

NASA counts down to Orion's first step to Mars

December 4 2014, by Kerry Sheridan



NASA's Orion spacecraft, mounted atop a United Launch Alliance Delta IV Heavy rocket, is visible inside the Mobile Service Tower where the vehicle is undergoing launch preparations, in Cape Canaveral, Florida, on December 3, 2014

The Orion spacecraft, designed to carry humans farther in deep space than ever before, is poised to blast off Thursday in what NASA hailed as

a first step in mankind's journey to Mars.

UPDATE: [Wind gusts stall launch of new Orion spacecraft](#)

No astronauts will be on board the capsule when it launches aboard the United States' largest rocket, the Delta IV Heavy made by United Launch Alliance, but engineers will be keenly watching to see how it performs during the four-and-a-half hour flight.

The launch marks the first of a US spacecraft meant to carry people into deep space since the Apollo missions that brought men to the Moon in the 1960s and 1970s.

With no American vehicle to send humans to space since the space shuttle was retired in 2011, some at NASA said the Orion launch has re-energized the US space program, long constrained by government belt-tightening and forced to rely on costly rides aboard Russian Soyuz spacecraft to reach the International Space Station in low-Earth orbit.

"We haven't had this feeling in awhile, since the end of the shuttle program, (of) launching an American spacecraft from America's soil and beginning something new," said Mike Sarafin, lead flight director at NASA's Johnson Space Center in Houston.

Tourists and space enthusiasts lined the area known as Florida's Space Coast to see the powerful rocket blast off at sunrise, and 27,000 guests were at Kennedy Space Center for a close up look at the rocket, NASA spokesman Mike Curie said.

Potential future missions for Orion, which is designed to fit four people at a time, include a trip to lasso an asteroid and a journey to Mars by the 2030s.

"Thursday is the beginning of that journey, testing key systems—the riskiest systems I would say for Orion—before we have any people on board," said Mark Geyer, program manager for Orion.

Launch from Cape Canaveral



Charles F. Bolden, Jr., NASA Administrator, speaks to the media near the United Launch Alliance Delta 4 rocket, carrying NASA's first Orion deep space exploration craft, in Cape Canaveral, Florida, on December 3, 2014

The launch at 7:05 am (1205 GMT) from Cape Canaveral, Florida, aims to propel 1.63 million pounds (739,000 kilograms) of spacecraft, rocket and fuel straight to space, where the capsule will make two laps around the Earth before splashing down in the Pacific Ocean.

The first orbit will be about as high as the International Space Station, which circles at an altitude of about 270 miles (430 kilometers), but the second will soar 15 times higher, to an apogee of 3,600 miles (5,800 kilometers) above the Earth.

The chief contractor of the Orion capsule is Lockheed Martin. The spacecraft was first designed to take humans to the Moon as part of NASA's Constellation program, which was cancelled by President Barack Obama in 2010, in favor of seeking new destinations in deep space.

The goal is both nebulous and costly, and NASA has already spent 9.1 billion dollars on Orion and the powerful rocket meant to propel it with crew on board, the Space Launch System (SLS).

Another unmanned test flight is slated for 2018. The first Orion test flight with people on board is scheduled for 2021, but with costs projected to reach \$19-22 billion, space analyst Marco Caceres of the Teal Group in Virginia said it could be longer.

"Assuming Congress or one of the next two presidents do not cancel SLS because of its inevitably ballooning costs, it's more likely that the first SLS/Orion manned mission will occur closer to the middle part of the next decade," Caceres said.

Safety first



A United Launch Alliance Delta 4 rocket carrying NASA's first Orion deep space exploration craft sits on its launch pad in Cape Canaveral, Florida, on December 3, 2014

As NASA looks beyond the Moon, safety for human explorers is another key problem that has yet to be solved.

"Radiation is one of the biggest challenges for us," NASA administrator Charles Bolden told an audience of NASA enthusiasts gathered at Kennedy Space Center for a social media event.

The primary objective of Thursday's test, according to Geyer, is to see

how the heat shield performs as it reaches temperatures of 4,000 degrees Fahrenheit (2,200 Celsius) on its high-speed plunge back to Earth at a velocity of 20,000 miles (32,000 kilometers) per hour.

"A part of me hopes that everything is perfect. We land, have high-fives and everybody has a great time," Geyer told reporters.



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But he added that the test is designed to find things that go wrong before precious lives are at risk.

"We want to discover things that are beyond our modeling capability and beyond our expertise so we can learn it and fix it before we put people

on board."

Weather for Thursday's launch was expected to be 70 percent favorable, with some risk of winds and rain, but NASA said the two hour, 39-minute launch window gives the team plenty of flexibility to accomplish the launch during the daylight hours.

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