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LEAD ARTICLE

China's Chang'e-4 Probe soft-lands on moon's far side

Photo provided by the China National Space Administration on Jan 3, 2019 shows the first image of the moon's far side taken by China's Chang'e-4 probe. China's Chang'e-4 probe touched down on the far side of the moon on Jan 3, 2019, becoming the first spacecraft to land on the moon's uncharted side, which is never visible from Earth. The probe, comprising a lander and a rover, landed at the preselected landing area at 177.6 degrees east longitude and 45.5 degrees south latitude on the far side of the moon at 10:26 am Beijing Time (0226 GMT), the China National Space Administration announced. (IMAGE FROM XINHUA)

No wind blows and no rain falls there. Only crashing meteorites occasionally disrupt the stillness. The desolate landscape on the far side of the moon - never visible from Earth - has waited billions of years for the first-ever soft landing of a visitor from Earth.

After orbiting the moon for more than 20 days, the Chang'e-4 probe, launched from the Xichang Satellite Launch Center in southwest China on Dec 8, 2018, has seen countless craters, mountains and valleys on the moon.

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HOT ISSUE

CAS announces winners of Award for International Scientific Cooperation 2018

Three foreign scientists have received the 2018 International Scientific Cooperation Award of the Chinese Academy of Sciences on Jan 17, 2019 for their contribution to China's scientific development.

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RESEARCH PROGRESS

Breakthrough in tactile sensors for E-skin

A research team led by Prof. Li Runwei at the Ningbo Institute of Materials Technology and Engineering, in cooperation with the National Institute for Materials Science in Japan, has developed a flexible tactile sensor that could be used in electronic skins and is able to detect subtle changes such as moving ants.

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INTERNATIONAL COOPERATION

Five foreign scientists honored

Five foreign scientists won the 2018 China International Scientific and Technological Cooperation Award in Beijing on Jan 8. >> **PAGE 8**

SCIENCE STORY

A Journey to FAST: the Eye of Heaven

I am Bhusan Kayastha from Nepal, a PhD student at National Astronomical Observatories of the Chinese Academy of Sciences (NAOC). >> **PAGE 9**

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Finally, its destination on the far side, the South Pole-Aitken (SPA) Basin, the largest, deepest and oldest crater in the solar system, was illuminated by the rising sun.

The developers of Chang'e-4 decided on Jan 3, 2019 it was time to come down onto this barren world.

At 10:15 am, a variable thrust engine was ignited with the assistance of the relay satellite Queqiao (Magpie Bridge), in a halo orbit around the second Lagrangian (L2) point of the Earth-moon system, about 65,000 km from the moon, where it can see both Earth and the moon's far side.

Chang'e-4's relative velocity to the moon was lowered from 1.7 km per second to close to zero, and the probe was adjusted to face the moon and descend vertically towards the Von Karman Crater in the SPA Basin.

As it descended to an altitude of about 2 km, its cameras captured the shadows of the hills and valleys on the lunar surface. Its computer identified and assessed large obstacles such as rocks and craters, so the probe could avoid them.

At 100 meters up, the probe hovered to identify smaller obstacles and measured the slopes on the surface. Its computer calculated again and selected the safest site.

At 2 meters above the surface, the engine stopped, and then the golden lander with a silver rover on top touched down on the desolate gray surface with four legs, throwing up some dust.

The probe performed the entire landing process, which lasted about 12 minutes, with no intervention from ground control; the relay satellite then transmitted the first close-up photos of the moon's far side back to a control center in Beijing.

The China National Space Administration later announced that the probe landed at the preselected landing area at 177.6 degrees east longitude and 45.5 degrees south latitude on the far side of the moon.

"It's an important milestone for China's space exploration," said Wu Weiren, chief designer of China's lunar exploration program.

"It is a perfect display of human intelligence," said Jia Yang, deputy chief designer of the Chang'e-4 probe, from the China Academy of Space Technology (CAST).

Named after the Chinese moon goddess "Chang'e," China's lunar exploration program, which began in 2004, includes orbiting and landing on the moon, and bringing samples back to Earth.

After Chang'e-3 completed China's first soft landing on the moon in 2013, Chinese space experts aimed high, hoping Chang'e-4 could carry out unprecedented and more challenging tasks.

"Landing on the far side of the moon is more risky than landing on the near side. The rugged terrain on the far side has raised many problems," said Sun Zezhou, chief designer of the Chang'e-4 probe, from CAST.

"But solving those problems might help lay the foundation for future space exploration. High-precision landing is a necessity for further exploring the moon and asteroids. We hope to be able to reach the whole moon and even the whole solar system," Sun said.

"The far side of the moon has unique features never before explored on site," said Zou Yongliao, director of the lunar and deep space exploration division of the Chinese Academy of Sciences. "The exploration of this virgin land by Chang'e-4 might bring breakthroughs."

The moon is tidally locked to earth, rotating at the same rate that it orbits Earth, so the same side of it is always seen from Earth, leaving the far side a mystery, until now.

About 60 years ago, the Soviet Union's Luna 3 probe sent back the first images of the moon's far side. And about 50 years ago, three astronauts on the United States Apollo 8 mission became the first people to see it with their own eyes.

Lunar orbiters have shown that the moon's two sides are very different: the near side is relatively flat, while the far side is thickly dotted with impact craters of different sizes.

Scientists believe that the lunar crust on the far side is much thicker than the near side. However, the reason is still a mystery. Only on site exploration might reveal the secrets.

The moon and Earth shared a similar "childhood." But traces of the remote past on Earth have been erased by geological activities. "The moon might provide some insights into the early history of Earth," said Lin Yangting, a researcher at the Institute of Geology and Geophysics.

Exploring the Von Karman Crater in the SPA Basin is meaningful in another sense. The crater was named after a Hungarian-American mathematician, aerospace engineer and physicist in the 20th century, who was also the teacher of Qian Xuesen and Guo Yonghuai, the founders of China's space industry.

Nearly 50 years have passed since people first stood on the moon. Can we return? How will radiation on the moon affect astronauts? How much water is there?

Scientists from China, Germany and Sweden hope to find the answers through Chang'e-4, and make preparations for people to return to the moon.

Professor Robert Wimmer-Schweingruber, of the Institute of Experimental and Applied Physics of Kiel University in Germany, said that preparing for future human exploration of the moon was an excellent idea.

"If astronauts come back to Earth, the radiation on the moon is the only danger that remains in their body. So we need to understand that," he said.

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CAS announces winners of Award for International Scientific Cooperation 2018

Three foreign scientists have received the 2018 International Scientific Cooperation Award of the Chinese Academy of Sciences on Jan 17, 2019 for their contribution to China's scientific development.

The winners are Singaporean fracture mechanics expert Shih Choon Fong, Norwegian ecologist Nils Stenseth and Japanese climatologist Toshio Koike. Their certificates and medals were presented by Bai Chunli, President of the academy, in a ceremony in Beijing.

The winners are long-term participants and contributors to the academy's scientific endeavors, academy Vice-President Zhang Yaping said during the ceremony.

"Various institutes from the academy should take advantage of opportunities presented by the Belt and Road Initiative and continue to collaborate with world-class foreign scientists," he said. "This will allow us to create an innovative environment that is beneficial for producing research, talent and ideas, and accelerate the academy's process of becoming a world-class research institute."

The award was first presented in 2007 and has been given to 34 foreign experts, 24 of whom went on to win the China International Science and Technology Award, the nation's top honor for foreign scientists.

"It is a great honor to receive the academy's award because it is proof of the collaboration between our scientists," said Koike, who has been studying the water cycle on the Qinghai-Tibet Plateau with Chinese peers since 1991.

The plateau, origin of many of the major rivers in Asia, has drawn global scientific interest, especially from scientists studying climate change, he said. "Small changes in the Tibetan plateau's geophysical conditions will have a big impact in Asia and the rest of the world."

From left: Shih Choon Fong, Bai Chunli, Nils Stenseth and Toshio Koike.

Koike said changes already are taking place as the plateau becomes warmer, resulting in melting glaciers and more rainfall that can lead to avalanches and flooding.

Frozen soil might also loosen, making roads less safe, Koike added.

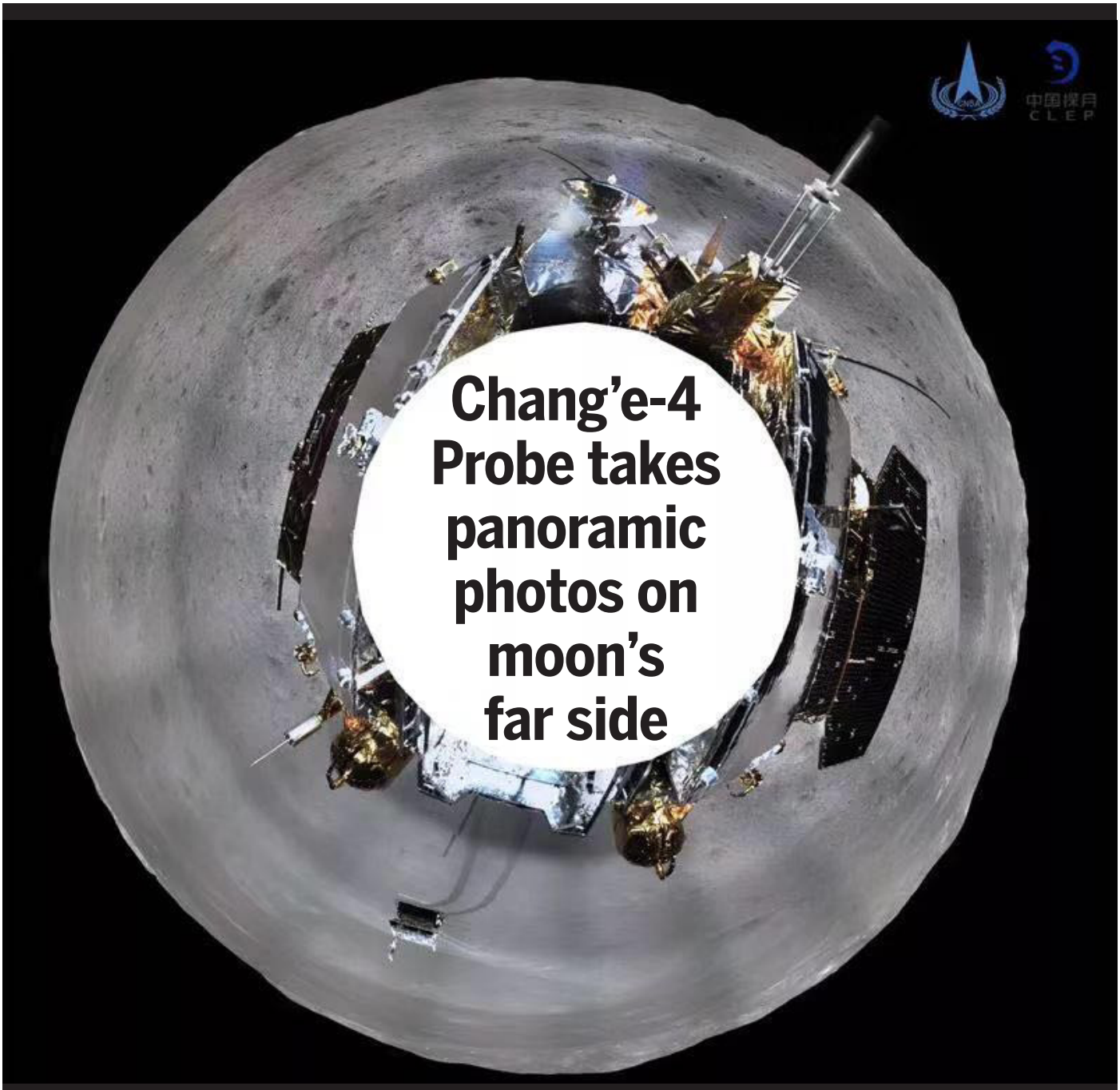
Koike and his colleagues will focus more on turning their models and scientific knowledge into practical applications for disaster relief, weather forecasting and monitoring and efficient use of water, he said.

Stenseth's work is also related to climate change, specifically its impact on diseases, genomes and biodiversity, as well as how diseases are spread. He has been collaborating with the academy for over 20 years.

"China is doing very well when it comes to scientific studies on epidemic diseases," Stenseth said, adding he obtains new and unique insights by analyzing the wealth of historical records China had kept on climate, ecology and plagues. "Understanding ecology and old diseases in wildlife is very important if you want to make predictions about human diseases."

"It is very important that China takes an ecological approach to disease management and an ecological approach to disease surveillance and monitoring." These approaches will generate more records, and help to develop precautionary action, he said.

Source: China Daily



Chang'e-4 Probe takes panoramic photos on moon's far side

China's Chang'e-4 probe took panoramic photos on the lunar surface after it successfully made the first ever soft-landing on the far side of the moon.

The China National Space Administration (CNSA) released on Jan 4, 2019 360-degree panoramic photos taken by a camera installed on the top of the lander.

The images were sent back via the relay satellite Queqiao, which is orbiting the second Lagrangian point of the earth-moon system, about 455,000 km from the earth, where it can see both the earth and the moon's far side.

Scientists have made a preliminary analysis of the terrain and landform surrounding the probe as shown in the panoramic pictures.

The Chang'e-4 probe touched down on the Von Karman Crater in the South Pole-Aitken Basin in the morning of Jan 3, and the lunar rover Yutu-2 drove onto the lunar surface late that night.

Then the rover took a "nap" as the solar radiation raised the temperature on the lunar surface to over 100 degrees centigrade. It restarted work on Jan 3.

The lander, the rover and the relay satellite are in good condition, said the CNSA.

Source: Xinhua

China makes breakthrough in atmospheric monitoring

A number of core instruments onboard the Gaofen-5 satellite recently passed an in-orbit test, marking a breakthrough for China in monitoring air pollutants, greenhouse gases and aerosols.

The three payloads -- an Environment Monitoring Instrument, a Greenhouse-gases Monitoring Instrument and a Directional Polarization Camera -- were developed by the Anhui Institute of Optics and Fine Mechanics (AIOFM).

Experts say the technologies can help reduce China's dependence on foreign satellite data on the atmospheric environment. Apart from obtaining accurate atmospheric data, the instruments can analyze the formation and development of pollution sources on the Earth's surface.

Atmospheric Environmental Monitoring Payloads of GF-5 Satellite (IMAGE FROM ANHUI INSTITUTE OF OPTICS AND FINE MECHANICS, CAS)

The Gaofen-5, used for environmental monitoring, was launched in May 2018 in northern China.

The AIOFM team still faces a number of related tasks, such as developing an ultraviolet hyper-spectral pollution-gas monitor on a high-precision greenhouse gas exploration satellite.

Source: Xinhua

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Johan Koehler, head of Solar System Science and Space Situational Awareness of the Swedish National Space Agency, said exploration of the far side of the moon was a great achievement by China. "We are very happy to be a part of it."

"There is a theory that water on the surface of the moon is formed by the interaction of solar wind with the surface regolith. So this is something that Swedish scientists together with Chinese scientists want to answer," said Koehler.

The Chang'e-4 mission, including the probe, the relay satellite Queqiao and a micro satellite orbiting the moon, has four payloads developed through international cooperation that provide opportunities for the world's scientists and combine human expertise in space exploration.

"I think one of the beauties of space science is that we do cooperate internationally. Space science to me is something important, also as a message of peace worldwide," Wimmer-Schweingruber said.

For astronomers, the far side of the moon is a place of ideal tranquility, as the body of the moon shields against radio interference from Earth. From there, they can study the origins and evolution of stars and galaxies, peering into the dawn of the universe.

Chang'e-4 carries low-frequency radio astronomical instruments developed by Chinese and Dutch scientists. "Conducting such observation on the moon's far side is a long cherished goal of astronomers, and could fill gaps in astronomical observation," said Zou.

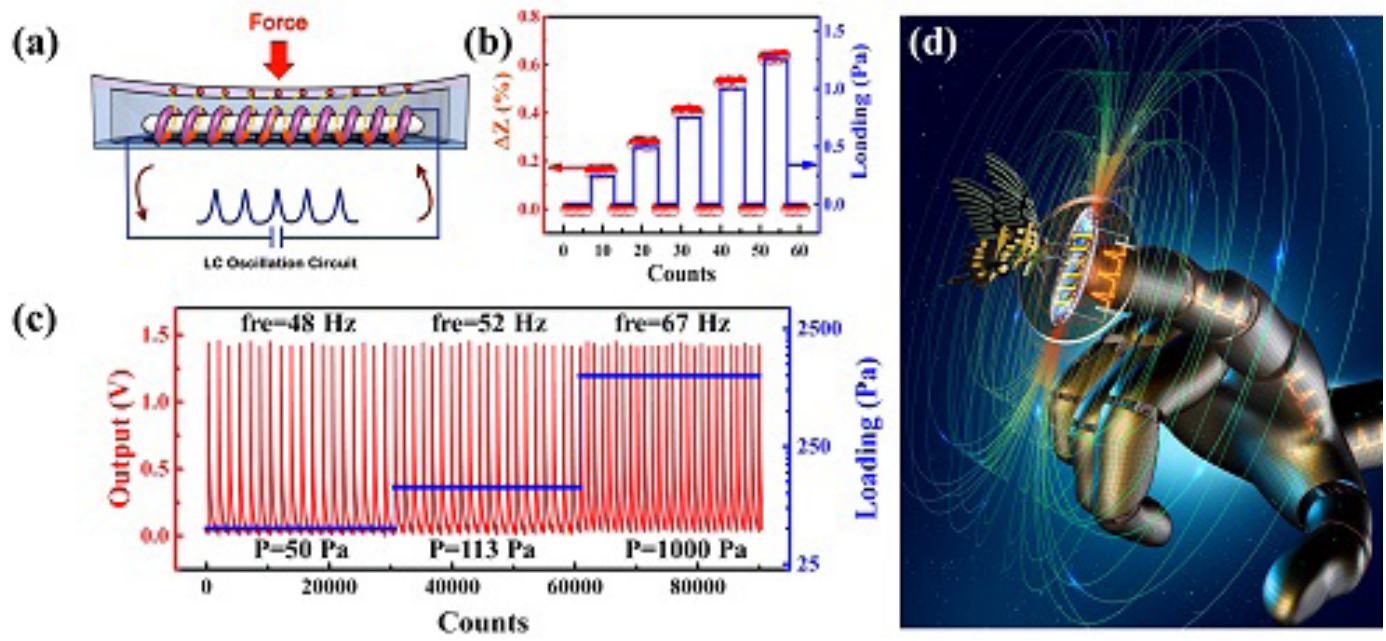
The probe also took six live species - cotton, rapeseed, potatos, arabidopsis, fruit flies and yeast - to the lifeless environment to form a mini biosphere, which is expected to produce the first flower on the moon.

Chinese space engineers also plan to get data by constantly measuring temperatures on the lunar surface.

"Exploring the far side of the moon is one contribution China is making to the world. Although we still don't know what we might find, this exploration might influence several generations," said Shen Zhenrong, a designer of the lunar rover.

Wu Weiren said: "Exploring the unknown is human nature. The moon is a mysterious world to us. We have a responsibility to explore and to understand it. Exploration of the moon will also deepen our understanding of Earth and ourselves."

Source: Xinhua



(a) Schematic illustration of the operating mechanism of the device (b) Response of the sensor to a pressure of 0.3 Pa (c) The digital-frequency response of the device changed with applied pressure (d) Schematic diagram of the sensor

Breakthrough in tactilesensors for E-skin

A research team led by Prof. Li Runwei at the Ningbo Institute of Materials Technology and Engineering (NIMTE), Chinese Academy of Sciences, in cooperation with the National Institute for Materials Science in Japan, has developed a flexible tactile sensor that could be used in electronic skins and is able to detect subtle changes such as moving ants.

Electronic skin is a system for the handicapped to restore their tactile sensation. Different from human skin, most electronic skins can only convert external stimuli into analog signals instead of physiological responses, which are transferred to the brain via the nervous system. To address this problem, Prof. Li Runwei, Assoc. Prof. Liu Yiwei and PhD candidate Wu Yuanzhao designed an LC circuit the frequency of which changes with the variation of inductance brought by external stress / strain. The researchers are confident that the circuit could be applicable to electronic skins once it is optimized in accordance with the range of physiological signals in the human body.

In addition, they designed an air gap structure with amorphous wires as its magnetic core. With this design, they developed a digital flexible tactile sensor with a sensitivity of 4.4 kPa-1 and a detection limit of 10 μN (equivalent to 0.3 Pa). By adjusting its modulus and structure, the sensor has a wider detection range. In other words, it can detect both subtle and strenuous events such as moving ants and lifting heavy weights.

With such high sensitivity and superb bionic features, the researchers believe that the tactile sensor has a potential to renovate the situation of the physically challenged by giving them an artificial "tactile organ".

This work was published in *Science Robotics (Sci. Robot.* 2018, 3, eaat0429, http://robotics.sciencemag.org/content/3/22/eaat0429.full), and it was supported by various projects and programs including the National Science Fund for Distinguished Young Scholars of China (No. 51525103), the China International Cooperation Project (No. 2016YFE0126700), the National Natural Foundation of China (Nos. 61704177, 11474295 and 61774161) and the Ningbo Science and Technology Innovation Team Program (No. 2015B11001).

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Source: Ningbo Institute of Materials Technology & Engineering, CAS

China focus: researchers discover brain functions of autism risk gene in mice

Public awareness of the impact of autism has been increasing, but there are still many aspects of the disease that are poorly understood by doctors and scientists. Chinese researchers have made a breakthrough by finding the functions of an important gene in brain development, and that its deficiency can cause autism.

Autism spectrum disorder (ASD) has been recognized as a highly heritable brain developmental disorder. It is characterized by deficits in social communication and interactions, as well as stereotyped, repetitive behaviors and restricted interests.

Sh3rf2 is a protein coding gene. Previous studies showed that it is often expressed at high levels in tumor cells. Deletion mutation of Sh3rf2, which has lost one copy and is left with a single functional copy of the gene, has been detected in autistic patients.

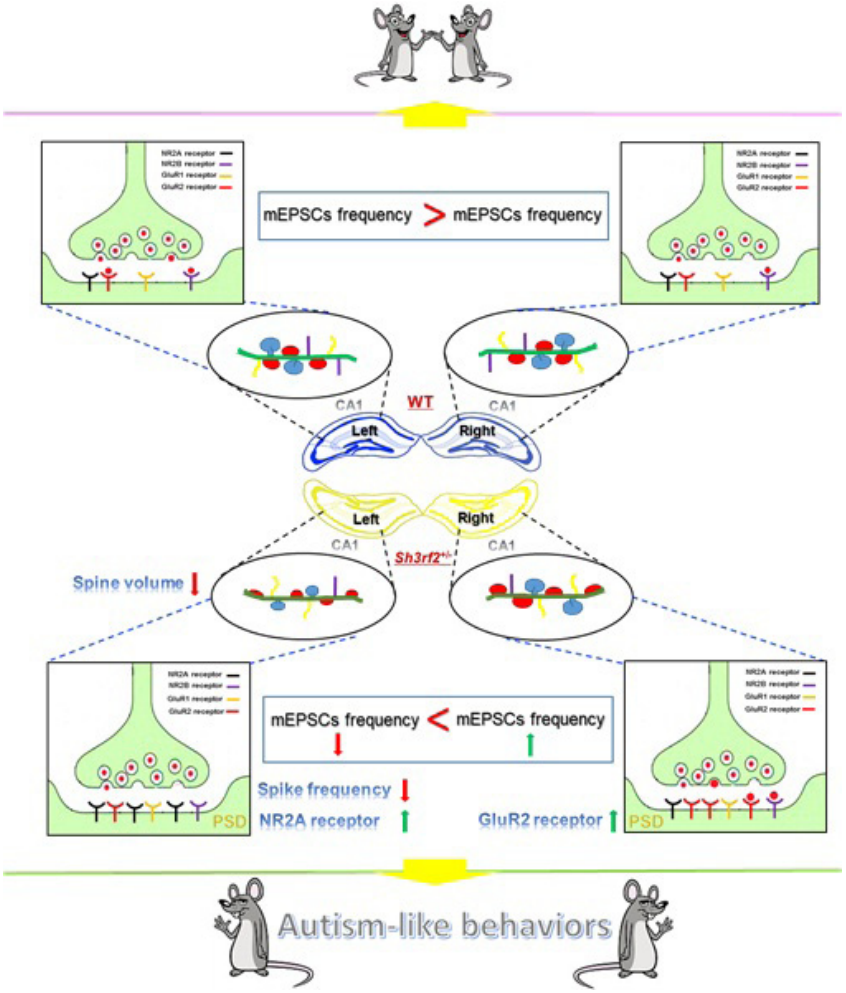
However, the role of Sh3rf2 in brain function and the underlying mechanism of how it functions remain unknown.

In experiments done on mice, researchers from the Chinese Academy of Sciences and Beijing Normal University deleted one copy of the Sh3rf2 and found that the mutation led to typical autism-related behaviors.

Mice with the mutation displayed hyperactive behaviors in their home cages, such as continuous jumping or fighting with litter mates, repetitive digging and spontaneous seizures.

Further study showed that the Sh3rf2 mutant could cause disturbances and abnormal neuronal structures and functions in the left-brain hemisphere.

The human brain is divided into two hemispheres, called the left and the right hemisphere. Each hemisphere provides a different set of functions, behaviors and controls. The right hemisphere is often called the creative side, while the left is the logical side, essential for the function of language.



Failure to develop normal language comprehension is an early sign of autism. Accordingly, left hemisphere dysfunction is often seen in autistic patients, said Xu Zhiheng, lead author and researcher with the academy's Institute of Genetics and Developmental Biology.

"These abnormalities occurred only in the left side of brain, and our findings were consistent with functional magnetic resonance images in autistic children," Xu said.

Until now, only a few ASD genes had been confirmed in animal models. Researchers think the study could help people to find out the causes of the disease and develop new drugs.

The research was published in the international journal *Cell Reports* earlier this month.

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Source: Xinhua

Five foreign scientists honored

Five foreign scientists won the 2018 International Scientific and Technological Cooperation Award of China in Beijing on Jan 8.

The five winners are US metallurgical engineer Jan Miller, UK-US molecular chemist James Fraser Stoddart, US material physicist Zhu Yimei, US ocean geochemist Peter Brewer and Swedish artificial photosynthesis specialist Sun Licheng.

Jan Miller, an academician of the US National Academy of Engineering and a professor with the University of Utah, has been committed to promoting exchanges and cooperation in metallurgical and mineral processing technologies between China and the United States and bringing international advanced mining and metallurgical technologies and development concepts to China over the past 35 years. He has also cooperated with universities, scientific research and enterprises in China's mining and metallurgical industry, making outstanding contributions to the development of modern mining and metallurgical technology and personnel training in the country.

Nobel Prize laureate in Chemistry Stoddart, a foreign academician of the Chinese Academy of Sciences (CAS) and a recipient of the 2017 Friendship Award granted by the Chinese government, has devoted himself to promoting scientific and technological cooperation between China and the US and actively carrying out exchanges and cooperation with Chinese scholars in molecular science.

Moreover, he set up funds to encourage more outstanding young Chinese talents to engage in chemical research and hosted high-level academic conferences in China, making important contributions to frontier research, personnel training and first-class discipline construction.

Zhu Yimei, a tenured scientist at the Brookhaven National Laboratory of the United States, has been applying himself to promoting intergovernmental scientific and technological exchanges and cooperation between China and the US. Entrusted by the US Department of Energy, he has organized bilateral seminars on high-specification superconductors and quantum materials, and developed new fields and cooperation mechanism between CAS and the US Department of Energy.

As a recipient of the International Scientific Cooperation Award of the Chinese Academy of Sciences 2017, Zhu has also contributed to the technological progress of atomic scale characterization and electronic microscopy, as well as the construction of several large advanced research platforms in China.

Peter Brewer, a senior scientist at the Monterey Bay Aquarium Research Institute in the US, has been cooperating with Chinese scientists for nearly ten years to promote deep-sea exploration technology in China. In addition to CAS, he also associated with Peking University, Xiamen University, and Ocean University of China to promote the leap-forward development of deep-sea research in China. Brewer won the Award for International Scientific Cooperation of the Chinese Academy of Sciences 2017.

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Allium research center opens to public in SW China

A research center for allium, a plant genus which includes garlic and onions, has been opened to the public in Kunming Botanical Garden, southwest China's Yunnan province.

The Kunming Center of the China-Uzbekistan Global Allium Garden was jointly built by the Kunming Institute of Botany of the Chinese Academy of Sciences (CAS) and the Institute of Botany at the Academy of Sciences of Uzbekistan.

The garden is engaged in the collection, conservation, and exhibition of allium, and also provides support for allium research, utilization, and public education. It is expected to be a global base for wild allium preservation.

The Kunming Center has collected at least 65 allium species, while the other center of the global allium garden, in Uzbekistan's capital Tashkent, has collected more than 100 species.

There are more than 500 allium species around the world. China has over 100 of them.

Uzbekistan is an important origin of garlic and onions, which play an important role as flavoring in cooking, as well as medicine. "Their resistance to drought, coldness, and pests make them suitable for gardening," said Sun Weibang, a researcher of the Kunming Institute of Botany.

"Garlic was also one of the spices shared along the ancient Silk Road," said Sun.

Source: Xinhua

A Journey to FAST: the Eye of Heaven

I am Bhusan Kayastha from Nepal, a PhD student at National Astronomical Observatories of the Chinese Academy of Sciences (NAOC). I am a CAS-TWAS President's Fellow at the University of the Chinese Academy of Sciences (UCAS). Every year, the International College of UCAS (IC-UCAS) organizes a Winter School on Frontier and Interdisciplinary Sciences for the international students of UCAS focusing on the pertinence and crossover of subjects as well as scientific- educational integration. This year, NAOC and the FAST Observatory hosted the Winter School from January 10 – 15 at Pingtang County, Guizhou to present students with cutting-edge theories and research methods in astronomy and physical engineering.

Bhusan Kayastha and Sunayana Maben, PhD students from NAOC at the FAST site

As an astrophysicist, I was already excited about visiting the FAST station when I heard about its opening ceremony in September, 2016. As soon as this year's Winter School was announced and I learned that it was going to be held at the FAST station, it was like a dream come true. With great excitement in our hearts, I and 41 other students from UCAS, along with our teachers, landed at the Guiyang International Airport. The weather was cold, and the beautiful mountains were surrounded by fog. We crossed many mountains and tunnels during our 150km road trip to reach the Pingtang Astronomical Town. It was almost evening when we arrived at the Winter School venue. As soon as we went through the gate of our hotel we could feel the astronomical ambience with telescopes and paintings of the solar system in the lobby. It was such a nice environment somewhere deep in the mountains of Guizhou.

FAST stands for Five-hundred-meter Aperture Spherical Radio Telescope. It is the world's largest and most sensitive filled-aperture radio telescope. Located in the Dawodang depression, a natural basin in Pingtang County, Guizhou province, China, it consists of a fixed 500 m diameter dish constructed in a natural depression.

The Winter School started with a welcoming speech by Prof. Dr. Gang Zhao, Legal Representative and Executive Deputy Director-General of NAOC. Over the following days there were presentations and lectures related to astronomy by various professors.

On the second day, during the breakfast at the hotel restaurant, I met some junior high school students on a school tour of the FAST observatory from Guangzhou Baiyun Experimental School. They had already been to the FAST site a day before. I had a conversation with them and I asked them about their feelings after visiting the FAST station. One of the students, Zhang Yiting, who is 13 years old, said "We are a group of 23 students and we came here on a 4-day tour from Guangzhou. When I saw the FAST site, it was like a big golf ball surrounded by many towers. We went around the telescope - it was like walking on a bridge. I feel proud of my country; it is the largest telescope in the world. I want to be an astronomer now and want to use this instrument to find new stars in the future".

On the same day, we had the most exciting part of the Winter School – the tour of the FAST station. The FAST observatory imposes radio silence within a 5km radius so we were not allowed to carry any mobile phones with us. While we were walking towards the FAST site, from far away I saw a big tower more than 100 meters tall. As we went nearer, I saw a big white circular dish of 500 meters diameter surrounded by six tall towers with a height of more than 100 meters. The circular dish was constructed by joining many small triangular plates with a receiver in the center connected by cables to the six surrounding towers. There is a bridge-like walking path supported by pillars to the ground around the circular dish where visitors can walk. The construction of FAST started in June, 2011,

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and was completed in September, 2016. It is still going through the final stage of construction and will be completed by September, 2019.

As of January, 2019 FAST has discovered 74 new pulsars, 54 of which have been verified through radio telescopes in other countries. Everyone was excited and happy to see the largest radio telescope in the world. We took many pictures and filmed the "New Year Greetings of UCAS" for the upcoming Spring Festival -- the Chinese New Year. This year marks the 70th anniversary of the founding of the People's Republic of China, and I believe FAST is one of the landmark achievements of the Chinese people in these years.

In the evening, we went to see the light show at the Pingtang Astronomical Town. The whole city was glowing. There were street lamps which looked like flying saucers and UFOs. There was music coming from a building which looked like a space station with a lighting system designed as a tree in the middle. There was a Milky Way section near the river with big bulbs representing Saturn and Jupiter. To be in such a nice astronomical ambience in the midst of the mountains nearby the lake made us extremely happy.

The planetarium was in the middle of the Astronomical Town; we visited it the next day. It was like visiting a museum introducing different aspects of astronomy like the history of radio astronomy and of the solar system, the evolution of the universe from the big bang, black holes, spaceships, rockets and much more. It was the first time in my life that I saw a movie in a golf ball shaped hall with 3D effects. Where else on earth will you encounter an astronomical town, a hotel filled with astronomical atmosphere and a telescope on the balcony of every room? This is the Pingtang Astronomical Town in Guizhou.

The Winter School ended with a dinner program and special performances from the Bouyei ethnic minority group of Guizhou and the participating international students of UCAS. This Winter School was a good platform to learn about astronomy and get a practical feeling of the FAST observatory. The school made it possible for students from different scientific fields and institutes of the Chinese Academy of Sciences to come together and share their ideas. It was a very fruitful Winter School for us and we had the experience of a lifetime. I would like to sincerely thank NAOC, the FAST Observatory, UCAS, CAS and all the teachers for giving us such a wonderful opportunity.

FAST Observatory at Guizhou, China

Night View of the Pingtang Astronomical Town

Source: NAOC

China launches comprehensive reef research center on Nansha Islands

The Chinese Academy of Sciences (CAS) has launched an Integrated Research Center for Reefs and Islands Sciences on Meiji Reef, Nansha Islands, in the South China Sea.

The center will become an on-site test base to conduct studies on the ecology, geology, environment, materials and ocean energy of tropical seas, according to CAS.

It is of global significance to carry out in-depth research on the marine sciences in the South China Sea, which has many islands, diverse ecosystems and rich ocean resources, experts said.

The center has multiple functional laboratories in related fields such as ecology, geology, environmental studies, and anti-corrosion.

Source: Xinhua

Discovering the beauty of science

The Chinese Academy of Sciences (CAS) hosted an image competition to foster youth's innovation consciousness and inspire their enthusiasm for scientific research.

The young CAS scientists captured the amazing images with keen perspectives and fertile imaginations and demonstrated the unique charm of scientific research. Let's take a closer look at what they found.

A reflection of labor

PHOTO BY WANG GUANQIN, INSTITUTE OF BOTANY, CAS

In early July 2017, Wang Guanqin and his colleagues, together with some workers, built a climate-modeling experimental platform at a site 3,900 meters above sea level on the Qinghai-Tibet Plateau to simulate global warming.

The photo was captured in the afternoon after a cold day of heavy rain, when they were working hard on a tight schedule. Wang happened to see the figure of his fellows and workers against an acrylic device when he was installing a panel.

The device reflected their hard work under a clear blue sky dotted with white clouds, creating a precious photo that records the researchers' efforts to explore nature and protect the home of all human beings.

Yao Tandong, head of the CAS Institute of Tibetan Plateau Research, and his team braved hardship and dangers to inspect the avalanche of ice in Ali prefecture, Tibet, Sept 28 - Oct 5, 2016. Two devastating ice-falls had occurred in the area between July 17 and Sept 21, 2016.

Wang said he was deeply touched by the scene and glad he was there to capture it. "The dazzling sunshine and the standing iceberg are not as encouraging as the researchers in red in front of me. I think that only a truly great scientist can climb the summit bravely in pursuit of the truth of science by taking risks," he added.

A light in the distance

PHOTO BY ZHANG MIAO, SHANGHAI INSTITUTE OF APPLIED PHYSICS, CAS

The photo shows the first China-developed proton therapy demonstration device, a quadrupole magnet. The developers' ingenious design, construction and precise alignment ensure the magnets' extraction of high-quality beams, and enable cancer patients suffering from illness to see the "light" of hope of a cure. The research team who participated in the project made joint efforts to pursue that distant "light".

Source: Voice of Youth, Chinese Academy of Sciences

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Sun Licheng is an academician of the Royal Swedish Academy of Engineering Sciences and the chief professor of molecular device at the KTH Royal Institute of Technology. He began to conduct scientific and technological cooperation with China in 2000 and launched a research center of artificial photosynthesis in Dalian University of Technology.

Over the past 18 years, Sun has been promoting international cooperation on technology and research into artificial photosynthesis in China, making great contributions to China's presence in the field's frontier research.

Source: chinanews.com