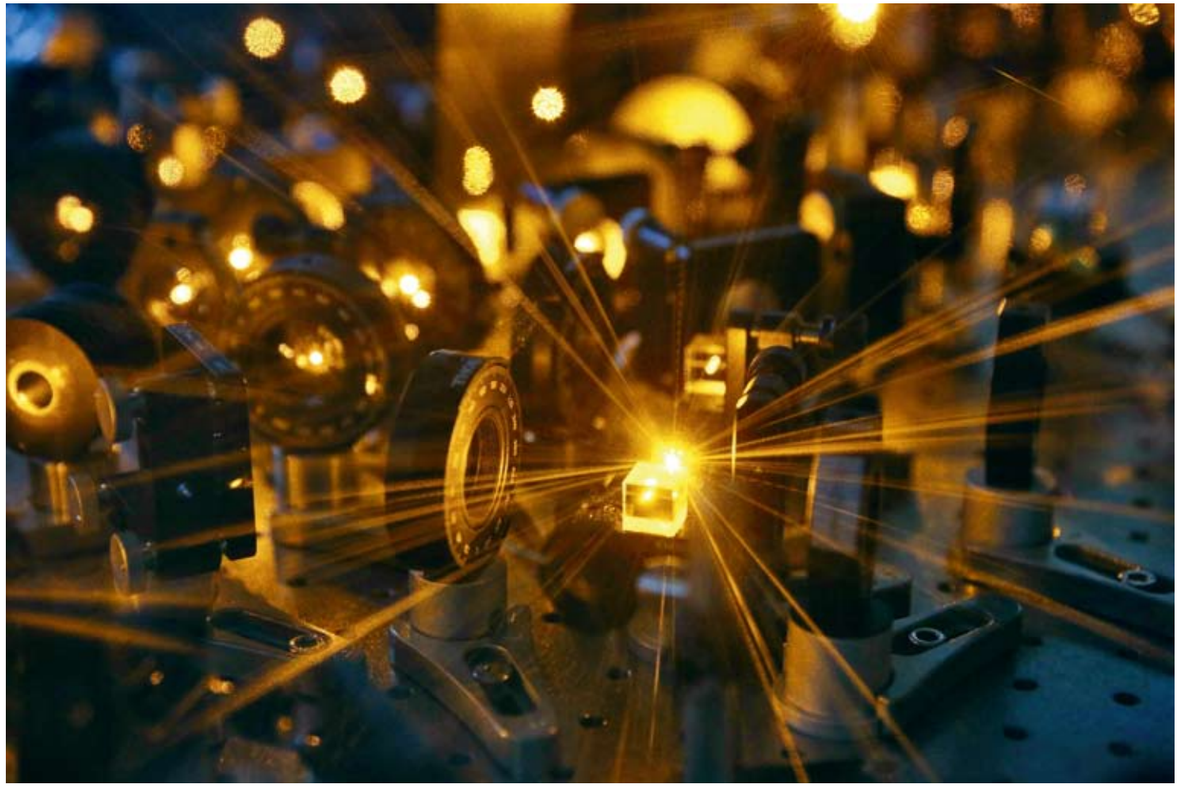
Pan is a science legend in the eyes of many. At 29, he co-authored an article about quantum teleportation that was selected by the international academic journal *Nature* as one of 21 classic papers for physics over the past century alongside the discovery of the X-ray by Wilhelm Roentgen (1845-1923) and the development of the Theory of Relativity by Albert Einstein (1879-1955). At 31, he was appointed professor at the Hefei-based University of Science and Technology of China (USTC). At 41, he was elected a CAS academician, the youngest academician in China at that time. At 45, he won the first prize of National Natural Science Awards, China's highest science award which has been granted to top scientists including Hua Luogeng, Wu Wenjun, and Qian Xuesen. Some even think Pan came close to winning the Nobel Prize ten years ago.

In the field of superconducting quantum computation, China has no first mover advantage and lacks professionals. Concerned about this situation, Pan sent students with diverse academic backgrounds to study in Austria, Germany, Switzerland, the United Kingdom and the United States and later "brought" them back. This ensured that his team had the most advanced knowledge in specialties such as cold atoms, precision measurement and multiphoton entanglement manipulation. In recent years, the team's research has been published in many renowned international periodicals including *Nature* and *Science*.



Pan Jianwei leads construction of the first quantum computer in the world. Ten years ago, some believed that he was close to winning the Nobel Prize. VCG

A bare-bones quantum computer, which takes up less than three square meters. VCG



The quantum computing platform in the ultra-cold polar molecular lab at the USTC Shanghai Institute for Advanced Studies. VCG

# C919 Cleared for Takeoff

**Edited by Yin Xing**

China's first domestically produced large passenger plane, the C919, successfully completed its maiden flight in May 2017. It took six years for the plane to be certified since its debut in 2008.

## Strong Competitor

The flight makes China the fourth jumbo jet producer after the United States, Europe and Russia. It also marks a milestone for the Commercial Aircraft Corp of China (COMAC), the Shanghai-based manufacturer of the C919.

The twin-engine single-aisle C919 seats 158 or 174 and will be used for medium-haul flights in the commercial market. Commercialization of the C919 will take two to three years, and demand for the C919 in the domestic market is expected to reach at least 2,000.

The COMAC has already received 570 orders for the C919 from 23 clients including large domestic carriers such as Air China, China Southern Airlines, China Eastern Airlines, Hainan Airlines and Sichuan Airlines.

Shaking the dominance of giants Boeing and Airbus in the near future is unrealistic, but the Chinese jetliner could become an attractive option for global carriers in decades to come. "I think by 2030 or 2035, the COMAC may very well build planes strong enough to compete with Airbus and Boeing," said Michel Merluzeau, director of Aerospace & Defence Market Analysis for AirInsightResearch in Seattle.

## Chief Designer

With the successful maiden flight of the C919, its chief designer, Wu Guanghui, came under the spotlight. "Our country needs us. I just did what I should do," he said.

In 2005, Wu shifted the focus of his work from military planes to passenger jet ARJ21, China's first domestic commercial regional aircraft. In 2012, ARJ21 successfully made its maiden flight, which accumulated a lot of experiences for the design of the C919.

In May 2008, Wu was appointed vice president of the COMAC and chief designer of the C919. After communicating with his counterparts from France, Germany and the United States, Wu felt great pressure. Facing the domestic weak base and international block and monopoly of technology, Wu and his team had to feel their way forward.

"We had to design aerodynamic force, from wings, body to the whole plane, from calculating to distribution tests," recalled Wu. "We had to produce a more advanced type, otherwise we would not have the advantage and competitiveness in the market. We didn't have any experience alike. We had to decide how to organize and push the whole project forward."

Wu and his team, after a theoretical argument, began to collect professionals nationwide. Researchers from aviation colleges set up a project team of large-scale passenger jet, brainstorming a master plan for the design of the plane. And they compared high-end aircraft design plans in today's world to incorporate their merits. The team highlighted the new plane's security, economy and amenity as well as its environmentally friendly quality to meet the international standards and even outperform other planes of its kind.

In order to complete their goal, Wu and his team set up a working model: 11 hours a day and seven days a week. And at key phases, they worked in shifts for 24 hours a day. For Wu himself, he always stayed at work without any weekends and holidays. "We can't allow any errors at any point," Wu always reminded himself. "We have to move steadfastly."

Wu gave the credit to his team. "In the design, manufacturing and trial flight, young people have played a key role," he said. "The average age of our research team is young, and 75 percent of its members are under 35 years old, so I have the reason to believe China's aviation cause has a brighter future."

A flying C919 in the lens of a photographer in an accompanying plane. by Wan Quan

A C919 rolls off the final assembly line in February 2017. by Wan Quan

# China's Next-Gen Bullet Trains

**Edited by Gong Haiying**

Ever since China began building its first high-speed railway in 2004, the country's high-speed rail construction has developed rapidly. In 2016, four major high-speed rail lines opened, expanding the total length of China's high-speed rail network to more than 22,000 kilometers, top in the world. In April of this year, high-speed rails were rated the best of the "four innovations of modern China" that are the most appealing to youths from 20 countries involved in the Belt and Road Initiative. High-speed rails are becoming a "Chinese specialty" that many foreign youngsters want to sample.

At 11:05 a.m. on June 26, 2017, two newly developed electric multiple unit (EMU) trains, named Fuxing (literally, "rejuvenation"), were officially launched on the Beijing-Shanghai high-speed railway.

The Fuxing train, to which China possesses complete intellectual property rights, is a new model following the CRH model.

Lu Dongfu, general manager of China Railway Corp, believes that "the launch of the new bullet trains means China's high-speed trains make a major leap forward in the country's push to become a global tech power."

June 26, 2017: Fuxing train G123 ready to depart from Beijing South Railway Station. The model is one of the most cutting-edge bullet trains in the world, and China holds its intellectual property rights. by Ju Huanzong/Xinhua

## How Great Are the New Bullet Trains?

First, the EMU trains received a speed-boost. The number "400" in the official names of the two Fuxing models, CR400AF and CR400BF, indicates that the trains typically travel at speeds of around 350 kilometers per hour but can reach 400 kilometers per hour, an increase of 150 and 50 kilometers per hour compared to the CRH model.

Second, the EMU trains widely adopted Chinese standards. They are built according to a number of technical standards including unified Chinese standards, railway industry standards and requirements of the China Railway Corp, with Chinese standards covering 84 percent of all requirements. Independent development of the new technologies in the trains, including overall design and every key component, has left China in control of the intellectual property rights. And every track leads to greater connectivity.

Third, the new trains provide better security. To guarantee safety, the Fuxing model brings its own "doctor" along on every trip. The new model has a powerful safety monitoring system with more than 2,500 sensors. The sensors monitor the state of the entire train, and if something ever goes wrong, the monitoring system sounds an alarm and can even take automatic measures such as reducing speed or even stopping the train. An energy absorption device to diminish collisions is placed at the joint of the locomotive and carriages of the train. The device can passively protect the train completely in the event of a low-speed collision.

The Fuxing model also adopts a new streamlined body design with lower air resistance that reduces power consumption. The height of the train was increased to give more room to passengers and the air conditioning system was enhanced to adapt to various exterior air pressure conditions and reduce ear discomfort when trains pass through tunnels or pass each other, making the trip more comfortable for passengers.

## Development of China's High-Speed Rails

Before China's high-speed trains were launched, the speed of the Chinese railway system had increased five times. The launch of high-speed bullet trains was considered the sixth speed boost. He Huawu, chief engineer of the China Railway Signal & Communication Corp, oversaw the sixth speed improvement. He organized research to tackle key technological problems and optimize system integration, which provided strong technical support for the construction of the high-speed rail system. He witnessed the entire development process of Chinese high-speed trains.

June 26, 2017: A Fuxing train sets off from Beijing South Railway Station, the north terminal of the Beijing-Shanghai High-speed Railway. by Xing Guangli/Xinhua

According to He, the development of China's high-speed trains roughly fell into three stages. The first stage began in 2006, when foreign technologies from Japan, France, Germany and other countries were introduced to China, which were then absorbed and renovated. In 2008, the first CRH train, which traveled at a speed of 350 kilometers per hour, took its first test run. The second stage started in 2009, when China designed and manufactured the second-generation high-speed trains with independent research and development. The new CRH model set a record of 486.1 kilometers per hour in a trial run along the Beijing-Shanghai line in 2010. The third stage is the launch of the EMU trains. In July 2017, two Chinese-designed bullet trains passed in opposite directions at a world-record speed of 420 kilometers per hour during a test run.

According to the *Medium- and Long-term Railway Network Plan* issued on July 22, 2016, China's high-speed railway network will reach 38,000 kilometers by 2025, linking 240 medium-sized and large cities in the country.

As *The New York Times* commented, "China's ambitious rail rollout is helping integrate the economy of this sprawling, populous nation, and is bringing to China the very real economic benefits."

# Moon Missions

**Edited by Hu Zhoumeng**

The moon has maintained a central role in Chinese culture since ancient times. Not only has it inspired numerous poets, but also generated timeless myths and legends, the most famous of which is about a beauty named Chang'e who resides on the moon with a jade rabbit and her husband Houyi, who shot down nine of ten suns.

Far from ancient imagination, world scientists have been pouring resources into solving mysteries of the ball of rock 239,000 miles from Earth, hoping to gain a deeper understanding of the only natural satellite of Earth and devise ways to exploit it. Chinese experts have played a big role with a mission named after Chang'e.

## Closer Touch

China launched two lunar orbiters, Chang'e-1 in 2007 and Chang'e-2 in 2010. With the Chang'e-3 mission in 2013, China became the third country, after the former Soviet Union and the United States, to soft land on the surface of the moon. Later this year, the heavy-lift carrier rocket Long March-5 is supposed to take the Chang'e-5 lunar probe to space from the Wenchang Space Launch Center on southern China's Hainan Island. Liftoff will herald the dawn of the third phase of China's lunar program: Return after orbiting and landing.

The Chang'e-5 probe, designed by the Chinese Academy of Space Technology, is China's first unmanned spacecraft designed to perform lunar sampling. It will make China the third country to bring lunar samples to Earth and the first in over four decades since the former Soviet Union's Luna-24 mission in 1976. The Chang'e-5 mission could be tremendously significant for science and serve as a valuable test for future manned lunar missions.

The return of the Chang'e-5 probe requires delicate coordination between four systems that comprise the eight-ton vehicle: an orbiter, a returner, an ascender and a lander. The lander will put moon samples in a vessel in the ascender after the moon landing. Then the ascender will take off from the moon, dock with the orbiter and then transfer samples to the return module. The orbiter and returner will then head back to Earth. Finally, the returner will re-enter the atmosphere.

The mission will mark several firsts in China's lunar program upon completion: first automated moon surface sampling, first moon take-off, first unmanned docking in lunar orbit about 380,000 kilometers from Earth and first return flight at a speed near second cosmic velocity, notes China Aerospace Science and Technology Corporation (CASC).

China also plans to launch the Chang'e-4 lunar probe around 2018 to achieve mankind's first soft landing on the dark side of the moon and conduct roving detection and relay communications at Earth-moon L2 point, according to the China National Space Administration.

## Mining Treasure

Chinese lunar knowledge can be traced back to the days when farmers changed their activities according to the moon's phases to improve agricultural harvests.

Over centuries, abundant scientific work helpful to humankind has been achieved thanks to lunar exploration. Decades ago, the United States made an early move with NASA's US$25.4-billion Apollo program that produced multiple new technologies for aerospace, military, material and communication sciences.

As the Chang'e missions have been implemented, China has generated new knowledge with updated full-moon images and geological and 3D topographic maps. Its research on lunar soil and spatial environment also produced fascinating results.

These days, a lunar probe is expected to offer solutions for humans to battle climate change and explore new energy. "The moon's surface is a rich pool of Helium-3, a good source of clean energy that could meet the world's energy demands for generations," remarked Ouyang Ziyuan, chief scientist of China's lunar probe program. "Lunar probes could help solve energy problems, and it is the shared responsibility of the world's scientific community to work towards that end."

"International cooperation always enhances the capabilities of both agencies, which is again the case for our long-term cooperation with China in the area of tracking and operations," said Paolo Ferri, head of the Mission Operations Department at the European Space Operations Centre. The European Space Agency offered support to the Chang'e missions. Further cooperation between China and European countries including German, France, Sweden and the Netherlands is in the works.

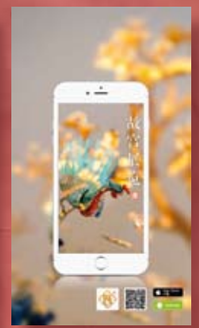
November 1, 2014: Chang'e-5 T1's Earth re-entry module lands safely in a designated area of the Inner Mongolia Autonomous Region, marking the success of the re-entry flight test as part of the third phase of China's lunar probe program. VCG


May 23, 2017: Visitors look at a model of the Chang'e-5 probe at a scientific exhibition in Beijing. IC

# Palace in Your Pocket

**Text by Wang Yuncong**
**Photographs by Guo Shasha**

Works of the digital media crew of the Palace Museum.

Many people get the chance to admire the Palace Museum (Forbidden City) in person, but no one gets to build their own mansion there, redesign the royal garden and revive the brush used by Emperor Qianlong of the Qing Dynasty (1644-1911). Today, however, a mobile app named the "Palace Museum Community" can make each of these dreams come true after a virtual city based on the architectural style of the Palace Museum went online in May 2017.

The Forbidden City served as the royal palace for emperors of the Ming (1368-1644) and Qing dynasties. It was renovated into the Palace Museum and opened to the public in 1925. After centuries of rises and falls, the royal building complex has been injected with new vitality via the internet. It is now reinvigorated and closer to ordinary people. What influenced this development?

Members of the digital media crew working in planning, distribution, operation and maintenance of the network media including the official website, microblog, WeChat and mobile apps of the Palace Museum.

## "Part of Our Lives"

The office of the new media team of the Palace Museum is located in the former "kitchen" of Shoukanggong, or the Hall of Longevity and Good Health, in the museum. Like other offices, it is filled with computers and loads of files and books, but the original structure is all protected with boards.

The Palace Museum's official Weibo (Chinese version of Twitter) account has attracted millions of netizens. The account is even more popular than one might expect, which is exactly what Guo Ting and his teammates hoped.

"We have been tweeting about the Palace Museum since Weibo first arrived on the scene," asserted team leader Guo Ting. "When microblogging first became popular in 2010, we were right there. The classic Palace Museum has been able to continue offering fresh looks."

Its official Weibo account was launched as a window for anyone who wanted to learn more about China's Palace Museum and to showcase the extensive collection of the royal families. The new media era has created many more ways to touch the public than dry textbook readings.

The team's painstaking efforts have produced vivid, poetic pictures featuring a strong aura of the Palace Museum. They divided posts into topics such as "Bright and Beautiful Spring," "Cool Summer," "Brilliant Autumn," and "Warm Winter." Massive amounts of photos of the Forbidden City from new angles are also posted online regularly.

"We want to make the Palace Museum a lifestyle," explains Guo. "We hoped to make our digital work and social platform part of people's lives, so that the royal life becomes 'common'. That's what we've been striving for."


Over the last few years, the Palace Museum's cultural and creative products have proved tremendously popular. Its official flagship store at Taobao.com has been a favorite of netizens.

## A Small Incision

The team mapped out new plans for its own mobile app in the second half of 2012 as apps became all the rage. The arrival of Zhuang Ying, who has worked for the Palace Museum since 2008 as an editor of its English website, was a game changer.

"After graduation, I thought I'd take a shot at the job of English editor here and applied," recalls Zhuang, who majored in American culture in college. "Like many people, I had no idea what it would be to work with the Palace Museum. Some of my relatives assumed I had been hired as a tour guide. I got inspired to show everyone the most hidden corners of the Palace Museum and the most stunning pieces in its collection. I could feel that mobile digital media was the best way to make it happen."

As mobile media became more popular, many museums introduced apps to guide visitors, but not the Palace Museum. "We did a lot of research and decided that a guide app would be a daunting task with so many variables," explains Zhuang. "Despite the fact that everyone else was doing it, we opted to first make an app that recommended pieces in our collections and then go deeper from there."

It didn't take long. In May 2013, the Palace Museum debuted "Yinzhen's Beauties," an app focused on 12 fine brushwork lady paintings from the Qing Dynasty. The app illuminated royal Qing life through presentations on tea-tasting, reading, meditation and butterfly admiration as well as interior decoration and table setting.

During research and development, Zhuang Ying hunted for so many materials that books were usually piled a meter high on her desk. She dug through details on names, times and context that the app needed, each of which was crosschecked by experts of relevant sectors, including makeup, jewelry, ceramics and clocks. She made special visits to retirees like Hu Desheng, a specialist in ancient Chinese furniture, and Wang Lianqi, an expert on ancient Chinese calligraphy and painting. The former contributed captions for the furniture as well as utensils and the latter conducted textual research for the hanging scrolls and poems in the background.

Such thorough research ultimately resulted in just more than 1,000 Chinese characters that made it to the app.

While the app "Yinzhen's Beauties" was in development, Zhuang invited experts to review it, who argued fiercely on topics such as the material used for the monk-hat pot in a painting. Even details that couldn't possibly matter to most people constantly ate at her. Zhuang felt it was her duty to provide expert-confirmed authenticity to do justice to both the museum and users.

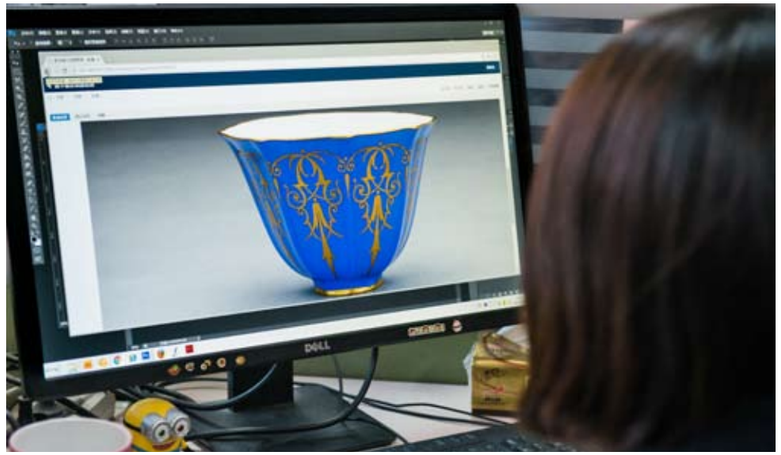
"We spent more than a year on the app before it was released," Zhuang notes. "We couldn't release shoddy work because we're representing the Palace Museum, which is the essence of traditional Chinese culture and a living testament to its most supreme aesthetics."

The app saw 200,000 downloads two weeks after its release, and was cited as one of China's Best Apps of 2013 by Apple Store.

## "Falling in Love"

Photography is closely intertwined with new media. In 2014, Zhang Lin was hired as a photographer by the Palace Museum after he graduated from the Archaeological Department of Peking University. He oversees operations of the Micro Palace Museum, and many of his photos touch hearts.

"I studied archaeology of the Shang and Zhou dynasties (1600-221 B.C.) in college," he explains. "My knowledge of the Ming and Qing dynasties was so poor that I could hardly name the Ming emperors.



The digital team has always been inspired by the rich collection of the Palace Museum.

Soon after I started my career in the Palace Museum, I became immersed in that period of history and fascinated by the many places in the imperial architectural complex that remain unknown to the public."

"My early work here was bad," Zhang grimaces. "I took photos based on my naive understanding of the subjects. I thought the 600-year-old royal palace represented a sense of loss, so I focused on the dingy corners. After talking extensively with my seniors, I realized that history and nostalgia are not all that the Palace Museum has."

Soon, he started posting photos online that refreshed the time-honored glory with modern appeal: the magnolia blooming in spring, the fish and water lilies in summer, the golden falling leaves in autumn, and the silvery structures in winter.

In his three years there, Zhang has shot every corner of the Palace Museum, but his most popular shots are of a snowy scene in 2015. It had just snowed all night. The next day was a bright Monday, when the museum was closed to the public. Zhang and another photographer requested to enter the museum to take photos of the three great halls. "It was just us two looking down from the Gate of Supreme Harmony," recalls Zhang. "It was gorgeous: The square of the Hall of Supreme Harmony was glimmered in the sunlight."

Two of his snowy photos were shared a record 200,000-plus times online and became de facto ads for the Palace Museum—more than 80,000 people showed up after a lunchtime snowfall.

The Palace Museum's microblog presents a world of blossoming flowers every spring, accompanied by poetry. "There were far more species than I knew, so I had to work hard to study the flowering plants in the museum," grins Zhang, who is a sort of gatekeeper of the royal palace to modern flower fans.

The Palace Museum's popularity has grown in recent years and the digital media crew is straining to keep up with the increasing demand.

"For some, the Palace Museum is just a tourist attraction," says Zhang. "But it's actually much more than just a museum. We want to offer a visual feast to our users and provide compelling information about the Palace Museum so that they may fall in love with it as much as we have."

# Wu Man: Chinese Music on the World Stage

**Text by Li Yiqi**

A traditional Chinese four-stringed lute, the *pipa* originated in Central Asia. After evolving for thousands of years, it became a mysteriously exotic instrument, especially in the eyes of Westerners. Wu Man, a Chinese woman living in America, plays the *pipa*. She was one of the original members of Yo-Yo Ma's music team called the Silk Road Ensemble, and once performed at the White House for former U.S. President Bill Clinton and his wife. She earned seven Grammy nominations in Best Performance and Best World Music Album categories. In February of this year, the Silk Road Ensemble won Best World Music Album at the 58th Grammys for *Sing My Home*. Wu introduced the *pipa* to the world, making it a household name for many around the world.

## Opening Foreign Doors with the *Pipa*

"Why don't traditional instrument learners go abroad?"

In the 1990s, when studying abroad first became all the rage in China, many of Wu Man's schoolmates who majored in Western instruments went to Europe and America to further study. Wu began pondering why not her. The vast world outside deeply attracted her. At that time, Wu had already become the first to obtain a master's degree in *pipa* performance at the Central Conservatory of Music, and was able to stay to be a teacher there. But ultimately, she passed up the chance there to go to America with her *pipa*.

Many people asked why she chose to go abroad considering all extant knowledge of this instrument remained at home. "Who is going to teach you about this instrument? Who will you learn from there?" some asked. Wu resolutely believed that the more traditional demands even more external information. Only by understanding the opposite can one truly understand a traditional essence.

At first, Wu had little knowledge of English. She wanted to communicate through music, but Westerners were not familiar with the *pipa* or her culture, which left Wu feeling miles away from them. "Giving up wasn't an option," she stresses. "As a musician with an exotic instrument in my hand, catering to Western audiences became a huge challenge."

Wu considers her first few years in the United States "shameless." Lacking any role models, she sacrificed her personal life to dedicate every waking hour to her craft and succeeded with persistence. Whatever the occasion, whether it was paid or not, Wu seized on every chance to perform with her *pipa*. Tens of thousands of performances made Wu the musician she is today, and each one remains like a precious possession.

"I wasn't thinking about numbers back then," Wu recalls. "I just wanted to learn and introduce such a cool instrument to as many people as I could. Only much later on did Western media and spectators start talking about dissemination of Chinese music and culture. My face and my *pipa* have always been symbols of the East."

## World Music as a Family

"I prefer to be remembered as a musician more than just a *pipa* player," Wu says, "because musicians think a lot more about music and culture."

In 1992, Wu performed with the U.S.-based Kronos Quartet, which turned out to be a turning point of her musical career. The American audience's standing ovation made her realize that *pipa* playing didn't have to be confined to the traditional field of the past, but could cooperate with different instruments and conduct dialogue with music of various countries.

In 1998, famous Chinese-American cellist Yo-Yo Ma invited Wu to join his Silk Road Ensemble, which worked with many artists from countries along the ancient Silk Road to create new musical language. As a key founding member of the group, Wu was thus able to connect better with the music of the world and spread Chinese music to an even wider audience, so it was a match made in heaven.

In 2000, she contacted musicians from Iran, Mongolia, India, Tajikistan and Azerbaijan and met with them to play face-to-face. The jam session felt both strange and familiar. "So many reminded me of the music from China's Xinjiang Uygur Autonomous Region," she recalls. "It really was a wonderful experience."

The more she collaborated with foreign musicians, the more Wu believed that all instruments are connected. Every instrument is linked after so many centuries of musical evolution, but the lengthy time makes people forget. As Wu says, "Such cooperation in music is also a kind of dialogue on culture. It's communicating, sharing and reminding. We have to be reminded that we are, in fact, one family."

"I really didn't think much about responsibility—I was just fueled by passion for music," she admits. "When I look back now, I see I really did a lot."

## Stories Behind the *Pipa*

"I've played the *pipa* for more than 20 years. I want to dig deeper into the cultural and artistic aspects to learn the stories behind the instrument."

Wu began to consciously trace the history of the *pipa*. She traveled to Azerbaijan, Tajikistan, Kazakhstan and other countries as well as northwestern China to study rural Taoist ceremonies, shadow plays and the original music in local operas and folk songs. She spent a good deal of time in China every year to gather the inspiration to bring more Eastern traditions to the Western stage.

Studying the genealogy of the *pipa* only thrust Wu deeper into Chinese culture and her own heritage. Eventually she found herself delving into the cultural heritage of the Chinese people.

After chatting with Iranian musicians, Wu learned about Iran's ancient balbata, which was a predecessor of the *pipa*. This discovery gave her the idea of looking for *pipa* relatives throughout Central Asia through concerts.

In May of this year, Wu returned to China and scheduled a 12-city concert tour named "Frontier—Wu Man and the Silk Road Musicians." Apart from Wu, the group includes a dutar player from Tajikistan, an Italian tambourine player and a Uygur singer capable of performing ancient and modern music across national boarders and into spectators' hearts.

Wu remarks that although Central Asian countries are neighbors of China, they haven't found many opportunities to communicate in areas like art and music. Before this tour, Wu worked with Central Asian musicians on albums, in documentaries and together in concerts. The stage was set for her to introduce this traditional and novel method of cooperation to China and share the music with the domestic audience. "I wanted to show Chinese people that there are other ways the *pipa* can be performed, and that it can 'speak' other languages of music," she explains. "I wanted to show them the multicultural feeling of world music."

In the future, Wu hopes to continue working on the Silk Road Music Project and cooperating with musicians from all over the world. She hopes that Chinese instruments will find more space on the world stage and that people will learn more about the *pipa*. She wants the *pipa* to become an instrument for the whole world as well as a part of world music. "Just stay true to your mission," she concludes. "I have always wanted to spread Chinese music and culture through this instrument."

Wu Man and her stunning *pipa* music have amazed the world and refreshed Chinese people's perception of this instrument. courtesy of Wu Man

# DNA Dream Team

**Text by Zhang Xue**

This March, the international academic journal *Science* published the findings of Chinese scientists in several papers as its feature story. Researchers at Tianjin University, Tsinghua University and BGI-Shenzhen constructed four synthetic active eukaryotic chromosomes through exact matching of the synthetic genome with a designed sequence for the first time. Their work marked another milestone after construction of prokaryotic chromosomes and is expected to herald a new era wherein humans can "design, reconstruct and remodel life."

The Synthetic Yeast Genome Project (Sc2.0) was launched by American geneticist Jef D. Boeke. Research institutes in countries including the United States, China, Britain, France, Australia and Singapore participated and cooperated with each other in the project that aimed to redesign and construct yeast's 16 sets of chromosomes. Of the six chromosomes synthesized in the context of the project, four have been completed by the Chinese team so far.

Dr. Dai Junbiao, a special associate research fellow from the School of Life Sciences at Tsinghua University, led his team in completing the design and synthesis of the longest eukaryotic chromosome (synthetic chromosome 12 or synXII) of the four.

Dr. Dai Junbiao in his lab. During the interview, Dai spoke highly of the current scientific research environment in China. by Chen Jian

## China's Contribution to International Genetic Research

On a sweltering July day, Dr. Dai sat down with *China Pictorial* in his lab at Tsinghua University. Except for business trips, Dai works every day at his lab regardless of the weather.

The 43-year-old was born in Jiangsu Province. After receiving a bachelor's degree and a master's degree from Nanjing University and Tsinghua University respectively, he received a Ph.D. in the Department of Genetics, Development and Cell Biology from Iowa State University. He then studied at the School of Medicine of Johns Hopkins University as a postdoctoral fellow. During his stay at the university, he received the Albert Lehninger Award named after a renowned American biochemist in biogenetics.

Dai's involvement with the Sc2.0 project also began in the United States. Jef D. Boeke, his mentor at Johns Hopkins University, first launched the Sc2.0 project. "When I joined my mentor's research group in 2006, discussions on the Sc2.0 project had just begun," Dai recalls. "Five years later, I participated in synthesis work on the first yeast chromosome in his lab."

Later that year after finishing his research at Johns Hopkins University, Dai received an invitation from his alma mater Tsinghua University and returned to China to establish his own lab as part of the "the Recruitment Program of Global Experts," also known as "the Thousand Talents Plan," which aimed to attract top global talent to China.

"Yeast has 16 sets of chromosomes altogether," Dai explains. "It took American scientists nearly five years to construct two of them, and no one knows how long it will take to synthesize the other 14." Dai hoped that his return to China would help promote international cooperation on the Sc2.0 project. "Back then, China already had the scientific research ability to contribute to the Sc2.0 project. China's cost of gene synthesis is comparatively higher, but it boasts younger scientific research professionals." Although most were not optimistic about the project in its early days, Dai remained confident.

Through efforts of various parties, Jef D. Boeke visited China in 2012. He met the scientific research teams from Tianjin University, Tsinghua University and BGI-Shenzhen at a hotel near Tsinghua University in Beijing. During the meeting, the project was officially launched in China, and each team was assigned a specific mini-project. Dai chose to tackle the longest eukaryotic chromosome, synXII.

## Young Team

Dozens of pictures of Dai's team members hang in the corridors of his laboratory. The average age of Dai's team, which consists of students pursuing master's or doctoral degrees, is less than 27. Many were born in the 1990s. Below the pictures are various certificates and awards such as "School of Life Sciences Basketball Cup Champion," "Sports Festival Team Award" and "Third Place in Badminton Team Competition," showcasing these scientific researchers' athletic accomplishments. Basketball is Dai's favorite hobby.

Since the Sc2.0 project was launched, Dai and his team dove into research work. Dai spoke highly of the current scientific research environment in China and its progress over the years, commending its advantages in pooling resources to solve major problems. "In recent years, China has allocated massive funds to fundamental research fields. Much of the equipment in U.S. labs has been used for decades whereas many Chinese labs have the newest equipment available."

When Dai returned to China in 2011, such a move was not a popular choice for Chinese students studying in the United States. However, Dai now recognizes that more and more young scientists and researchers are happy to return to China. In synthetic biology alone, abundant young research talent is returning from overseas. "Professionals matter most, but team cooperation also matters," says Dai. "In the field of synthetic biology, China has abundant talent reserves. Many young students have good ideas and tons of energy. I believe that young professionals benefiting from the 'Thousand Talents Plan' have a promising future. In the next five to ten years, they will become the driving forces in their respective fields."

## Follower, Peer to Leader

Dai believes that China's genetic research achievements will deepen understanding on life, promote related studies, and most importantly, be practically applied. Previously, genetically modified yeast had already been used to produce vaccines, medicine and certain compounds. These new findings mean that when using customized chemical substances to produce yeast becomes possible, usage will expand. Promotion and application of synthetized yeast is bound to significantly increase efficiency and improve quality in the fields of industrial production and pharmaceutical manufacturing.

Dai and his team are still conducting follow-up application research. Their latest paper is expected to be published soon by a renowned international academic journal. "Some bacterial strains suitable for industrial production can be retrieved from the yeast we designed," Dai reveals. "Consider ethyl alcohol produced by maize fermentation as an example. Due to various problems, the alcohol distilled from maize only reaches 12 percent concentration. In the future, we may try to use synthesized bacterial strains to increase alcohol strength, which could create immense economic benefits."

"On the human genome sequencing project announced in 2000, China only shouldered one percent of the work," says Dr. Yang Huanming, former head of Beijing Institute of Genomics (BIG) under the Chinese Academy of Sciences, who led China's participation in the international Human Genome Project. "This time, we constructed 25 percent of the yeast chromosomes, a breakthrough for China in the field of synthetic biology and a testament to the country's international status. The achievements exhibited China's impressive progress in life sciences. In designing and synthesizing brewer's yeast, China has evolved from a follower to a peer on the international stage. The country could possibly become a leader in the near future."

The joint efforts of Chinese scientists have gifted the country international recognition in synthetic biology. In the future, Dai hopes to make more breakthroughs in fundamental scientific research and build a company to industrialize his synthetic biology advancements.

# Old Cell Phones: Trash or Treasure?

**Text by Li Zhuoxi**

"I have five old cell phones at home that I don't know what to do with," groans Mr. Zhu from Beijing. "I thought about selling them, but the price small shops offered was too low." Dealing with outdated phones has become a perplexing headache for many.

Statistics from the China Academy of Information and Communications Technology (CAICT) show that 1,446 different models of mobile phones were released in China in 2016, and the domestic shipments totaled 560 million in the same period, accounting for a third of global shipment volume. According to industry insiders, because the sale of every new cell phone means that an old one will be discarded, about four to five hundred million unused phones will pile up in China annually over the next few years. In fact, over a billion cell phones have already been discarded. Figuring out how to deal with so many old mobile phones has become an increasingly pressing dilemma.

## Where Do Old Phones Go?

With the fast development of mobile phone technology, the average lifespan of a cell phone has dropped. According to a 2014 survey, about half of China's mobile phone users changed to a new one every 18 months.

However, compared to the rocketing sales of new phones, the volume of old phones that get recycled remains much lower. Only two percent of old phones are recycled. Most end up in landfills.

Discarded cell phones have actually become a severe waste of resources. According to environmental analysts, about 150 grams of gold can be extracted from every ton of old mobile phones. If 200 million cell phones are discarded every year at a weight of about 20,000 tons, recycling of all those phones would produce three tons of gold and 60 tons of silver.

Components of old cell phones including circuit boards, batteries, speakers, cameras and microphones all contain precious metals. And cameras can be disassembled from old phones and reused in other devices. Moreover, plastic casings, screens, earphones and chargers can all be recycled.

Meanwhile, the precious metals contained in discarded cell phones can harm the environment. If those phones are burned, poisonous gas containing carcinogenic matter will likely be emitted.

## Hidden "Golden Mine"

In spite of the great quantity, high value, and high risks of inappropriate disposal, no great shift to recycling has ever happened. Many worry that their personal information will be at risk if their cell phones get recycled because the devices carry a large amount of information.

And the recycling value of a single old cell phone is not very attractive. Regardless of the price of the phone, the cost of the material is always lower than US$200, with the rest of the costs going to research, development and promotion. When cell phones are recycled by enterprises, they are usually disassembled and the most valuable metals extracted. Not much value remains with the device whether it functions or not and the recycling returns are quite low.

Manufacturers also dread the heavy labor required to take apart phones. They don't want to pay the cost of recycling and proper disposal of the hazardous components. Many cell phone makers couldn't stay profitable if disposal was part of the equation.


September 15, 2016: Customers in a physical shop of Aihuishou in Beijing are introduced the process of recycling cell phones. IC

A worker disassembles discarded electronic products in Shantou City, Guangdong Province. VCG

## "Internet Plus" Breaths New Life into Old Phones

Given this situation, many companies aiming at recycling old cell phones through the internet, big data, O2O and other methods have been launched. Aihuishou is a leading company in recycling cell phones.

On December 21, 2016, Aihuishou received series D funding of 400 million yuan (about US$60 million). It is already seeing profits. The company focuses on recycling electronic products including cell phones, laptops and digital cameras. And it uses a new, different model to inject new life into the traditional recycling business. In the age of the mobile internet, Aihuishou has become the largest C2B (Customer to Business) recycling and treatment platform in China.

Aihuishou gets businesses to bid on recycling. Its total volume of transactions has reached 50 million yuan (about US$7.4 million) and around 100,000 electronic products have been recycled. At present, its daily transaction volume averages over 300, while the price of an order averages around 700 yuan (about US$104). The company now makes ends meet.

According to Chen Xuefeng, president of Aihuishou, most customers still prefer to go to brick-and-mortar shops to sell their old products. For example, of 100 customers, only 40 choose to mail the old phones. And of 100 products mailed, the descriptions of about 60 to 70 matched the true situations, in which case money is released to the seller. In other cases, the buyer has to talk to the seller to renegotiate the price. Although mailing saves operational costs, the hidden costs of lack of communication and poor customer experience are even higher.

The platform's profits can be credited to multiple channels of treatment for the recycled phones. Some of the phones they receive are totally scrapped. These phones are handed over to recycling institutions with environmental protection licensing, which expertly disassemble them and extract the precious metals. Some phones are still partially functional. The functional components are removed and repurposed as replacement parts. Others are relatively new models with perfect functionality and only a few scratches. These are sold on its own platform or JD.com, a popular e-commerce platform in China.

According to incomplete statistics, around 20 percent of phones recycled by Aihuishou are resold, 50 percent are bid on by recycling institutions and 30 percent are disposed of in an environmentally-friendly manner.

"At first, we just wanted to create the circular economy for electronic products and make the most use of those products," explained Chen. "But the goal of the company has changed to align with the development of the market. All our efforts serve the purpose of changing users' opinions on recycling and the recycling industry. Aihuishou has always endeavored to promote environmental protection through business and change our future living space."

# Hoh Xil Heroes

**Text by Xiao Huanhuan**

On July 7, 2017, the 41st session of the UNESCO World Heritage Committee approved the addition of China's Hoh Xil to the World Natural Heritage List. Hoh Xil, literally "blue ridge" or "beautiful girl" in Mongolian, is located in the northwest of Qinghai Province and the center of the Qinghai-Tibet Plateau and covers an area of 6 million hectares. It is popularly known as one of the three major "no-man's lands" in the world. The region boasts the densest distribution of lakes on the Qinghai-Tibet Plateau and tens of thousands of square kilometers of wilderness, wild animals, mountains and glaciers. With the inscription, Hoh Xil became Asia's largest World Natural Heritage site.

"I heard the good news late because I had been busy patrolling the fields," says Sonam Geleg, "We drank some liquor to celebrate." The 39-year-old is head of the Wudaoliang Protection Station of Hoh Xil and one of more than 40 members of the Hoh Xil Patrol Team. Sonam and his colleagues remained excited for days after hearing the news. For decades, they have endured various hardships at an altitude of more than 5,000 meters while combatting poaching and illegal mining as well as saving wild animals. They feel the hard-won victory made all their painstaking effort worthwhile now that Hoh Xil is officially recognized as a World Natural Heritage site.

## Ending Poaching

Sonam directly participated in Hoh Xil's application for the status of World Natural Heritage. On October 15, 2014, Qinghai Province formally started preparations by gathering a group of specialists in fields of biological diversity, geology, water engineering, hydrology, meteorology and aesthetics. After more than a year of work, Hoh Xil finally qualified to represent China to bid for World Heritage listing in January 2016.

During this period, the International Union for Conservation of Nature and Natural Resources (IUCN) sent inspectors to Hoh Xil for field trips. Sonam Geleg personally accompanied them. "They were astonished by the biodiversity of the place," says Sonam. "Before coming here, all they knew was that the climate is dry and cold and lacks oxygen and water, making the land unsuitable for human habitation. After the investigation, they agreed that Hoh Xil conformed to standards for natural heritage with high integrity and good protection and management conditions."

Hoh Xil, literally "blue ridge" or "beautiful girl" in Mongolian, is known as one of the three major "no-man's lands" in the world. VCG

According to IUCN's evaluation report, more than a third of the higher plants found in Hoh Xil are unique to the Qinghai-Tibet Plateau, and all the herbivores that live on these plants are also found nowhere else. "The nomination has extraordinary natural beauty," the report declared. "Its beauty is beyond human imagination and amazing in all respects."

Sonam is usually a quiet man, but when speaking of Hoh Xil, he starts talking a mile a minute. "For 12 years, we haven't heard the gunshots of poachers," he says. "We risked our lives to achieve this. Today, Hoh Xil is home to 60,000 antelopes, a big increase from 20,000 in 1997, its lowest on record. More than 20,000 Tibetan wild donkeys and tens of thousands of wild yaks also live here. The effective protection of local animals greatly helped Hoh Xil's approval."

## Guardians of the Plateau

In 1997, 19-year-old Sonam retired from the military. His passion was so ignited by watching a documentary about Hoh Xil protector Sonam Dargye that he decided to go there to be a patrolman. At that time, he and his teammates worked and lived in tents, which were frequently blown away by powerful winds. On trips into the wild, they couldn't even light a fire to boil water, so they often gnawed on dry instant noodles washed down with a handful of snow. Without bedding, they huddled together to keep warm at night.

Thanks to the painstaking efforts of Hoh Xil Patrol Team, the population of Tibetan antelopes in the region has increased from 20,000 in 1997 to 60,000 today. CFB

Hoh Xil boasts the densest distribution of lakes on the Qinghai-Tibet Plateau. VCG

More than 20,000 Tibetan wild donkeys live in Hoh Xil. VCG

When their truck gets stuck in the mud, the patrolmen dig it out. In rainy season, this happens as often as 30 times a day. VCG

In addition to patrols, the team was also tasked with collecting garbage, which is not an easy job at 5,000 meters above sea level. As few as several steps can make one out of breath, and they had to bend over repeatedly, which caused headaches and loss of appetite at night. "In the late 1990s, Tibetan antelope poaching was rampant, and we encountered heavily armed poachers almost every time when we patrolled. Several times, I narrowly escaped getting shot myself."

His leathery tanned skin makes Sonam look older than his age. "I never knew cold and oxygen deficiencies could cause physical damage or I would have taken some countermeasures," Sonam smiles. The patrol team usually drives down bumpy roads through the no man's land a dozen hours a day. One patrol trip in the region often takes as long as a dozen days. If the truck gets stuck in the mud, they dig it out. In rainy season, they do this as often as 30 times a day.

Since 2010, the team's working conditions have improved. They attached a trailer to the truck to carry gasoline, tents and luggage. Now they can boil water when away from the station. While patrolling, at least they can have instant noodles hot and add packets of pickles. Driving 10 hours across bad road conditions leaves the team time for only one meal a day. For 20 years, Sonam has lived rough and now suffers from serious lumbar disc herniation and arthritis, "occupational diseases" shared by almost all of his colleagues.

"Every time we went into the wilds of Hoh Xil, we felt like we were saying our last goodbyes to our families," says Sonam. In 1999, they were trapped in the mountains for 40 days with a truck that ran out of gas. To save food, they ate just one piece of steamed bread a day. When they were found by the rescue team, they hadn't eaten for three days. "With Hoh Xil approved as a World Natural Heritage site, it was all worth it," Sonam exclaims.

## More than Glory

After risking their lives to protect Hoh Xil for 20 years, Sonam and his teammates are finally seeing the fruits of their efforts. In 1997 when he began patrolling, he rarely saw a Tibetan antelope. Finding traces of Tibetan antelopes three times a week was considered a big success. "They were very sensitive to human voices and the sound of engines," Sonam reveals. "If we got a few hundred meters from them, they would scatter."

Now, wild animals can be seen everywhere in the core area of Hoh Xil and along the Qinghai-Tibet Highway, including Tibetan antelopes, Tibetan wild donkeys and argalis. Train passengers often capture photos of Tibetan antelopes, and they're no longer afraid of humans. When someone raises a camera, they often look up at the lens. Sonam is most proud of his work in this regard.

Recent news, however, has made Sonam feel the inscription is just the beginning. High-resolution satellite monitoring by the Meteorological Administration of Qinghai Province has shown that some salt lakes have expanded 4.5 square kilometers since last year. The spread of salt lakes will kill grass and erode the soil. And if they continued expanding, the Qinghai-Tibet railway and highway, as well as the Lanzhou-Tibet cable and pipelines, would all be threatened.

"So, becoming a World Natural Heritage site is more than about glory—it means greater responsibility," says Sonam. "It's both a pressure and a motivation for us. We will devote our lives to better protecting this pure land."

# Aksu on the Silk Road

**Text and photographs by Zhu Xingxin**

The successful Belt and Road Forum for International Cooperation, held in Beijing in May 2017, has created great opportunities for the development of the Xinjiang Uygur Autonomous Region located at the core area of the Silk Road Economic Belt. From May 15 to 18, Aksu, an important hub along the ancient Silk Road, welcomed journalists from both Chinese and international media organizations who came for a news reporting campaign themed "Approaching the Core Areas of the Silk Road Economic Belt."

Located at the southern foot of Mt. Tianshan in Xinjiang, Aksu is an ancient city that was bustling as early as two millennia ago as a stop for caravans and travelers along the ancient Silk Road. It is also an important historical location as the destination of Zhang Qian, an envoy of the Han Dynasty (202 B.C.-A.D. 220) who was dispatched by Emperor Wudi to the Western Regions on missions of peace and friendship, and a rest stop for Xuanzang, an eminent monk of the Tang Dynasty (618-907), who endured untold sufferings on a pilgrimage to India seeking Buddhist scriptures.

Thanks to its geographical advantage, the city has long hours of sunlight in summers and wide-ranging temperatures that give Aksu especially-luscious fruits such as grapes, dates, and Hami melons, which are sold well globally.

Centuries ago, Aksu was a hub for the small kingdoms of Qiuci and Gumo in the Western Regions as well as the first stop for Buddhist culture from India moving towards central China. The place is where Eastern and Western cultures clashed to give birth to world-renowned Qiuci and Dolan cultures. In 2006, Dolan Muqam, a major component of the Uygur culture, was included on the first list of China's intangible cultural heritage. Many farmer painters in the Dolan tribe continue to work and receive lofty praise from visitors from all over the world despite a lack of any formal training. "We are inspired by our lives, which are each different from the other," illustrates Shania, a 35-year-old female farmer painter.

Home to the Dolan Culture, an intangible cultural heritage of China, Aksu attracts visitors from around the world with its historical relics, unique architecture, local food and timeless ceremonies.

Actors and actresses perform with a rotary swing at the Dolan Tribe Scenic Spot in Awat County, Aksu.

Before 1949, Xinjiang was plagued by underdeveloped education: Ordinary people rarely found a chance to go to school. Since the founding of New China in 1949, the local government has concentrated heavily on education thanks to the immense support from the central government. In 2016, the local government of Xinjiang invested 1 billion yuan to establish 552 bilingual kindergartens in its rural areas, which now number 4,387 after construction and refurbishment. The goals set in the 13th Five-Year Plan (2016-2020) will be reached ahead of schedule, and more than 560,000 additional children across rural Xinjiang will receive three years of bilingual education free of charge.

May 16, 2017: A Dolan Muqam performance in the Dolan Tribe Scenic Spot in Awat County, Aksu.

May 16, 2017: A Uygur family in Aksu entertains foreign guests.

Textiles have always been a traditional pillar industry in China. Over 60 percent of the country's cotton comes from Xinjiang. Aksu has cotton planting areas totaling some 270,000 hectares, which contribute a ninth of the country's total output. A key industrial park in Xinjiang, Aksu Textile Industrial City (TIC) has a planned area of 54.58 square kilometers, with an annual production capacity of 6 million spindles. Today, it serves as a leading production base for textile exports to Central Asia, South Asia, and Europe from some 70 garment producers including Huafu Top Dyed Melange Yarn Co., Ltd., Youngor Group and Jiangsu Lianfa Textitle Co., Ltd. In 2016 alone, Aksu TIC welcomed 28 projects worth nearly 15.6 billion yuan.

As the Belt and Road Initiative has taken off, a new, promising modern textile industrial city has emerged and created great opportunities for local raw material suppliers, surplus labor, young people from ethnic minorities, skill training in textiles and garment production, and poverty alleviation.

Today, Aksu is attractive to foreign investors and has great potential thanks to its booming textile e-commerce platforms and the cotton industry.

May 17, 2017: The production line of Huafu Top Dyed Melange Yarn Co., Ltd. in Asku TIC.

May 16, 2017: Children at a bilingual kindergarten in Aksu, Xinjiang.

May 17, 2017: The Great Canyon of Mt. Tianshan in Wensu County, Aksu.

July 6, 2017, Beijing: A Meituan Waimai delivery worker braves the rain. Frequent thunderstorms and sweltering summer heat in many Chinese cities inspire many to stay indoors instead of dining out. VCG

July 21, 2017, Beijing: In the morning, many Meituan Waimai delivery workers wait in front of restaurants for orders. According to a recent report released by IIMedia Research, compared with the booming online ordering for lunch and supper, breakfast delivery is comparatively rare and insufficient in categories, delivery speed and user experience. by Chen Jian

# Delivering the Market

**Text by Wang Shuya**

In most big Chinese cities, it's hard to miss delivery people whizzing around on scooters in brightly-colored uniforms. Around the lunch hour, they tear through the streets and lanes at breakneck speed to deliver tasty food as fast as possible to office buildings and homes. In recent years, people have started seeing logos of the biggest internet brands and their respective food delivery platforms such as Baidu Waimai, Meituan Waimai and Ele.me on their backs.

## Food Delivery Apps in Everyday Lives

The lunch hour is over when 31-year-old Ms. Zhang finally pulls herself out from her work. Instead of rushing out to fill her empty stomach, she grabs her cell phone and flips through a food-ordering app. With its own proprietary algorithm, the app ranks nearby restaurants based on Zhang's eating habits. With just a few clicks, she orders and pays for her lunch. In about half an hour, the delivery arrives at her office.

"Thanks to food delivery apps, I don't have to starve to work overtime," she beams. "You get far more choices than walking into a restaurant, and it's faster and cheaper too, thanks to coupons and discounts from the apps. So, why not?" The food is still hot when it arrives. Seamlessly, such apps have already become indispensable for people like Zhang and most of her colleagues.

Food delivery apps are wildly popular in China. Their wide-ranging, affordable catering options weaken the will to cook at home. Hot food can be delivered to almost any doorstep in the country in a dozen minutes, 24 hours a day, seven days a week. From coffee, noodles and roast duck to hot pot and Poached Sliced Fish in Hot Chili Oil, anything can be delivered. In addition to frequent discounts, app users also get free drinks from time to time. Food delivery guys have only become more numerous and busy, and now they are seen everywhere.

This March, Meituan-Dianping, one of Chinese on-demand local services giants, announced that its takeout delivery app had become the first to reach ten million daily orders and deliveries globally. And according to data released by the company, three out of every ten Chinese people use food delivery apps. Ordering food online has truly become the third regular dining method for Chinese people after cooking at home and dining out.

## Two Wheels Drive Fast

The concept of food delivery certainly isn't anything new to China, but it has never before been a consolidated nationwide industry. Decades ago, restaurant owners would deliver meal boxes to people working nearby during the lunch hour. For many years, sales volume, food options and delivery speed were severely limited. Food delivery only served specific groups like office workers and small businesses.

The rapid development of mobile internet in recent years has inspired the traditional catering industry to embrace the internet wave. There was a specific turning point: According to IIMedia Research, a Chinese mobile internet organization focusing on third party data mining and integrated marketing, China's online food-ordering market began surging in 2011. When China's big internet triumvirate known as BAT (Baidu, Alibaba and Tencent) joined the game and made many rounds of vigorous investments in online food delivery platforms Baidu Waimai, Ele.me and Meituan Waimai respectively, food delivery services in China finally realized industrialization and were quickly upgraded and expanded.

Compared to foreign online food-ordering platforms that don't provide specific delivery services, like the Grub Hub in the United States, China's online food delivery platforms creatively adopted the "Two-Wheels-Driving" mode that helps restaurants deliver food professionally and creates a complete online-to-offline (O2O) business circle.

This mode broke the bottleneck of traditional food delivery services in China and abroad. By refining labor divisions and controlling the processes with advanced internet technologies including automatic


July 21, 2017, Beijing: Near the lunch hour, food delivery drivers are seen everywhere in Zhongguancun. According to a recent report released by BigData-Research, in the first quarter of 2017, Ele.me continued to lead the industry with a market share of 36.5 percent, followed by Meituan Waimai with a share of 33 percent. Compared to last quarter, the distance between the two still remained within 3 to 5 percent. Baidu Waimai, however, suffered a series of setbacks and fell far behind. by Guo Shasha

positioning, online ordering, online payment and data distribution, it successfully matched small businesses with large customer groups, which greatly improved users' ordering experiences and dramatically promoted development of the industry.

Statistics show that China's emerging "Internet Plus" catering businesses, featuring O2O food delivery services, gained explosive growth from 2014 to 2015. By 2016, the market had reached a scale of over 100 billion yuan (about US$14.7 billion), which is expected to surpass 700 billion yuan (about US$103 billion) and penetrate 80 percent of the population by 2020.

It's also worth noting that the Chinese innovation in O2O food delivery services has begun to attract attention from overseas. DoorDash Food Delivery, an American on-demand restaurant delivery start-up founded in 2013, has followed the model of China's "last-kilometer" food delivery service and used it to grab increasing shares of the market in its own country.

## Staying on the Right Track

As new businesses emerge in China's "Internet Plus" era, convenient and efficient O2O food delivery service has stimulated consumption and boosted economic growth. It has not only brought new opportunities to many restaurants and created a wide range of jobs for the idle labor force, but also comprehensively promoted the transformation and upgrade of the traditional catering industry. For example, it effectively reduced pressures plaguing traditional businesses such as slowing revenue, surging costs and declining profits.

However, keeping the new business mode developing on the right track has become an increasingly concerning issue for many customers after many problems were exposed. On July 14, 2016, the China Food and Drug Administration (CFDA) issued

June 13, 2016, Xiangyang City, Hubei Province: Yang Jingbing, a Meituan Waimai delivery driver, picks up food for the customer. As a gym coach, Yang likes his part-time job as a delivery driver because of its flexible schedule. VCG

the world's first *Investigation Measures on Illegal Behavior of Online Food Safety*, which came into force on October 1, 2016. The document imposes new obligations on both third-party online platforms and food traders. Another highlight is that inspectors will pretend to be customers to check products from randomly selected online stores.

Thus, the major online food delivery platforms began to raise the access thresholds for food providers to resolutely avoid restaurants without proper licensing. They also introduced various post-sale service mechanisms to guarantee customers' rights. For example, Meituan Waimai implemented *Measures for Food Safety Management* and set up a mechanism to provide refunds and compensation to the customers as soon as they report a problem. Similarly, Ele.me is cooperating with the Ant Financial Services Group, Alibaba's financial arm, to start a fast track for compensation claims. Meituan Waimai and Baidu Waimai announced that they set up specific positions to check business qualification of food providers and the quality of the food.

The driving habits of delivery guys are another concern for many people. Because of their erratic and aggressive driving, accidents are up. Many cities including Shanghai, Qingdao and Shenzhen have launched special rectification actions on safety management for electric food delivery vehicles.

The analysts at IIMedia Research believe that online food delivery platforms still have many problems, but their services meet the rigid demands of vast swaths of customers, leaving the current outlook bright. With improvement of their delivery systems, longer service hours and expansion of delivery to fruits, vegetables, beverages and other daily necessities, demands will continue to be stimulated, so the market potential is enormous.

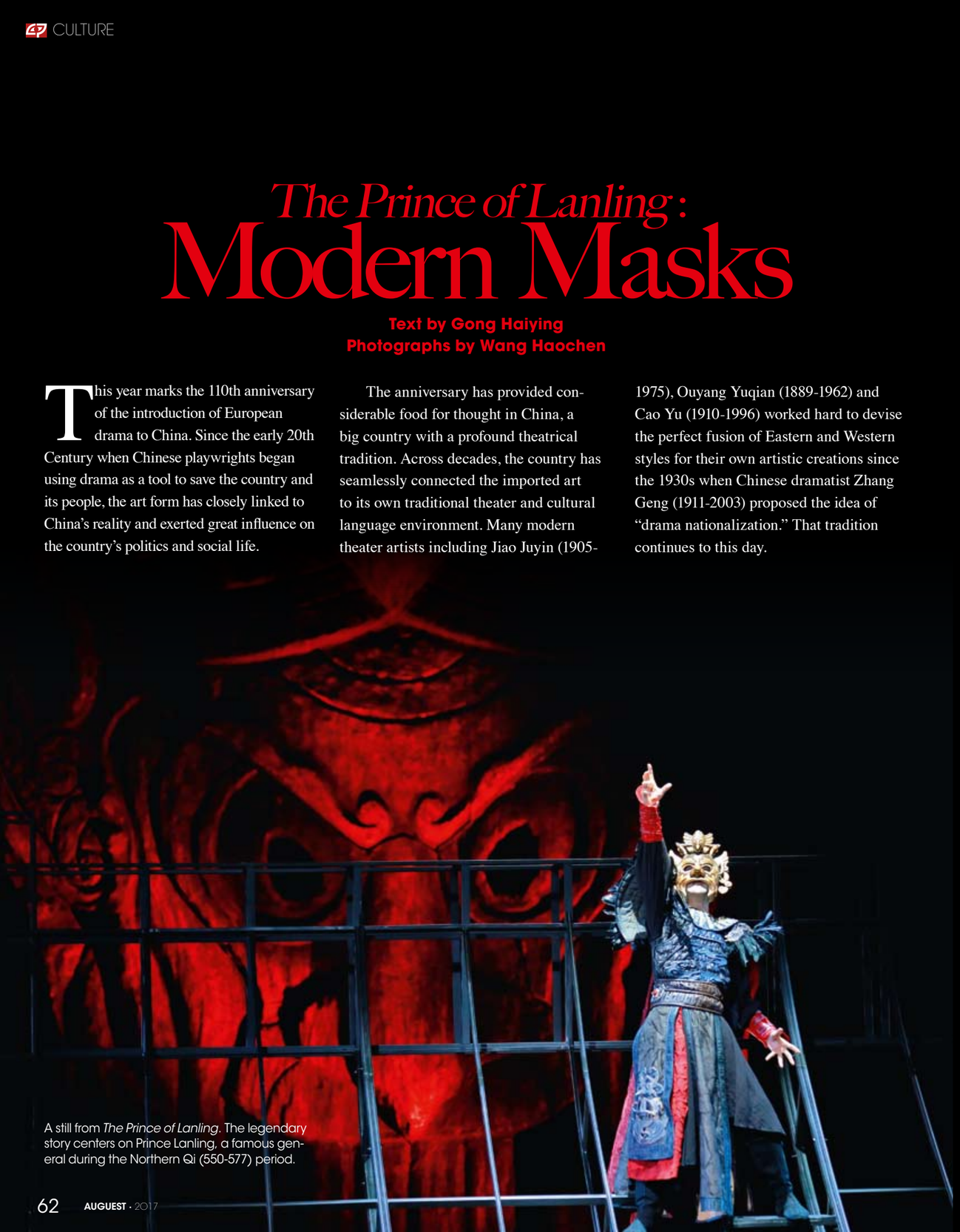
Now, most Chinese online food delivery platforms focus on first-tier cities with good mobile internet coverage. However, with the expansion of internet coverage and the improvement of consumption levels, second- and third-tier cities are the next new markets with big potential for the online catering industry.

# *The Prince of Lanling*: Modern Masks

Text by Gong Haiying
Photographs by Wang Haochen

This year marks the 110th anniversary of the introduction of European drama to China. Since the early 20th Century when Chinese playwrights began using drama as a tool to save the country and its people, the art form has closely linked to China's reality and exerted great influence on the country's politics and social life.

The anniversary has provided considerable food for thought in China, a big country with a profound theatrical tradition. Across decades, the country has seamlessly connected the imported art to its own traditional theater and cultural language environment. Many modern theater artists including Jiao Juyin (1905-1975), Ouyang Yuqian (1889-1962) and Cao Yu (1910-1996) worked hard to devise the perfect fusion of Eastern and Western styles for their own artistic creations since the 1930s when Chinese dramatist Zhang Geng (1911-2003) proposed the idea of "drama nationalization." That tradition continues to this day.



A still from *The Prince of Lanling*. The legendary story centers on Prince Lanling, a famous general during the Northern Qi (550-577) period.

Wang Xiaoying, vice president of the Chinese Dramatists Association and a famous director at the National Theatre Company of China, hopes to further explore the possibility of "drama nationalization" based on the achievements of older-generation artists.

"It's not practical to continue defining drama as an 'import' after it has been growing in China for 110 years," asserts Wang. "China still has a long way to nationalize its drama compared to Japan and South Korea, which have perfectly integrated their own cultures into the art."

Inspired by Japan and South Korea, Wang formulated the concept of "modern expression of Chinese images."

"Over the last decade, I have been searching for a modern stage image of the structure of Chinese culture, which I call the 'modern expression of Chinese images,'" he explains. His theory is evidenced in his plays ranging from *Man and Wilderness* (2006), an original drama about the "educated youth" generation, and *The Story of Overlord* (2007), a modern drama with historical themes, to *The Tragedy of King Richard the Third* (2012), a Chinese version of the Shakespeare play, and *Fu Sheng* (2014), another period piece.

On July 11, 2017, *The Prince of Lanling*, an original play directed by Wang Xiaoying, premiered at the National Theatre of China. It presents the new exploration of his directorial art guided by the theory of "modern expression of Chinese images" as well as his insight about the "nationalization of drama" in China over the last dozen or so years.

"I want to recreate the aesthetic rhythm of traditional Chinese theatrical flavor with details of storytelling, characterization, emotional expression and delivery of ideas," he explains.

A still from *The Prince of Lanling* which features elements of Nuo dance, an ancient Chinese folk dance performed during sacrificial ceremonies and exorcisms.

The legendary story centers on Prince Lanling, a famous general of the Northern Qi (550-577) period of the Northern and Southern Dynasties (420-581). The real historical figure is depicted as a delicate prince who disguises himself as an effeminate man after witnessing the assassination of his father. With focus on extremes of human nature, such as tenderness versus toughness represented by a sheep and wolf in a dualistic tone of artistic symbolism, it creates a modern version of the "soul and mask" fable.

"The nationalization of drama in China is not about simply copying external form," comments Song Baozhen, deputy director and researcher from the Chinese National Academy of Arts. "Rather, it digs deeper into cultural values and significance, which can be widely appreciated and accepted by Chinese audiences in terms of narration, forms of expression and the charm and strength of characters. *The Prince of Lanling* fits the bill."

A still from *The Prince of Lanling*. The historical figure is depicted as a delicate prince who disguises himself as an effeminate man after witnessing the assassination of his father.

# Chinese Drama Should No Longer Be an "Import"

## Exclusive interview with Wang Xiaoying, vice president of the Chinese Dramatists Association and director at the National Theatre Company of China

A rehearsal. Director Wang Xiaoying cast some traditional opera dancers in *The Prince of Lanling*.

***China Pictorial (CP):* The Prince of Lanling *is being staged as China celebrates the 110th anniversary of the arrival of European drama. Was this intentional?***

***Wang Xiaoying (W):*** Over more than a century of development, Chinese drama has always been flavored with nationalization. In the past, we considered drama an "import" which we could neither connect Chinese culture and language seamlessly, nor adapt for local audiences. We cannot define the art this way. Japan and South Korea have the best models for combining traditional culture with the theatrical art, and both countries are quite influential on the world stage.

My insight is evidenced in *The Prince of Lanling*. Over the last 10 years, I've been striving to tap the spirit of the Chinese nation through Chinese stories in a modern way, which I call "modern expression of Chinese images." Over the last few years, I've made bold attempts to support this concept in my works such as *The Story of Overlord*, *The Tragedy of King Richard the Third*, *Fu Sheng*, and *The Prince of Lanling*.

Director Wang Xiaoying takes a bow with his performers after the premiere of *The Prince of Lanling* at the National Theatre of China. The drama explores new avenues of theater through the theory of "modern expression of Chinese images."

***CP: Specifically, how does "modern expression of Chinese images" happen in* The Prince of Lanling*?***

***W:*** Not only should the "modern expression of Chinese images" infiltrate traditional Chinese art and aesthetics, it should also be presented in a modern, internationalized cultural language environment. Only by doing so can we make "the traditional more modern and the Chinese more international."

*The Song of Prince Lanling into the Array*, an ancient Chinese song-and-dance play about Prince Lanling, has always been considered a prime source for traditional Chinese opera culture, which has bestowed us the opportunity to trace our ancient culture. Guichi, Anhui Province, where I started my career, is the cradle of Nuo dance, an ancient Chinese folk dance performed during sacrificial ceremonies and exorcisms. I wanted to add such elements to the stage and cast some dancers with traditional opera skills.

According to *Yue Miscellany*, an ancient book on the music history of the Tang Dynasty (618-907), "Masks arrived during the Northern Qi period," which is also the origin of *The Song of Prince Lanling into the Array*. We know that the oldest masks ever used in the performance of the play were found in Japan, so we made a trip there and used that style for the masks in the show.

***CP: Both the East and the West are intensifying communication. Does this influence the kind of drama that is ideal for China today?***

***W:*** In the past, there were two methods in which Chinese drama could be exported. One was performances staged in foreign communities heavily inhabited by overseas Chinese to trigger nostalgia. The other was an invitation from one of the many fringe festivals, neither of which could preserve the mainstream spirit of Chinese drama.

The creation of original classics is crucial for theatrical arts. For decades, China has connected well with other parts of the globe via world classics. I hope we can express these classics in our own way, featuring the spirit and connotations of the Chinese nation. I made such an attempt in 2012 when I staged *The Tragedy of King Richard the Third*. It wasn't about the form—it was about the vigorous spirit. We need similarly excellent, mainstream dramas to present the spirit of Chinese theater and publicize the spirit and values of our nation. We want to proudly display our vitality to the world, and that's all that matters.

# Yesterday and Today: Garden on the Sea

**Text by Zhang Xue**

A bird's-eye view of 1.87-square-kilometer Gulangyu Island where permanent residents total about 16,000. The buildings scattered among lush green trees, which were constructed in the early years of last century, sharply contrast the skyscrapers of Xiamen City across the Lujiang River. VCG

Gulangyu, also known as Kulangsu, is a tiny island of less than two square kilometers that faces the mouth of the 600-meter-wide Lujiang River running through the port city of Xiamen on China's southeastern coast. On July 8, 2017, the Gulangyu historic international settlement was added to the World Heritage List as a cultural heritage site during the 41st session of the World Heritage Committee, making it China's 52nd listed property.

As the World Heritage Committee commented, Gulangyu Island witnessed the ups and downs of China's march into modernization and was surrounded by the early tides of globalization in the late Qing Dynasty (1644-1911). The island, a classic model of cultural exchange and mutual learning, was home to locals of Fujian Province, foreign expatriates and foreign-born Chinese communities. Over the years, it evolved into an international settlement known for cultural diversity and modern living.

Year round, tourists swarm to the island for its one-of-a-kind "petty bourgeoisie" flair. After marching the commercial streets, a stroll down an adjacent alley will reveal a different, peaceful side of Gulangyu. Away from the bustling crowds, you will see towering banyan trees, bougainvillea stretching from old yards, and trumpet vines on walls. Piano music reverberates through the air.

As far back as the 13th Century during the Song Dynasty (960-1279), fishermen from nearby areas began inhabiting the island. After the First Opium War in 1840, Western missionaries arrived at the island, and as Xiamen became a popular trading port, more and more churches were built. A modern international community gradually took shape as Chinese and Western residents lived together there and conducted profound cultural exchange on a daily basis.

Sunlight Rock, the highest peak of Gulangyu, is a must-see during any trip to the island. VCG

More than 900 historic buildings of various architectural styles including traditional southern Fujian style, Western Renaissance style and Veranda colonial style still stand on the island. The buildings are testament to the evolution of local architecture coupled with a steady infusion of foreign cultures.

Residents of southern Fujian call their houses "cuo." The Dafu Mansion and Four-row Dacuo (traditional Chinese palatial residence with upturned eaves), built in the early 19th Century, are the oldest residential houses of southern Fujian style still standing. The Dafu Mansion was built by Huang Xuzhai, a Xiamen local, in the late Qing Dynasty. His son, Huang Kunshi, who was a senior official, built the Four-row Dacuo to the right of the Dafu Mansion to house his seven children.

"Sea Paradise," a group of five villas located at 38 Fujian Road, is a renowned combination of Chinese and Western architecture. The historic site, originally the only foreigners' club in the concession area, is a palatial architectural complex that was fitted with an especially elaborate roof after Huang Xiulang, a Chinese expatriate based in the Philippines, purchased it in 1912.

Of the five old villas in Sea Paradise, three are open to public, one of which has been transformed into a café of Southeast Asian style and another is a performance center for local cultural shows.

Shuzhuang Garden, situated right on the seashore, is a crucial piece of any trip to Gulangyu Island. Against the backdrop of the vast sea, its traditional Chinese garden layout is unparalleled.

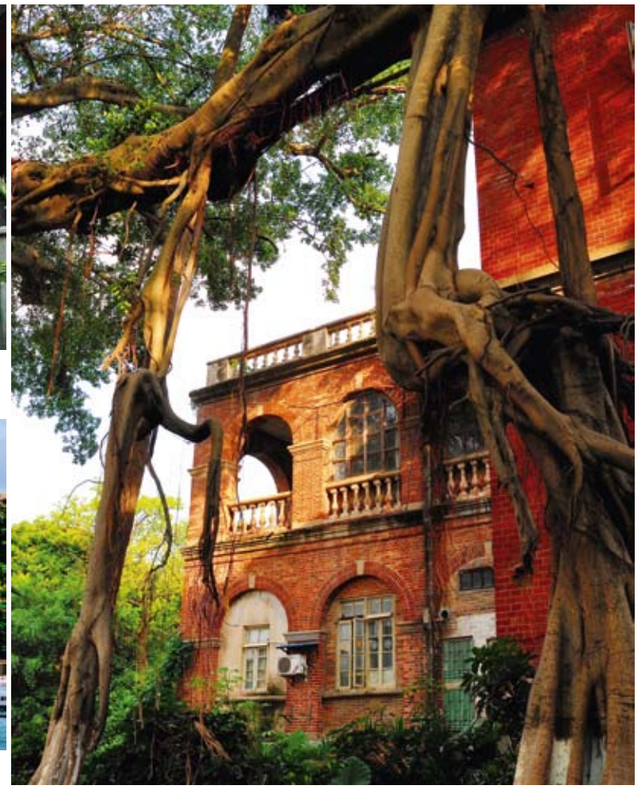
The cultural heritage of Gulangyu comprises 51 historic buildings, of which some have been abandoned, some renovated into villa hotels and others refitted as museums, cafés and book stores. Wandering tourists can get closer to the soul of Gulangyu through the legendary tales of the building owners.

Many tourists stay in family hotels renovated from old villas to experience island life in the old days. IC

Small shops on the Longtou Road attract crowds of young tourists. IC

Sea Paradise, a group of well-known villas on the island. IC

The red-roofed Eight Diagrams Tower, first built in 1907, is a landmark of the island. It was designed by Johannes Abraham Otte, the Dutch-American president of Hope Hospital, and is now an organ museum. Xinhua



A red-brick building partly shaded by old banyan trees presents the oldest traces of the southern Fujian culture. VCG

The modern buildings across the Lujiang River in downtown Xiamen are visible through the porch of an old building on Gulangyu Island. VCG

Gulangyu is also called "piano island." In the middle of the 19th Century, Western music gripped the island alongside the arrival of Christianity. The island was known for its music by the 1920s and 30s and began generating world-class musical talent. The long list of standouts from the island includes Zhou Shu'an, China's first female conductor of vocal music, Lin Junqing, former president of an institute of vocal music studies in Shanghai, pianist Yin Chengzong and violinist Xu Feini. The "piano island" nickname is warranted: The islanders' per capita piano ownership is the highest in the nation.

## Big Names

Culturally diverse and inclusive Gulangyu Island is also known for the legends of contemporary celebrities.

Early in the 20th Century, ten-year-old Lin Yutang boarded a boat in a small town in Zhangzhou, Fujian Province, to head for the island. After three days on the waves, Lin enrolled at a church school there. He graduated from Yangyuan Elementary School and Xunyuan Middle School. At 24, Lin married Liao Cuifeng, a young woman from Xiamen, with a traditional Chinese ceremony in one of the island's Western churches, and then headed to study at Harvard University. Lin eventually became a cultural master of both Chinese and Western spheres.

Lin Qiaozhi, a Chinese pioneer in obstetrics and gynecology, was born in a teacher's home on December 23, 1901. On the island, she enrolled in a children's school and then Xiamen Women's Normal School. Her education continued at Beijing Union Medical College in 1921, and then she earned a doctoral degree at the State University of New York. Though unmarried throughout her life, Lin delivered more than 50,000 other people's babies.

Ma Yuehan, China's earliest sports educator, spent his early days in Gulangyu at Fumin Elementary School. Ma then attended Saint John's University in Shanghai, where he was a standout on the university's sports team. After graduation, he began teaching at Tsinghua College, the predecessor of Tsinghua University. In 1936, he attended the 11th Olympic Games in Berlin as the chief coach of the Chinese delegation.

Books

*By Fu Xiaotian*
*China Intercontinental Press, June 2017*

"Talk with the World Leaders" is a serious talk show on the Phoenix Satellite Television featuring interviews of political heavyweights from around the world. In late June, hostess Fu Xiaotian published *Talk with World Leaders on China*, based on her experience with the show. She selected 20 interviews with various world leaders from early 2014 to early 2017 to trace China's development through stories from the perspectives of the interviewees.

An alumna of the University of Cambridge, Fu formerly served as London bureau chief for Phoenix. She excelled at inspiring interviewees to answer complicated questions with simple language and viewers to think differently by asking tough questions with ease and grace, brief and to the point.

For the book, she selected interviews with distinctive figures who have developed long-term relationships with China, including former UN Secretary-General Ban Ki-moon, former Italian Prime Minister Matteo Renzi, Syrian President Bashar al-Assad, Iranian Foreign Minister Muhammad Javad Zarif, former British Prime Minister Gordon Brown, and former U.S. Secretary of State John Kerry, among others. The author edited transcripts to remove outdated material and place more focus on the ideas and concepts that remain greatly relevant today.

The author presents readers with information on politics, political wisdom and diplomatic maneuvering. For example, a large part is devoted to a talk with Iranian Foreign Minister Muhammad Javad Zarif on the Iranian nuclear agreement signed between Iran and six countries including the United States, Britain, France, Russia, China, and Germany. The book also collects relevant talks on the investigation of Malaysian Airlines Flight 370 that were never broadcast from her interview with Malaysian Prime Minister Najib Razak. Another core topic is the relationship between the United States and Russia and China, which was discussed by John Kerry.

The author endeavors to navigate multiple layers of information including the art of leadership against different cultural backgrounds, contrasting global outlooks and the values promoted by each religion and civilization as well as cross-cultural communication. For instance, during her interview with Iranian Foreign Minister Muhammad Javad Zarif in 2015, Fu mentioned her interview with John Kerry after she noticed that the minister's foot was wrapped in gauze. "Kerry broke his leg riding a bicycle soon after our meeting," she noted. "This time I see something has already happened to your foot."

Zarif comfortably and naturally talked about Kerry's injury before pivoting to their negotiations on the Iranian nuclear issue in Switzerland. The silky smooth transition was expertly engineered by Fu. Zarif went on to comment further on the U.S. interests in the Middle East after the ice was broken.

When asked about "perfectly symmetrical bicameralism" in the eyes of Italians during an exclusive interview in 2016, then Italian Prime Minister Matteo Renzi replied with Chinese flavor: "It's not perfect, as I've jokingly explained using a popular Chinese sport. Bicameralism sometimes can be like a Ping-Pong match, with the ball moving from one side to another side, one side to another side."

Of course, all of the interviews evidence China's progress and dramatic changes from the perspectives of world leaders and cover a wide array of subjects closely related to China such as the Belt and Road Initiative, the relationship between China and the EU, Russia and Britain, and cooperation between China and the United Nations.

As described in the preface, "China is playing an unprecedented role in the world arena thanks to its economic development, growing national strength, and implementation of new foreign policies featuring Chinese characteristics. The world is listening to China, a listener to the world. Happenings around the world have bestowed our program and the book the most fertile soil."

June 2017: Fu Xiaotian (2nd right) is made a Knight of the Star, one of Italy's highest honors, at the Italian Embassy in China. She had interviewed an Italian foreign minister, two prime ministers and a president.

# Future Rhapsody: Zipped and Unzipped

**Text by Yi Mei**
**Photographs courtesy of Beijing Today Art Museum**

A leader in the exhibition of contemporary Chinese art, Beijing Today Art Museum is holding another spectacular exhibition: ".Zip Future Rhapsody." Curators employed the literal meaning of ".zip" (compression and decompression) to sketch an understanding of the future. In their imagination of tomorrow, various art forms represent different dimensional items radiating from the Big Bang. Without time and space limits, the future cannot and should not be defined.

The exhibition includes a variety of media including installations, experimental music, sound and spatial interaction as well as images and light shows. It aims to prod the personal feelings of spectators. In the exhibition hall, visitors must follow a hidden guide to find all of the exhibits. The works on display are not confined to pieces on a wall and can include the different feelings of various people. For example, in Wu Juchui's *E-Blood Bag*, visitors can charge their cell phones with what looks like a blood transfusion, highlighting modern obsession with electronic devices and the life-and-death importance of a functioning device. In Turkish artist Refik Anadol's *Infinite House*, the infinite extension of time and space invites viewers to ponder the piece's inherent reality. The main hall offers an immersive experience in which spectators hold a lightning rod of new media art. A new interactive surprise lurks around every corner as the audience is mesmerized by the works on display.

*Cornerstone* by Gan Jian (China), projection mapping, variable dimensions, 2017.


*E-Blood Bag* by Wu Juehui (China), charging equipment, variable dimensions, 2016.

The Future Gallery of Beijing Today Art Museum compresses many powerful works into a single time and place. The immersive perception provided by the collective works seems to take visitors on a trip through the black hole, guiding them to use every sense and imaginative molecule to form their own understanding of the works.

"The name '.zip' is not as serious as it looks," remarks curator Wu Juehui. "It was inspired by words I saw in a group chat on WeChat in 2014: 'The suffix of art in critics' eyes is .txt; in rich people's eyes is .jpg, but I think the suffix of art is still .exe.' I agree a lot with that assessment and still think about it a lot. It reflects some of the problems in today's art circles. The expansion of the universe is like a continuous decompressing process. New formats emerge and old ones fade. While we are using a format, we are also self-formatting. In a large format system, each person comes with his or her own format. They may be .text, .jpg, .ppt, .exe or just a bug."

*Another World in My Dream* by Claude Lévêque (France), red neon light, hazer, variable dimensions, 2017.

*Infinity Room* by Refik Anadol (Turkey), installation, variable dimensions, 2015.

During the exhibition, Gao Peng, director of Beijing Today Art Museum, granted an exclusive interview to *China Pictorial*.

***Why did you launch the project of the Future Gallery? What is the Future Gallery on earth? What do you want to convey through the project?***

**Gao Peng:** Since I took office as director of Beijing Today Art Museum in 2013, several questions have been lingering in my mind: What is the future of museum? What will we display tomorrow? What will the relationship between patrons and the museum be like in the future?

Based on these reflections, we launched the "Future Gallery" program. Our Future Gallery is not a physical entity, but an experimental project to predict the landscape for future development. It is a museum model for the next few decades based on the imagination of a group of today's art practitioners. The collaboration of our museum and artists, as well as their interaction with the audience, presents an exhibition featuring an immersive experience, audio and visual feast, artistic cross-media interaction and information processing, virtual and realistic overlap, human-machine interaction and various new media art works. It bravely foresees a flowing and changeable future by the way of art.

***It seems that many spectators are more attracted to the fantastic and stunning appearances than the works' connotations. How do you inspire people to look deeper at these works?***

**Gao Peng:** At any age, the core themes of art never changed too much: love, hatred, life, death, desire and our attitude towards the surrounding environment and social relations. But as times change, the media of artistic expression constantly evolve. When various artistic media are relatively new, spectators will naturally be drawn to the form rather than core contents.

So it is an important duty for museums to help audience tell what is just a show and what is the expression of artists' inner feelings. I believe that after seeing many exhibitions, the spectators' taste gradually improves, thus fostering independent artistic judgment. We prepare a QR code for each work at this exhibition—if they want, spectators can scan the QR code to listen to a demonstration about each work. Many volunteers and staff of the museum are always on hand to explain various components of the works to visitors and help them better understand and respect art.

***What is the difference between the Future Gallery project and other new media exhibitions?***

**Gao Peng:** We insist that the Future Gallery is not a multi-media exhibition but an experimental art project about the future, because we don't want to mislead our audience into thinking it's just a multi-media show. Our project involved many artists, scientists and engineers working together to complete the works. This exhibition has invited plentiful well-known artists from home and abroad. We hope the heavy-hitting artist roster can make our Future Gallery a new field of art research and inspire the audience to contemplate creativity.

"Creativity" is unknown and "future" is also unknown. If we do not admit these 'unknowns', where can creative power come from? Many works in this exhibition are bold and pioneering, even beyond the understanding of art for some. We not only spent a lot of labor and financial resources, but also changed the overall structure of the museum, in order to break traditional ideas about museums. As long as curators and artists have good ideas, our museum will support them unconditionally. We hope that this project can guide the public out of traditionally comfortable aesthetic experience and to face the bold and experimental art of future.

***What is the status of the Future Gallery in an international context?***

**Gao Peng:** In 2015, we invited Suzanne Anke, former president of the New York School of Visual Arts, to participate in our first Future Gallery program. When she came to support us, she was nearly eighty years old. Why was she so devoted? Because when she saw our program, she was very excited. She said that even in New York, many art museums did not dare to do something like this. Many museums are only willing to show a few artists who are very successful commercially, and these museums stay prudent in their embrace of more creative concepts. Susanne Anke valued the plasticity and creativity of our Future Gallery and did a lot of promotion for us.

We also received a lot of positive feedback this year. "The future is unknown and never has a clear start," says Philipp Ziegler, head of the curatorial department of ZKM Center for Art and Media Karlsruhe in Germany. "When you take the world stage to speak out your independent opinion about a common confusion, you're already at the forefront of the times. I feel very honored to take part in this global cutting-edge discussion with other art practitioners of the young generation."

*.Bug* by UFO Media Lab & PINK MONEY (two Chinese art groups), projection mapping, variable dimensions, 2017.

On Display


A poster for "Leng Guangmin: Perfect Destruction".

## Leng Guangmin: Perfect Destruction

On display are works created in the last two years by Leng Guangmin, a representative of the young generation of contemporary Chinese artists. The subjects that Leng depicts in his works usually have no complicated structures, but feature rich connotations that give his works a "uniquely relaxing flavor yet the tension to inspire thought."

Born in 1986, Leng graduated from Tianjin Academy of Fine Arts in 2012. He is an expert in abstract painting, and many of his works have been acquired by state-level art galleries.

*July 15–August 20, 2017*
*Hive Center for Contemporary Art, Beijing*

*Ear*, propylene on cloth, 70x80cm, 2016.

*Gauze*, propylene on cloth, 150x200cm, 2017.

## Follow Me: New Narratives in Contemporary Photography, China-Switzerland

The exhibition showcases works by 10 young photographers from China and Switzerland, depicting interlaced time and space in various ways, such as static and dynamic images and projections.

The show consists of four parts. The first part shares probes of identity, asking "Who am I?" through personal stories. The second part showcases the unforgettable moments and pursuits along the journey of life. The third part depicts the boundary between the imaginary and the documentary through the roles they've played. The fourth part is flavored with history and archaeology through memories, individual and collective, with the help of their photography.

*June 19–September 17, 2017*
*OCT Contemporary Art Terminal, Shanghai*


A poster for the exhibition.

## On Site Impromptus: Dance and Moving Images in Daily Space

This exhibition features 31 artists and artistic groups from 18 countries and focuses on dance images in daily and public spaces, an art form that emerged in the early 20th Century, as differentiation between theater, dance and other artistic forms in the modern language environment has melted away.

The exhibition also includes other events such as a series of seminars and workshops on dance images and a performance jointly presented by young dancers.

*June 3–August 20, 2017*
*Ming Contemporary Art Museum, Shanghai*


A poster for the exhibition.


A poster for the exhibition.

## Guan Yu: To Be Hungry for Wind

This is a solo exhibition of paintings by contemporary young Chinese artist Guan Yu, who was born in 1989. With a unique angle on daily life, Guan boldly adds large areas of blocks with light brushwork and bright colors, improving the "purity" of the painting and easing the canvas' burden of carrying pictorial information.

Born in Qingdao, Shandong Province, Guan graduated from China Academy of Art in 2011 and obtained an MFA degree from the Slade School of Fine Art of the University College London in 2013. She lives and works in Qingdao, London and other parts of the world.

*July 15–August 20, 2017*
*Hive Center for Contemporary Art, Beijing*

## Into the Scenery—Out of the Settled

This exhibition features cartoon installations and ink-and-wash work by female Chinese artists Shen Ruijun and Zhuo Ying, who usher the audience into a brand-new, exotic art world.

Zhuo Ying graduated from the Department of Oil Painting of Guangzhou Academy of Fine Arts in 2002, and received a master's degree in animation from the Academy of Art University in San Francisco in 2006. She teaches at Guangzhou Academy of Fine Arts. Shen Ruijun graduated from the School of the Art Institute of Chicago with a master's degree. Both have exhibited their works many times at home and abroad, and participated in major art events in China and around the world.

*June 18–August 31, 2017*
*33 Contemporary Art Center, Guangzhou*


A poster for "Into the Scenery—Out of the Settled".

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