

## FEATURE

# China's *Chang'e 4* probe

## So far so good for Chinese lunar probe

The probe's scheduled landing on the dark side of the moon on January 3 will be a landmark in Chinese space exploration

By Asia Times staff

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<http://www.atimes.com/article/so-far-so-good-for-chinese-lunar-probe/>



*The rover of the Chang'e 4, the first lunar probe that will land on moon's far side. Photo: Xinhua*

China's *Chang'e 4* probe has now entered lunar orbit, making steady headway towards the first-ever soft landing on the far side of the moon by a man-made spacecraft.

The saucer-shaped probe comprising a lander and a rover is named after the lunar goddess of ancient Chinese folklore. It has now

swung through the earth-moon Lagrangian point on its 384,400-kilometer trek, after being catapulted into space atop a Long March-3 heavy duty rocket last Saturday.



*Launch of the Chang'e 4 on December 8 from China's Xichang satellite launch center in western Sichuan province. Photo: Xinhua*

China's National Space Administration said ground control had ignited a reverse-thrust engine at 4:45 pm on Wednesday, when the probe was some 130 km above the moon's surface. This was for it to decelerate and enter an elliptical lunar orbit.

The *Chang'e 4* has been following its designed route with almost unerring precision and two further planned tweaks to its trajectory before the near-moon deceleration turned out to be unnecessary, according to Xinhua.

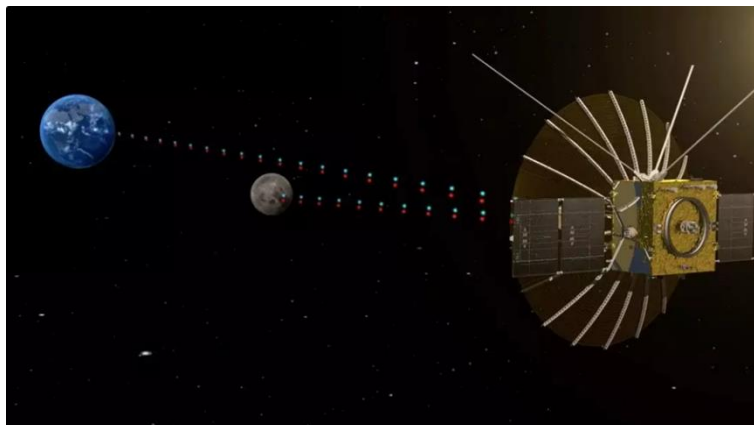
Now all eyes await the *Chang'e 4*'s first sighting by the *Queqiao* (Mandarin for "magpie

bridge"), a satellite in position with clear views of both the moon's far side and earth. The satellite



*Since the moon's revolution cycle is the same as its rotation cycle, the same side always faces the earth. The other side, most of which cannot be seen from earth, is called the far side or dark side, not because it is dark, but because most of it remains unknown. Photo:*

*Handout*



A rendering of the Queqiao satellite performing its communications relay beyond the moon. Photo: Chinese Academy of Sciences

will relay communications between Beijing and the probe's location on the dark side of the moon.

After that, engineers at the Beijing control center can sit back and hope to witness the uneventful landing of the probe, likely on 3 January 2019, in the moon's South Pole–Aitken crater basin.

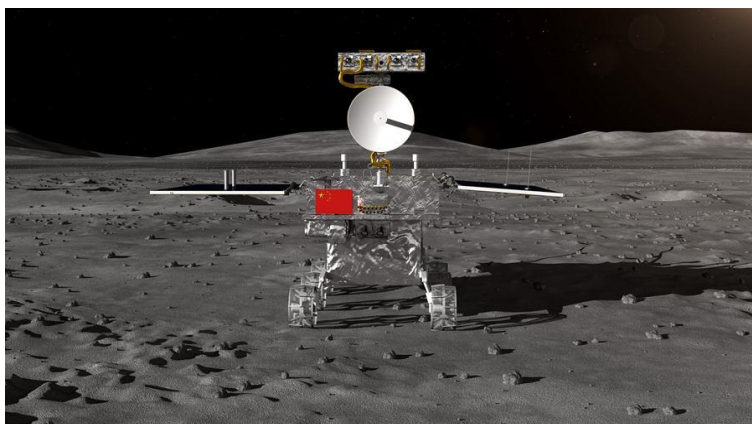
Much of the *Chang'e 4* lander and rover design is modeled after the *Chang'e 3* and its *Yutu* (jade rabbit) rover. The total landing mass is said to be 1,200kg including a vital radioisotope heater unit to heat its subsystems during the long lunar nights and to power all operations. The solar-powered, six-wheel rover measures  $1.5 \times 1.0 \times 1.0$ m and has a mass of 140kg.

The *Chang'e 4*'s planned one-year mission will include low-frequency radio astronomical observations to study cosmic rays and solar corona, terrain and geological surveys as well as measuring the neutron radiation and neutral atoms to learn more about the environment on the moon's far side, according to CNSA.

The probe carries detectors and other scientific payloads developed by partners from the Netherlands, Germany, Sweden and Saudi Arabia.

China's Lunar Exploration [program](#) is being carried out in three phases of incremental technological advancement; the program's first lunar landing was accomplished by the *Chang'e 3* in December 2013.

Beijing's ultimate ambition is to [send](#) Chinese astronauts, or taikonauts there in the 2030s, and possibly to build an outpost near the moon's south pole.



The *Chang'e 4* will be the first spacecraft ever to land on and explore the moon's far side. Photo: Xinhua

## Chang'e-4 Successfully Enters Lunar Orbit

Luyuan Xu

December 12, 2018

<http://www.planetary.org/blogs/guest-blogs/2018/change-4-lunar-orbit.html>

Next stop: the Lunar Farside

China's *Chang'e-4* lunar mission, the first-ever soft-landing endeavor on the lunar farside, launched successfully on 8 December at 02:23 Beijing time (7 December at 18:23 UTC) via a Long March 3B rocket from Xichang Satellite Launch Center.

The launch carried a lander and a rover toward the Moon.

On 12 December at 8:45 Beijing time (16:45 UTC), the spacecraft arrived in lunar orbit, preparing for a landing in early January.