

CHINA

FAST closes in on radio burst mystery in sky

Astronomers using sensitive Chinese telescope achieve breakthrough

By ZHANG ZHIHAO
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Astronomers using China's Five-hundred-meter Aperture Spherical Telescope have made major progress in solving the mysteries of extremely short but powerful flashes in the sky known as fast radio bursts, according to studies published in the journal Nature.

Data collected by the world's largest single-dish radio telescope suggests fast radio bursts originate from activity in the magnetosphere of neutron stars — the super-dense remnants of massive stars. The finding concludes a decade-long scientific debate on the origin of the phenomenon, which was first discovered in 2007.

Scientists have also hypothesized that most fast radio bursts may be emitted by a special class of neutron stars called magnetars that have extremely strong magnetic fields. The most magnetic stars in the universe, they have a field strength up to a thousand trillion times stronger than that of Earth.

However, there may also be other origins, they added.

"Fast radio bursts are one of the frontiers in astronomy because they are full of interesting questions to be answered," said Han Jinlin, a chief researcher at the National Astronomical Observatories of the Chinese Academy of Sciences.

"Unlike other celestial objects that can be tracked and monitored, FRBs blink and disappear within thousandths of a second, making them a notoriously elusive and difficult phenomenon to study."

He said some fast radio bursts can even recur after some time, which is a further puzzle for scientists.

"Only in the past few years have scientists known how to locate FRBs, but it remains a challenge to decipher their signals and understand the physics behind them because many telescopes simply aren't sensitive enough," Han said. That is where FAST — the world's

most sensitive single-dish radio telescope — can shine, said Lee Kejia, an astronomy professor at Peking University, as it is 2.5 times more sensitive than the 305-meter-diameter Arecibo telescope in Puerto Rico, which is in second place.

Lee and his team used the telescope in Guizhou province to observe a repeating fast radio burst called FRB180301 and discovered that the radiation of the source has "very diverse polarization angle swings", meaning that the radiation is affected by the magnetosphere.

This supports the hypothesis that fast radio bursts originate from complex processes in a neutron star's magnetosphere, rather than from the collision of accelerated particles, according to a study published in Nature last month.

Another study published in Nature on Thursday said that Chinese astronomers used FAST to observe a magnetar called SGR 1935+2154, and concluded that the hyper-magnetic objects could be a major source of fast radio bursts.

Jiang Peng, FAST's chief engineer, said the two discoveries are in keeping with public expectations that the telescope will deliver influential and original breakthroughs.

FAST has discovered more than 240 pulsars — super dense stars that emit electromagnetic beams at precise intervals, Jiang said. Pulsars are a popular research subject as the "cosmic lighthouses" allow scientists to study extreme states of matter, measure cosmic distances and track time in an ultraprecise way.

Scientists have published over 40 high-quality papers using data collected by FAST, and Chinese astronomers are lining up to apply to use it for their research, he said.

"Not only does it play a significant role in our nation's effort to create major original breakthroughs in astronomy, but the engineering techniques and materials used to create this monumental infrastructure can also serve other industries, such as high-precision surveying," he said.

Fruitful endeavor



A farmer carries a box of persimmons that will be processed into dried fruit in Cixian county, Hebei province, on Tuesday. Dried persimmons are one of the county's major agricultural products. FAN SHIHUI / XINHUA

Ministry blasts planned \$600m sale of four drones to Taiwan by US

By ZHANG ZHIHAO
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The Chinese military strongly condemned the United States for its plan to sell four MQ-9 drones worth \$600 million to Taiwan, Senior Colonel Wu Qian, spokesman of the Ministry of National Defense, said on Wednesday.

The US State Department notified Congress on Tuesday of its plan to sell four MQ-9B Reaper drones and related hardware to Taiwan. The deal, which awaits congressional approval, is the latest arms package to be offered to the island, following a \$2.37 billion sale of Harpoon missile systems and a \$1.8 billion package including rocket launchers, sensors and artillery last month.

Wu said the move has seriously violated China's sovereignty, safety and territorial integrity. It has also challenged China's core interests

and disrupted China-US military relations and bilateral ties as well as peace and stability in the Taiwan Straits, he added.

"Any attempt to use Taiwan to pressure China and use military force to resist reunification is like a mantis trying to stop a chariot and is doomed to fail," Wu said.

"We urge the US to recognize the severity of arms deals with Taiwan and immediately stop any planned deals and military communication," he said, adding the US should carefully handle the Taiwan question to avoid "incalculable and severe consequences".

"Those who play with fire will get burned," Wu said. "The People's Liberation Army will never allow anyone or any forces to separate the nation's sacred territory. If anyone insists on having their own way, we will absolutely strike back head on."

Foreign Ministry spokesman Wang Wenbin said the US arms sale has violated the one-China principle and the three China-US joint communiques, especially the August 17 Communiqué.

"It is crude meddling in China's domestic affairs and has severely undermined China's sovereignty and security interests," Wang said.

Zhu Fenglian, a spokeswoman for the State Council Taiwan Affairs Office, said China firmly opposes US arms sales to the island, adding the deal has sent a wrong signal to Taiwan separatist forces.

The island's ruling Democratic Progressive Party is seeking secession by force, and its actions will push the Taiwan people toward disaster, she said.

Zhang Yi and Zhou Jim contributed to this story.

Briefly

SHAANXI 8 missing after gas outburst at coal mine

Eight miners are missing after a suspected gas outburst at a coal mine in Shaanxi province on Wednesday, the local government said. The accident occurred at about 1 pm in Tongchuan, Shaanxi, when 42 miners were working underground. Thirty-four were lifted to safety, and a rescue operation to save the others is underway. The Tongchuan government's emergency management department said the city's leaders arrived at the scene to lead the rescue effort, which involves departments including emergency management, health and fire services.

SHANDONG Ex-prison officials admit malpractice

Three former prison officials in Shandong province pleaded guilty to malpractice at their trials on Wednesday after their behavior led to dozens of inmates and staff members being infected with novel coronavirus early this year. The three defendants were Wang Wenjie, former deputy director of the province's prison administration, Liu Baoshan, the former head of Rencheng Prison, and Deng Tihai, its former deputy head. Prosecutors said Wang, who had been responsible for handling, coordinating and preventing COVID-19 in the provincial prison system since Jan 23, should be held criminally liable for failing to realize the sensitivity and complexity of epidemic control in prisons, dropping his guard and exercising a lack of supervision in the fight against the outbreak. Prosecutors charged Liu and Deng with malpractice for failing to strictly check the health condition of staff members at the prison and failing to properly control gatherings and movements of inmates.

XINJIANG Building of rail bridge in desert on track

The construction of an 8.6-kilometer railway bridge in the Taklimakan Desert, China's largest desert, will be completed by the end of this month, its builders said. The Yimlakut Bridge is the longest of the Hotan-Ruoqiang Railway's five bridges built over sand, which in total account for 53.7 km of the 825-km railway in the Xinjiang Uygur autonomous region. The bridge covers a section of the Taklimakan Desert where sand dunes move an average of 20 meters a year, said Zhang Gang, a project manager with the China Railway 14th Bureau Group, which is overseeing the line's construction.

XINHUA — CHINA DAILY

Together again



Chai Guoqing, 64, hugs his mother Xia Xiaopang, 91, as they reunite in Yixing, Jiangsu province, on Tuesday. Xia abandoned Chai in 1960 during a severe famine in Shanghai but has regretted doing so ever since and tried to find him. Chai, now living in Handan, Hebei province, had been looking for his original family since 2008. In September, volunteers helped Xia take a blood sample and send it to a database, where Chai had already submitted a sample. Their DNA matched. DING HUANXIN / FOR CHINA DAILY

Campaign to fight illegal fishing in Yangtze proving effective

By WANG XIAODONG
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Nationwide sales of illegally caught aquatic products from the Yangtze River have been effectively curbed following a special law enforcement campaign ahead of the implementation of a 10-year fishing ban in the river, the country's top market regulator said on Wednesday.

The campaign began in July. Yu Jun, spokesman of the State Administration for Market Regulation, said at a news conference that by the end of last month, market regulation authorities nationwide had completed more than 3.6 million

inspections of various businesses related to aquatic products, including processors, food markets and restaurants.

They also conducted more than 2.3 million surveillance operations of various e-commerce platforms and urged the operators to remove 24,800 pieces of information regarding illegal trading of aquatic products related to the Yangtze, he said.

Market regulation authorities have handled 711 cases involving related violations since the beginning of the campaign, with more than 1,700 kilograms of aquatic products and 140 kg of endangered

aquatic wildlife confiscated, he said.

The campaign was launched ahead of a strict fishing ban that takes effect on Jan 1. The ban outlaws nearly all types of fishing — except for scientific research — in the main channel of Asia's longest river, and in its major branches and two major lakes connected to it, for the next 10 years. The effort is aimed at restoring the deteriorating ecology of the Yangtze River due to overfishing.

The Yangtze used to teem with aquatic life. Illegal fishing and sales of wildlife from the river still occur in some areas along the waterway despite laws and regulations.

With intensified law enforcement

following the launch of the campaign, illegal activities such as selling aquatic products taken from the river have been significantly suppressed, Yu said.

Between Sept 20 and 30, a special team dispatched by the administration conducted undercover inspections in 12 provinces, municipalities and an autonomous region along or near the river, including Shanghai and Anhui and Hubei provinces, covering 88 wholesale food markets, 121 shopping malls and supermarkets and 186 catering businesses, he said.

The team found most of the aquatic products sold in such places

and the provinces of Shandong and Jiangsu, temperatures will be roughly the same as average or 1C to 2 C higher.

It added that long-lasting and large-scale freezing weather or snowstorms will be less likely to occur in the south this winter, but shorter episodes of such weather will be witnessed.

Meanwhile, 20 percent to 50 percent more precipitation than normal will batter North China this winter, while in the south it will decrease by the same amount, the forecast said.

It added that atmospheric conditions to diffuse pollution — a way of evaluating whether air pollutants will be able to thin out quickly — will be nearly the same as the average level of the past five years.

Forecasters predict winter will be colder

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China's winter — from December to February — will be chillier than usual according to a nationwide weather outlook released by authorities on Wednesday.

The forecast, made jointly by the National Climate Center and the Ministry of Water Resources, said cold air will be frequent in the northwestern and southern parts of China, including the provinces of Gansu, Qinghai, Shaanxi and Guizhou as well as the Xinjiang Uygur and Guangxi Zhuang autonomous regions, with temperatures an average of 1C to 2C lower than in previous winters.

For the rest of the country, including northeastern provinces, Beijing

"Due to the influence of cold air from the west, atmospheric conditions to diffuse pollution in northern parts, including the Beijing-Tianjin-Hebei province cluster and the Fenhe-Weihe Plain region, will not worsen and will stay the same as the past five-year average," Jia Xiaolong, deputy head of the center, told a news conference on Wednesday.

"However, in areas along the Yangtze River, conditions will be worse than before."

He warned residents of western and southern parts of the country to pay attention to the adverse effects of cold weather on traffic, electricity and spring farming. He also stressed that people in other regions will need to protect themselves from air pollution.