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All smiles in space

The crews of the Shenzhou XIX and Shenzhou XX manned spaceships pose for a group photo in the Tiangong space station on Friday. The three astronauts aboard China's Shenzhou XX spaceship entered the country's space station and met with their fellow astronaut trio in the early hours of Friday, starting their in-orbit crew handover. XU BU / FOR CHINA DAILY See story, page 3

Shenzhou XX crew members start takeover of Tiangong

By ZHAO LEI
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Shenzhou XX crew members have begun to carry out takeover work of the Tiangong space station with the outgoing Shenzhou XIX astronauts.

The new arrivals — mission commander Senior Colonel Chen Dong and crew members Colonel Chen Zhongrui and Colonel Wang Jie — were launched by a Long March 2F carrier rocket on Thursday afternoon from the Jiuquan Satellite Launch Center.

After flying approximately six-and-a-half hours, their spaceship docked with the front port on the Tianhe core module — Tiangong station's core component — at 11:49 pm, and they began preparatory work to enter the space station, which included changing into intravehicular work suits from their pressure suits and configuring their spaceship.

Meanwhile, their Shenzhou XIX comrades — mission commander Senior Colonel Cai Xuzhe, Lieutenant Colonel Song Lingdong and Lieutenant Colonel Wang Haoze — waited inside the connection cabin. After all preparations were done, Cai's team opened a hatch in the connection cabin at 1:17 am to welcome the new team of astronauts.

After embracing the Shenzhou XX comrades, Cai said that he wished to congratulate Chen Dong for his return to the Tiangong, which means Heavenly Palace in English, and also congratulated Chen Zhongrui and Wang Jie for realizing their "spaceflight dreams". "In the following days, let us work together to make our 'space home' better," he said.

In response, Chen Dong said, "It feels great to return to the 'space home'. Let's make the best use of the next few days to finish the handover work."

The six crew members then took group photos to record the moment which marks the sixth in-orbit rendezvous of Chinese astronauts.

Both teams are scheduled to work together for about five days to ensure a smooth handover, after which the Shenzhou XIX crew will return to Earth, with their reentry capsule scheduled for touchdown on Tuesday, said the China Manned Space Agency.

As members of China's 15th manned spaceflight and the ninth group of residents aboard the Tiangong, the Shenzhou XX astronauts will carry out a variety of tasks over the next six months.

China unveils new cargo spacecraft

By **LIN SHUJUAN** in Shanghai
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A life-size model of the Qingzhou cargo spacecraft at an aerospace science exhibition in Shanghai on Wednesday. ZHANG JIANSONG / XINHUA

Qingzhou, China's next-generation cargo spacecraft designed for future in-orbit supply deliveries, including missions to China's Tiangong space station, took center stage in Shanghai this week as it made its public debut.

The unveiling of a life-size model of the spacecraft at an ongoing aerospace science exhibition at Shanghai World Expo Exhibition & Convention Center, served as part of the celebrations of this year's Space Day of China, which fell on Thursday.

Developed by the Innovation Academy for Microsatellites of the Chinese Academy of Sciences, Qingzhou is poised to embark on its maiden flight later this year, with the development team currently focused on finalizing the spacecraft's design and software for the initial test phase. Production is already underway for the subsystems and components of the test spacecraft, as confirmed by Chang Liang, the spacecraft's chief designer.

Literally meaning "Light Ship" in Chinese, Qingzhou features an integrated single-capsule configuration with a cargo volume of 27 cubic meters and a capacity up to 2 metric tons. It is designed to transport scientific research and experimental equipment, various scientific payloads and living supplies for Chinese astronauts.

It features a four-tier shelving system with 40 compartments and interfaces for special cargo needs, ensuring it can meet various demands during missions.

Notably, it can transport up to 300 liters of cold-chain products, ensuring that astronauts have access to fresh produce during their space missions.

"Qingzhou is a swift and nimble spacecraft, following a design which is astronaut-centered, of low-cost, high-reliability, high-flexibility and high-intelligence," said Shu Rong, the commander of the Qingzhou project.

The cargo spacecraft incorporates intelligent payload schemes and designs to optimize cargo delivery, retrieval and handling processes for astronauts, he said.

In addition to servicing the Tiangong space station, Qingzhou aims to offer commercial cargo services in the future, with a focus on generating economic and social benefits, Shu added.

Chang emphasized that Qingzhou embraces commercial spaceflight concepts and technical approaches, highlighting the spacecraft's cost-effectiveness achieved through technological innovations and streamlined launch procedures.

At the design stage, Chang said, the development team studied cargo spacecraft, both domestically and internationally, including the US' SpaceX Dragon spacecraft, Europe's Automated Transfer Vehicle named Jules Verne, Japan's H-II Transfer Vehicle (HTV) known as Kounotori and China's Tianzhou series. Ultimately, based on the spatial requirements issued by the China Manned Space Agency, they independently designed and developed the compact, integrated Qingzhou cargo spacecraft.

"We've opted for an integrated single-capsule design for greater flexibility in launch vehicle selection, making it compatible with multiple rocket types and supporting rapid launch needs," Chang said.

For its maiden flight, Qingzhou will launch aboard Lijian-2, a reusable rocket developed by CAS Space, a commercial spaceflight company under the Chinese Academy of Sciences.

China's commercial aerospace sector saw rapid development in 2024, with the Qingzhou cargo spacecraft being selected as one of two winners in the China Manned Space Agency's solicitation for a low-cost cargo transportation system. The Haoloong space cargo shuttle, a reusable cargo spaceplane designed by Chengdu Aircraft Design and Research Institute in Sichuan province, was the other winner.

"Qingzhou represents a milestone in the commercial development of China's manned space program," Chang said. "The flexibility of commercial aerospace, its cost control, and its pursuit of innovation are inherent advantages that will effectively strengthen China's overall space capabilities."