

If there were people in North America so early, it's unclear what happened to them. "There continues to be no convincing genetic evidence of a pre-15,000-years-ago human presence in the Americas," says geneticist David Reich at Harvard Medical School in Boston, Massachusetts.

Ardelean says there is a simple reason why genetic studies suggest that humans spread across the Americas only relatively recently: early groups such as the one he thinks was present at Chiquihuite Cave didn't survive to contribute to modern gene pools. "I definitely advocate for the idea of lost groups," he says.

CHINA'S MARS LAUNCH SEALS NEW ERA IN DEEP-SPACE EXPLORATION

The Tianwen-1 mission represents the country's first attempt to land on the red planet.



Tianwen-1 is scheduled to arrive at Mars in February.

By Smriti Mallapaty

A Chinese spacecraft is on its way to Mars after launching successfully from Hainan Island in southern China. The mission – named Tianwen-1, which means ‘questions to heaven’ – is the country's first attempt to land on the red planet.

The 5,000-kilogram spacecraft, which contains a lander, orbiter and rover, blasted off from the Wenchang Satellite Launch Center aboard a Chinese Long March-5 rocket at 12:41 p.m. local time on 23 July. Some 36 minutes later, the craft was put on its trajectory towards Mars.

"This is a really ambitious mission driven by science that represents significant progress in China's space programme, and they should be proud," says David Flannery, an astrobiologist

at Queensland University of Technology in Brisbane, Australia. A lot could still go wrong, he says, "but so far so good".

Chinese officials have been tight-lipped about many details of Tianwen-1, including the cost and launch preparations. "The Mars mission is very risky, so I understand why managers are keeping quite a low profile," says Ji Wu, former head of China's National Space Science Center in Beijing. Ji was chief scientist on China's attempt to send an orbiter to Mars aboard a Russian spacecraft in 2011, which failed. That mission "didn't even depart from Earth's orbit. That was a very sad story," he says.

Tianwen-1 is one of three daring missions to the red planet this year. The United Arab Emirates (UAE) launched its Hope orbiter last week, and the United States' craft – a six-wheeled rover named Perseverance – is likely to launch this week.

Together with the success of the UAE's orbiter, Tianwen-1 adds weight to a new reality, "that Solar System exploration is not the prerogative of the Euro-American world, but a global enterprise", says geologist Jon Clarke, who is president of the Mars Society Australia based in Canberra. China, India and Japan have previously sent probes into space, including missions to the Moon, Mars, Venus and some asteroids.

Tianwen-1 is now coasting through space before it reaches its destination in February. The craft will then spend several months positioning itself for the landing. In April, the orbiter will release the lander and rover into the Martian atmosphere, and these will touch down somewhere on Utopia Planitia – a vast plain littered with volcanic rocks, within a large basin. If the landing is successful, China will be only the second country, after the United States, to softly land a rover on Mars, says Flannery. The six-wheeled, solar-powered rover, which has a lifetime of around 90 Martian days – the equivalent of some 93 days on Earth – will explore areas of scientific interest.

The orbiter will loop around Mars for an entire Martian year – 687 Earth days.

China's mission aims to conduct a global survey of the planet, including studying its geological structures, surface characteristics and climate. The orbiter is packed with seven scientific instruments, and the rover has six more. These include several cameras, subsurface radar and a spectrometer.

A magnetic-field detector on the rover could gain valuable insights into Mars's past magnetic field, which would have shielded the planet from radiation, says Flannery. And its ground-penetrating radar will help discern some of the geological structures just below the surface of the planet, he says.

The mission "promises to be a milestone in Chinese and global exploration of the planet", says Clarke. "It will mean new and complementary data about Mars from orbit and from a new location on the Mars surface."

Mars has been a major focus of NASA's space exploration, says Katarina Miljkovic, a planetary scientist at Curtin University in Perth, Australia. "Adding new countries to the mix, like China and UAE, is very exciting," she says.

Smaller and newer space powers could also create opportunities for science, says Flannery, who helped build NASA's Perseverance rover. That rover will collect rocks that will one day be brought back to Earth. "Many of the greatest challenges for planetary science in the coming decades will require international cooperation," he says. Returning samples from Mars will be expensive and technically complex. China plans to bring samples back by 2030. In some sense, Tianwen-1 is testing the necessary technology for such a mission, says Flannery.