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Astronauts transferring cargo into space station

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The Shenzhou XIV crew on board the Tiangong space station entered the Tianzhou 5 cargo spaceship on Sunday afternoon and has begun to arrange and move supplies and equipment to the station, according to the China Manned Space Agency.

The agency said in a news release that the astronauts — mission commander Senior Colonel Chen Dong, Senior Colonel Liu Yang and Senior Colonel Cai Xuzhe — opened the Tianzhou 5 docking hatch and floated into the robotic craft. They will carry out tasks like transferring cargo to the station, it added.

Mission planners said the cargo ship is carrying about 5.3 metric tons of materials including living and mission necessities, scientific equipment and a mini experimental satellite. The craft also contains nearly 1.4 tons of propellant for the Tiangong station.

Tianzhou 5 was placed into a low-Earth orbit by a Long March 7 carrier rocket that blasted off on Saturday morning from the Wenchang Space Launch Center in Hainan province.

After the cargo craft entered the orbit, it traveled two hours and seven minutes to rendezvous with the massive Tiangong space station and docked with it at 12:10 pm.

These were the fastest rendezvous and docking maneuvers ever conducted by spacecraft, replacing the record created by Russian spacecraft Soyuz MS-17 on Oct 14, 2020, which took three hours and three minutes after liftoff to rendezvous and connect with the International Space Station.

The fast rendezvous and docking are key to establishing the ability to transport supplies to the space

station in an emergency, the manned space agency said.

Bai Mingsheng, chief designer of the Tianzhou family at the China Academy of Space Technology in Beijing, said that to achieve the fast rendezvous and docking, engineers optimized the guidance procedures and orbital maneuvers to shorten the time it took Tianzhou 5 to approach and link with the station.

"The fast-docking ability represents our advances in spacecraft's orbital and position control, guidance, and flight control technologies. It allows us to send fresh supplies and equipment to astronauts and improves our ability to carry out an emergency rescue," he said.

Tianzhou 5 is the fourth cargo ship to have docked with Tiangong, following Tianzhou 2, 3 and 4.

Tianzhou 4, which connected with the space station for six months, undocked from it on Wednesday and will be guided by ground controllers back to Earth in due course, the agency said last week.

According to Bai, starting with Tianzhou 6, new cargo ships will have an improved airtight cabin that can carry more supplies to astronauts.

The Tiangong station currently consists of a core module, two lab modules, a spacecraft used to transport the astronauts as well as the newly arrived cargo ship.

Three crews have lived and worked inside Tiangong, one of the world's largest space-based infrastructures. The Shenzhou XIV crew entered the outpost in June.

The Shenzhou XV crew is scheduled to launch and replace them in the coming weeks.

Saturday's launch marked the 440th flight of the Long March rocket family and the country's 50th space mission this year. More than 60 rocket launches are scheduled for this year.

Opinion Line

Express delivery even to astronauts in space station

On Saturday, a Long March-7 Y6 rocket carried the automated cargo spacecraft Tianzhou-5 into its planned orbit, and the spacecraft then successfully rendezvoused and docked with the Chinese space station.

The meaning of the move can never be overestimated. It is the first time that Chinese astronauts have received an automated cargo spacecraft in the space station complex, which means they are able to get supplies 400 kilometers above the ground. The service time of Chinese astronauts has already been prolonged from three months in 2021 to longer than five months in 2022. The cargo spaceship will make it possible for Chinese astronauts to stay even longer in space.

The rocket carrying Tianzhou-5 took off at 10:05 am, was announced a success at 10:21, and finished dock-

ing with the space station complex at 12:17. In other words, it took less than two hours for Tianzhou-5 to finish the docking job, which sets a new record for space missions.

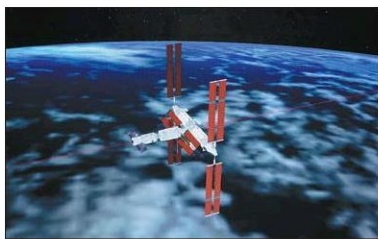
The fact that a cargo spaceship could arrive within such a short time has also enhanced the Chinese space station's capability of getting supplies in case of an emergency. Astronauts can not only enjoy fresh fruit and vegetables in space, but also be sent back to the Earth for treatment should they suffer a medical emergency.

Besides the Tianzhou-5, the carrier Long March-7 Y6, which belongs to the Long March-7 series, also marks a progress in China's space technology. It was in 2017 that Long March-7 first carried Tianzhou-1 into space. Now five years have passed and the number of Tianzhou has already been updated to 5, during which period the technology

of the Long March-7 rockets has constantly progressed.

According to China Aerospace Science and Technology Corporation, in the Long March-7 Y6 alone there are six technology improvements that boost the rocket's reliability. 2022 is of great importance to China's astronautics, as there are six key missions this year, including the docking of the Mengtian and Wentian lab modules with the core module of the space station, two Tianzhou cargo spaceships and two Shenzhou manned spaceships. By far, five of the missions have already been successfully conducted, which marks a good start for China's space station. With the complex entering normal operations, there will be more flights in the future, promising a good future for China's astronautics industry.

—ZHANG ZHIQIANG, CHINA DAILY



The Tianzhou 5 cargo spacecraft is docked with the orbiting Tiangong space station in this photo of a drawing taken on Saturday at Beijing Aerospace Control Center. SUN FENGXIAO / XINHUA