

## Ready to roll

Mars rover reaches Red Planet, begins scientific exploration

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## China's Mars rover begins exploring Red Planet

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China's Martian rover Zhurong has started its scientific exploration after moving from the landing platform onto the Red Planet's surface on Saturday morning, according to the China National Space Administration.

The administration said in a statement on Saturday afternoon that, according to data sent back to ground control, the rover reached the surface at 10:40 am. It noted the maneuver was carried out safely and smoothly, adding that the rover has formally begun scientific tasks.

The administration also published a short black-and-white video clip taken by cameras on Zhurong showing the process of it leaving the landing platform and setting its wheels on soil.

According to sources with knowledge of the operation, the maneuver began after the rover received control signals sent from the Beijing Aerospace Control Center and took more than seven minutes to complete.

The 240-kilogram robot is tasked with surveying Mars' landforms, geological structures, soil characteristics, potential locations of water and ice, and atmospheric and environmental traits, as well as magnetic, gravitational and other

physical fields, the statement said. Saturday's deployment marked the beginning of a challenging new chapter in the Tianwen 1 mission, one of the most sophisticated space adventures ever attempted.

Before Tianwen 1, no country had tried to send an orbiter, a lander and a rover in a single expedition to Mars.

Tianwen 1's landing capsule touched down on Mars on the morning of May 15, becoming the first Chinese spacecraft to land on another planet.

President Xi Jinping called the probe's arrival on Mars a landmark achievement in China's space program, as it left the nation's first mark on the Red Planet.

During the past week on the landing capsule, Zhurong, named after an ancient Chinese god of fire, performed preparations for Saturday's maneuver, such as detecting terrain conditions around its landing site and sending data back to Earth for analysis and decision-making.

The robot is now about 320 million kilometers from Earth. It is the sixth rover on Mars, following five others launched by the United States.

The 1.85-meter-tall robot is propelled by six wheels and powered by four solar panels, and can move at 200 meters an hour on the Martian surface.

Developed by the China Academy of Space Technology in Beijing, the major maker of Chinese spacecraft, Zhurong carries six scientific instruments including a multi-spectral camera, shallow subsurface radar and meteorological measurer.

If the semi-autonomous vehicle functions efficiently, it will work for at least three months and undertake comprehensive surveys of the planet.

Sun Zezhou, chief designer of the Tianwen 1 probe, said previously that the rover will have to overcome an array of difficulties on Mars, such as disturbances in sunlight reception and extreme weather, in order to survive and operate.

### Special system

He said Zhurong has been programmed to inactivate itself under extreme circumstances and reactivate when safe to do so.

Chen Baichao, a structural designer of Zhurong, said the robot is equipped with an active suspension system to ensure that the rover can easily travel on rugged terrain. The system also allows the rover to keep moving even if one of its wheels malfunctions, he added.

Tianwen 1, named after an ancient Chinese poem, was launched by a Long March 5 heavy-lift carrier rocket on July 23 from the Wenchang Space Launch Cen-

ter in the southernmost island province of Hainan, kick-starting China's first mission to another planet.

Driven by a mixture of 48 large and small engines, the spacecraft rocketed more than 470 million km and carried out four mid-course corrections and a deep-space trajectory maneuver before entering the orbit of Mars on Feb 10.

On Feb 24, Tianwen 1 entered a preset parking orbit above Mars. The spacecraft was programmed to maintain that orbit for about three months to examine the pre-determined landing site.

Tianwen 1's orbiter is circling the planet for mapping and measurement tasks with seven scientific instruments, including a high-resolution imager and magnetometer. It is also responsible for relaying signals between ground control and the Zhurong rover.

Tianwen 1 is the 46th Mars exploration mission since October 1960. It follows the US' Mars 2020 mission, which has already deployed a rover, Perseverance, and the first Mars-based rotorcraft, Ingenuity.



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