

China Has Lift-off for Its New Space Station

Launch of Tianhe module marks the start of an ambitious program to put Chinese taikonauts into permanent orbit by 2022

By <u>Frank Chen</u> Asia-Pacific Research, April 29, 2021 <u>Asia Times</u> Region: <u>China</u> Theme: <u>Science</u>

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The core module of China's future Tiangong space station blasted off Thursday morning from southern Hainan island's Wenchang Space Launch Center, marking a key next step in establishing a permanent human presence in space.

China's space station is poised to be the only habitable artificial satellite when the International Space Station (ISS) is decommissioned by 2024.

The Tiangong's core module, named Tianhe, or Heavenly Harmony, will contain living space for three taikonauts and auxiliary experiment units into a 16.6-meter, 22.5-tonne cylinder, according to state news agency Xinhua and independent media reports.

The Tiangong space station is expected to become fully operational by the end of 2022, with 11 more missions planned to complete its construction. Those include two more Long March 5B launches in the span of about 18 months to take up more parts and assemble them in orbit.

An unmanned cargo and refueling spacecraft will visit and dock by mid-year with the Tianhe in low orbit. Then the first crew to the new facility will embark on their journey. All told, the project will include three module launches, four crewed missions and four Tianzhou cargo spacecraft flights.

Once up and running, the T-shaped Tiangong is expected to remain in low orbit at between 400 and 450 kilometers above sea level for 15 years or possibly longer.

The size of the future space station, with total indoor space of 110 cubic meters to house three taikonauts, is dwarfed by the decade-old ISS, a multinational project spearheaded by Russia, the United States and the European Union that has 916 cubic meters of indoor rooms and labs. China was barred from participating in the ISS by the US.

Live feed from state broadcaster China Central Television showed space program employees cheering today (April 29) as the rocket powered its way through the atmosphere with a glowing fiery tail streak across the sky.



A visitor takes a picture of a mock-up of the Tianhe module on display. Photo: People's Daily



A different view of a mock-up of the Tianhe module on display. Photo: Xinhua

Beijing has pledged to open the Tiangong to foreign collaboration, without giving details of the scope of that scheme. The state-run Global Times has suggested Beijing should invite NASA to send American astronauts to the Tiangong as space programs and collaboration should be insulated from wider geopolitical tensions between the two giants. However, NASA is bound by US laws forbidding any such partnership with China's state sector, known as the China Exclusion Policy introduced by the Barack Obama administration.

Well before its inception, the Chinese space station was featured in the 2013 Hollywood scifi blockbuster Gravity, in which a woman US astronaut entered the Tiangong after a devastating explosion that destroyed her space ship and she eventually steered the Shenzhou space shuttle back to earth.

China launched the Tiangong-1 lab, its first prototype module intended to lay the groundwork for the permanent station, in September 2011. Xinhua says the experimental lab is still functioning normally, years beyond its designed life.

Meanwhile, Chinese taikonauts are undergoing intense training for the first of four crewed missions planned using the Shenzhou space ship to construct and operate the Tiangong.

China News Service reported that the training included underwater sessions in specially designed space suits in a full-size mockup of the space station.

News footage shows woman taikonaut Wang Yaping preparing for neutral buoyancy training as practice for extravehicular activities, also known as spacewalks, which will be a crucial part of the space station's construction and maintenance. The video also shows high-G centrifuge training.

As an up-and-coming new space superpower that has turned the space duopoly of America and Russia into a three-horse race, China put its first taikonaut, People's Liberation Army admiral Yang Liwei, in space in 2003.

A total of 11 have gone into space during the country's six crewed missions to date. China has over the years sent multiple probes to the Moon, including its dark side, and retrieved a small batch of lunar rocks and dust at the end of last year.

Another Chinese probe, the Tianwen, is circling Mars and preparing for a landing on the red planet next month.



Chinese President Xi Jinping inspects the lunar bounty. Picture: Xinhua

China celebrated its National Space Day last weekend, with the lunar samples exhibited across the nation and drawing huge crowds. Officials and engineers also revealed more dates, details and deadlines for four pillar programs focused on the space station, lunar exploration, Mars exploration and deep space trips.

Preparations are also being revved up for the Chang'e 6 to land on the South Pole of the Moon's dark side and return with samples, with its launch date set for 2024 or earlier.

Beijing and Moscow announced on April 24 a joint program to pool talent to design, construct and operate a lunar station for research and experiments.

Wu Weiren, the chief designer of the Chang'e lunar missions, told reporters the facility would comprise a station on the lunar surface as well as several orbiters and that a 2030 deadline had been set for both countries to break ground on the project that would be the first for mankind.

In the first hint of China's ambitions for a deep space odyssey, Xinhua cited Wu as saying that by 2049, the centenary of Communist China, a Chinese space ship would be flying to the edge of the solar system, about 15 billion kilometers from earth, to explore the unchartered territory of interstellar space, following in the steps of America's Voyager that left earth in 1977.

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Featured image: The Tianhe core module lifts off on Thursday morning, marking the start of the construction of China's first space station. Photo: Xinhua

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