CHINA

Fishing fleets

Distant-water fishing vessels depart in an orderly manner from the Shawo Island fishery base in Rongcheng, Shandong province, on Monday. Around 100 such vessels are expected to embark on journeys to the Atlantic and Indian oceans, marking a record high in outbound fishing operations this year. Sixteen vessels will target squid in the Atlantic Ocean and return in two years, while over 80 vessels head to the Indian Ocean for squid and tuna, and are expected back by June next year. LI XINJUN / FOR CHINA DAILY

Private rocket-making firms eye reusability as key growth driver

Deployment of satellite systems behind surging demand, company official says

By ZHAO LEI
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As a growing number of Chinese private rocket manufacturing companies develop their own launch vehicles, reusability has emerged as a make-or-break factor for their survival and growth.

Galactic Energy, a Beijing-based rocket maker, cleared this critical threshold with the successful maiden flight of its Pallas 1 liquid-propellant rocket, which is designed for reuse.

The launch took place on Sept 1 morning at the Jiuquan Satellite Launch Center in the Inner Mongolia autonomous region. The 52-meter rocket lifted off from its dedicated launch tower and soon reached a predetermined orbit, according to Galactic Energy.

The Pallas 1 is the 50th type of carrier rocket China has developed and flown, and the 12th private rocket built and used in the country.

The company said it will use the Pallas 1 to secure orders for large-scale constellation deployment and heavyweight satellite launch services.

The new rocket has a two-stage configuration with an optional upper stage. It has a core-stage diameter of 3.35 meters, a liftoff weight of about 283 metric tons and a liftoff thrust of 350 tons.

The rocket's first stage is powered by seven CQ-50 reusable engines that run on liquid oxygen and kerosene.

According to its designers, the configuration provides substantial fault redundancy while supporting recovery and reuse. If one engine malfunctions, the remaining six can still sustain the flight mission.

Galactic Energy said the Pallas 1 is capable of carrying up to 7 tons of payload to low-Earth orbit, enabling it to meet major demand from commercial satellite operators deploying satellites in such orbits.

Xia Dongkun, executive president of Galactic Energy, said the maiden flight was only the first step toward making the rocket reusable. The mission was deemed successful because it demonstrated that the rocket could reach its intended orbit.

"The second step will involve the gradual verification of first-stage reentry control, grid fin operation, braking deceleration and fixed-point recovery at sea or on land in subsequent flight missions, to realize full vertical landing recovery of the first stage.

"And then the rocket will start high-frequency flight missions while we will continue optimizing reuse and maintenance procedures to keep reducing costs and improving reuse cycles," he said.

Designed for reuse at least 25 times, the Pallas 1 is expected to become a high-efficiency, low-cost "space shuttle" for commercial satellite companies, according to Galactic Energy.

"China is advancing the development and deployment of multiple massive satellite systems, leading to surging demand for rockets. The country is currently faced with a situation of 'more satellites than rockets'. If we rely on expendable rockets, it will be difficult to match production and launch paces," Xia said.

He explained that rocket reusability refers to the recovery and reuse of a rocket's first-stage booster, its most valuable part.

The first stage accounts for about 70 percent of a rocket's launch cost. As a result, the ability to recover the first stage and return it to the launch pad after maintenance and testing can significantly reduce the marginal launch cost of each rocket and shorten the launch cycle, Xia added.

Since the beginning of this year, China has achieved pivotal milestones in reusable rocket technology, with State-backed and commercial players pursuing parallel recovery approaches to meet surging demand for rockets to deploy large-scale satellite networks.

In July, the Long March 10B, a model developed by State-owned conglomerate China Aerospace Science and Technology Corp, completed the world's first sea-based net-capture recovery of an orbital rocket's first stage.

Launched from the Hainan International Commercial Aerospace Launch Center in Wenchang, Hainan province, the mission marked China's first successful controlled recovery of a carrier rocket. The Long March 10B has become the world's third rocket model to complete all key steps of a full recovery profile: controlled return flight, vertical terminal descent and intact retrieval.

In August, leading private rocket maker LandSpace's ZQ 3 rocket achieved China's first land-based rocket recovery.

Meanwhile, other private companies have been sparing no effort to develop their own reusable rockets in an effort to seize booming business opportunities.

For instance, Space Pioneer is refining its heavy-lift TL 3 reusable rocket following a failed test flight in April, while fellow private firm i-Space has completed key ground validations for its Hyperbola 3 rocket, which is slated for its maiden flight with sea recovery capability later in the year.

Before developing the Pallas 1, Galactic Energy had developed two models, Ceres 1 and Ceres 2, and used them to conduct 24 launches, sending nearly 90 satellites into various orbits.

Satellites track glaciers for hazards in Xizang

By LI MUYUN and **HE CHUN**
in Changsha

Chinese commercial satellites are stepping up monitoring of glaciers upstream from Gyirong Port in the Xizang autonomous region, looking for cracks and surface shifts that could signal further hazards as rescue operations continue following the Aug 26 mudslide.

Three Synthetic Aperture Radar, or SAR, satellites operated by Spacety, a commercial aerospace company based in Changsha, Hunan province, are providing updated imagery to the rescue command center in Gyirong county, Shigatse. The satellites have already been used to monitor two barrier lakes and assess damage to National Highway G216 in the disaster-hit area.

The latest focus is the glacier area upstream, where the team is using satellite imagery to track changes in the ice surface and identify potential risks, said Jiang Lin, a satellite engineer with the company who is working at the front-line rescue command center.

"If we spot a potential risk, the data will be provided to the rescue command center for further ground-based checks," Jiang said. "By combining satellite technology with ground information, we have built a multilayered monitoring system to provide timely and accurate information for rescue operations."

The team has also introduced Interferometric Synthetic Aperture Radar, or InSAR, technology to improve its ability to detect surface deformation. By comparing radar images of the same area taken at different times, the technology can detect ground movement at the millimeter-to-centimeter scale and cover large areas without requiring monitoring equipment to be installed on the ground.

SAR technology is particularly useful in Gyirong's mountainous terrain as it can operate at night and penetrate clouds and rain that may obstruct optical satellite observations.

"Think of SAR satellites as CT scanners for the Earth," Jiang said. "As the satellite moves along its orbit, it actively transmits microwave signals to create high-resolution images, even in heavy rain or at midnight."

Spacety joined the emergency response shortly after the mudslide hit the Gyirong Port area. Within 20 minutes of receiving a request for support, the team adjusted its satellite imaging plans to prioritize the affected area, Jiang said.

The first SAR images were obtained in the early hours of Aug 27. Jiang and his colleagues arrived at the rescue command center later that day to coordinate satellite observations with the needs of teams on the ground.

Satellite imagery obtained on Aug 27 and Aug 28 identified two barrier lakes, helping rescuers assess potential flooding risks downstream. In SAR images, water surfaces appear dark, while debris and damaged slopes appear brighter, allowing analysts to identify the lakes and assess their extent, Jiang said.

The satellites have also captured damaged sections of National Highway G216 near Gyirong Port, providing imagery of road-clearing routes and excavation work.

With three satellites passing over the affected area at different times and from different angles, the team can repeatedly update observations of key sites, providing rescuers with a more complete picture of changing conditions.

"By working here with the front-line rescue teams, we can understand their needs firsthand and respond as quickly as possible," Jiang said. "We aim to bridge the last mile between space technology and rescue operations."

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Landslide relief

Li Gaosheng (left), a village official of Mingkeng village, checks on the meals served to residents at a temporary relocation shelter in Shangyou county, Jiangxi province, on Monday. The shelter now has 203 villagers after a landslide struck on Saturday. WAN XIANG / XINHUA

China pledges to advance biodiversity protection

By YAN YUJIE in Kunming
and **HOU LIQIANG** in Beijing

China has made solid progress in implementing the Kunming-Montreal Global Biodiversity Framework and will continue to strengthen biodiversity protection at home and abroad, Minister of Ecology and Environment Huang Runqiu said on Monday.

Speaking at the opening ceremony of the Kunming Dialogue on Collective Progress in the Implementation of the Kunming-Montreal Global Biodiversity Framework in Support of the Global Review, Huang said China has made significant progress on 21 of the framework's 27 national targets.

Adopted at COP15 — or the 15th meeting of the Conference of the Parties to the Convention on Biological Diversity — in late 2022 under China's presidency, the framework sets four long-term goals for 2050 and 23 action-oriented targets for 2030.

Since COP15, China has issued guidelines on further strengthening biodiversity conservation, advanced a national park-based protected area system and drawn red lines for ecological conservation, Huang said.

More than 30 percent of China's land area now falls within those red lines, covering 95 percent of the country's rare and endangered species and their habitats, he said.

China has also continued to implement major biodiversity conservation and ecological restoration projects. Nearly 500 wild plant and animal species in the country have seen their threat status downgraded, while the populations of more than 300 rare and endangered wild species have steadily increased, Huang said.

Beyond its domestic efforts, China has continued to participate in global biodiversity governance. At the COP15 leaders' summit, China announced the establishment of the Kunming Biodiversity Fund with an initial contribution of 1.5 billion yuan ($223.5 million). So far, the fund has approved two batches of 31 projects benefiting 45 developing countries, Huang said.

Global action to implement the framework is moving forward, Huang said, but the current pace is still insufficient to meet the 2030 goals. "How to translate goals and commitments into governance results, and into practical outcomes that protect nature and benefit people, is a common task before us all," he said.

The first global report on progress under the framework, a major component of the Kunming Dialogue, shows that countries are stepping up efforts to implement the framework, but significant gaps remain, according to officials attending the event.

At a news conference on the sidelines of the event on Monday, Zhang Yujun, head of the nature and eco-conservation department at the Ministry of Ecology and Environment, said 172 parties had set national targets aligned with the framework, while 107 parties had updated their national biodiversity strategies and action plans.

"Efforts in ecological protection and restoration worldwide have been further strengthened, with an additional 193 million hectares of land placed under ecological restoration," Zhang said.

Addressing the opening ceremony, Astrid Schomaker, executive secretary of the Convention on Biological Diversity, said the report showed "unprecedented engagement" driven by the Kunming-Montreal framework.

"But the world is not yet moving at the scale and pace needed to achieve the targets by 2030," Schomaker said, adding that biodiversity finance, capacity-building, monitoring plans and stronger national commitments are still needed where implementation gaps remain.

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Primate's face-dominance trait studied

By WANG SONGSONG
and **QIN FENG**

Male golden snub-nosed monkeys with wider faces relative to facial height are more aggressive and more likely to win fights, according to a new study that offers fresh insights into how primates may use physical traits to signal dominance.

The study, recently published in the journal Animal Behaviour, was based on two years and eight months of fieldwork in the Qinling Mountains of central China. Zhang Pei, an associate professor at Northwest University and first author of the study, recorded more than 1,600 conflict events involving 15 dominant males and measured the facial width-to-height ratio, or fWHR, of 126 monkeys.

The results showed that adult males with a higher fWHR initiated significantly more aggressive interactions and won a greater proportion of their fights, even after the researchers accounted for confounding factors such as body weight and harem group size. Other factors, including age and the advantage of striking first, also predicted the outcome of fights.

However, the study found no evidence that males deliberately targeted rivals with narrower faces. This suggests that fWHR may function primarily as a signal of the bearer's own fighting ability, rather than as a cue that rivals use to assess opponents and avoid costly conflicts.

"Our results indicate that facial width-to-height ratio serves as an honest signal of aggressiveness and fighting ability in male golden snub-nosed monkeys. However, we still need to determine whether this facial feature actually deters potential challengers before a contest begins," the paper said.

The study also documented a developmental reversal in sexual dimorphism. Subadult females had wider faces than males of the same age, but in adulthood, males had a significantly higher fWHR than females. The shift coincides with the onset of intense male-male competition for mating opportunities.

"We speculate that the link between facial width-to-height ratio and aggressiveness and fighting ability is not unique to a particular species, but is likely a general pattern across primates," Zhang told China Science Daily in a report published on Saturday.

Golden snub-nosed monkeys live in a complex multilevel society in which multiple family units travel and forage together as a large breeding band, often followed by all-male groups seeking to take over individual units. Given the high stakes of male competition, researchers suggest that signals linked to facial structure may have evolved to help reduce costly physical fights.

The researchers noted that about half of the offspring are not sired by the resident male, further intensifying competition among males for mating opportunities.

However, the team found no direct evidence that resident males more frequently initiated aggression toward adult males with a smaller fWHR.

Further research is therefore needed to determine the extent to which fWHR serves as an honest signal that can deter potential opponents and reduce conflict before physical contests begin.

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