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Chang'e 6 to land on moon in 1st half of year

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The Chang'e 6 spacecraft, China's next robotic expedition to the moon, is scheduled to land on the lunar surface in the first half of this year and will be tasked with bringing back samples from its little-known far side, according to the China National Space Administration.

The administration said in a news release on Wednesday that components of the Chang'e 6 probe were transported by two military cargo planes to Haikou, capital of Hainan province, on Monday and Tuesday, and were then carried by truck to the Wenchang Space Launch Center on the east coast of the island province.

The probe will be assembled and undergo prelaunch checks at the center, it noted, adding that preparatory work is underway on all systems involved in the coming mission.

Like Chang'e 5, its predecessor, the Chang'e 6 spacecraft is a product of the China Academy of Space Technology in Beijing and also consists of four components — an orbiter, a lander, an ascender and a reentry module.

Its operational process will mimic that of the Chang'e 5. After the probe reaches lunar orbit, the components will separate into two parts, with the orbiter and reentry module remaining in orbit while the lander and ascender head for the moon's surface.

The lander-ascender combination will make a soft landing and then start using a drill and a mechanical arm to gather lunar rocks and soil.

Once the surface operations are completed, the ascender's rocket will elevate it to lunar orbit to dock with the reentry module. It will transfer samples to the module, which will carry them to Earth.

The United States, the former Soviet Union and China have brought lunar samples back to Earth, but none has ever obtained soil from the far side of the moon.

Tidal forces on Earth slow the

moon's rotation to the point where the same side always faces Earth. The other side, most of which is never visible from Earth, is the moon's far side and has been a subject of popular culture since the Apollo era.

Though the far side had been photographed by spacecraft, no probe had ever touched down on it until China's Chang'e 4 mission, which landed in the South Pole-Aitken Basin in January 2019.

Pang Zhihao, an expert on space exploration technology who worked at the China Academy of Space Technology for decades, said that the Chang'e 6 mission is set to touch down in the South Pole-Aitken Basin and collect dust and rock samples there.

"Landing a spacecraft on the lunar surface is never easy, but it's always worth a shot. We have all the necessary expertise thanks to the success of the Chang'e 5 mission, but sending a probe to the far side and bringing samples back is still challenging. After all, no one has ever attempted it," he said.

If the mission succeeds, it will tremendously advance the research of the moon, according to Pang.

"The South Pole-Aitken Basin, a gigantic crater at the bottom of the moon, is the largest and deepest known basin in the solar system. It has a mineralogy distinct from other locations that may reflect materials from the inside of the moon that were brought up by the impact that created the basin. The far side is also considerably more mountainous than the near side for reasons researchers have yet to find out," he explained.

To boost international cooperation on lunar research, the CNSA has offered to carry a total of 10 kilograms of foreign equipment on the mission's lander and orbiter.

After rounds of selection and talks, the CNSA decided that the Chang'e 6's lander will carry scientific instruments from France, Italy and the European Space Agency, and a Pakistani payload will be mounted on the orbiter.