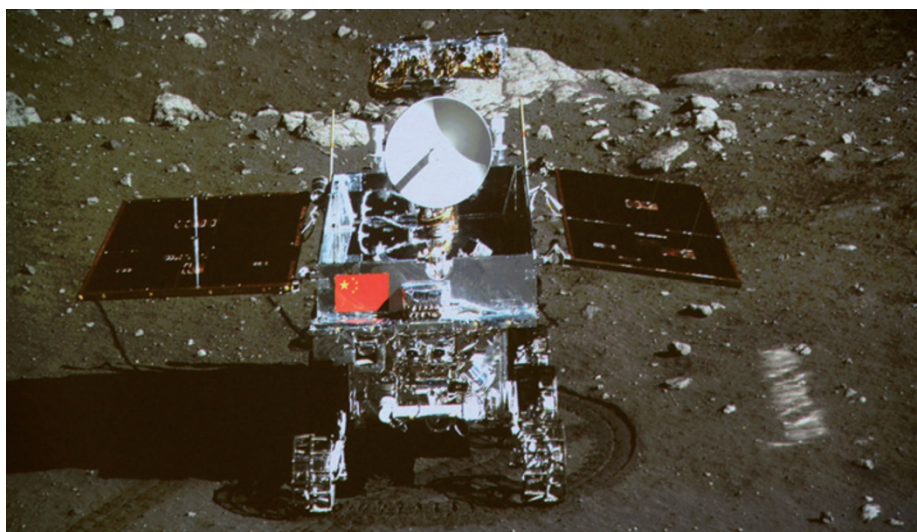


China lands on the Moon

After a hiatus of 37 years, the lunar surface has a new visitor. China's Chang'e 3 lander set down on the dark plains of a lunar nearside basin on 14 December 2013. The China National Space Administration succeeded in its first attempt to land a spacecraft on another world — something no other space agency can claim — and it doubled down on the win by deploying a capable six-wheeled rover, named Yutu ('Jade Rabbit'), to explore the terrain around the lander.

The journey taken by Chang'e 3 to the Moon was dramatic and brief. On 1 December, a Long March 3B rocket practically leapt off the launch pad in the southwestern province of Sichuan to send the spacecraft directly towards the Moon, with no loops in Earth orbit. Both the second and third stages of the rocket were equipped with cameras that transmitted live video to Earth of the rocket staging and final separation of the spacecraft.

The cameras were not just for sightseeing. Chang'e 3 employed a video camera on the bottom of the lander to autonomously select a smooth spot for touchdown. The spacecraft neatly avoided hazards of boulders and a nearby crater. It dropped the final three metres in free fall to plant firmly on to a surprisingly dust-free surface.



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Since landing, both lander and rover have successfully operated their combined eight science instruments, and the rover has travelled in a semicircle around the lander, with the two spacecraft snapping photos of each other. In two-week periods of activity, followed by two-week periods of hibernation during the lunar nights, the lander will perform experiments including ultraviolet astronomy and observations of Earth's upper atmosphere, and the rover will embark on

the first lunar traverse armed with a ground-penetrating radar. The nominal mission is to last three lunar days, but mission engineers have remarked that the spacecrafts' good health could yield an extended lifetime on the Moon. □

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The journalist's take

Following Asian space missions presents a significant challenge to English-speaking media because of the language barrier and different levels of public engagement on the Internet. The European and American space agencies ESA and NASA make work easy for English-speaking journalists and bloggers, providing lots of easy-to-digest information on stable websites in English. Japan's space agency JAXA provides online information of similar quality to NASA and ESA — but in Japanese, of course.

While covering Japan's Hayabusa asteroid sample return mission from 2003 to 2010, I learned how to use online translation tools to find and translate official content, often breaking Hayabusa news to English-speaking media. Machine translation of Japanese is not very good, but with experience I learned to recognise patterns in bad translations and became adept at making sense of apparent nonsense.

Unlike Japan, China's space agency does not have regularly updated websites with information about space missions. And, during previous missions, China has not been forthcoming with information until after the event. But I have seen a huge change in the openness of the China National Space Administration with Chang'e 3. For the launch and landing, they conducted television events carrying live video from the spacecraft that featured expert commentators, both in Chinese and in English. We in the West saw the launch and the separation of the spacecraft at the same time that the mission controllers in the East did.

Since the launch, the skills and tools I developed following Hayabusa have come in handy for keeping track of Chang'e 3. With the help of machine translators as well as bilingual space enthusiasts who volunteer their skills in online forums and on Twitter, I've been able to report on every step of Chang'e 3 and Yutu's progress on the Moon so far, from the first mutual imaging session

to the first spectrum returned from the rover's arm-mounted spectrometer.

At first, all images released by the Chinese space agency were shared through a curious method: the images were projected on a large screen in Beijing, and then the screen was recorded by a television camera, usually panning across the image. Then state television broadcasted the video over the air and online. The result of this Rube-Goldberg-like transmission method was to blur, distort and saturate the images to the point that they had little fidelity to the quality of the original science data.

After the first lunar day, however, the Chinese Academy of Sciences began to release higher-quality images. Spokespeople have said that China will eventually share all of the science data from Chang'e 3 publicly through its own websites and by direct transfer to ESA, as they did with the Chang'e 2 orbiter's lunar data.