Perseverance rover is 100 days out

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An electrical cable can be seen snaking its way along insulation material in this in-flight image of the interior of the Mars 2020 spacecraft on its way to the Red Planet. The picture was assembled using three images taken by the Perseverance

rover's rear left Hazcam during a systems check on Oct. 19, 2020. Credit: NASA/JPL-Caltech

Mark your calendars: The agency's latest rover has only about 8,640,000 seconds to go before it touches down on the Red Planet, becoming history's next Mars car.

A mere 100 days and 166 million miles (268 million kilometers) separate NASA's Mars 2020 Perseverance rover mission and the Red Planet's Jezero Crater. Landing will occur on Feb. 18, 2021, at 12:43 p.m. PST (3:43 p.m. EST), with confirmation being received back at NASA's Jet Propulsion Laboratory in Southern California about 11 1/2 minutes later.

The six-wheeled Mars car is tasked with prowling the crater—believed to be the site of a Martian lake billions of years ago—to search for signs of ancient microbial life, collect and cache Martian rock and regolith (broken rock and dust), and pave the way for human exploration of the Red Planet.

"While we call the six-and-a-half-month trip from Earth to Mars 'cruise,' I assure you there is not much croquet going on at the lido deck," said Project Manager John McNamee of JPL. "Between checking out the spacecraft, and planning and simulating our landing and surface operations, the entire team is on the clock, working toward our exploration of Jezero Crater."

On Nov. 9, the mission team confirmed that the propulsion subsystem of the descent stage, which will help lower the rover onto Mars, is in good working order. Today, Nov. 10, they turn their attention to the rover's PIXL and SHERLOC instruments. The Lander Vision System is

scheduled to go under the microscope on Nov. 11; and the SuperCam instrument, the day after that. Down the road, on Dec. 18, the team plans to perform a trajectory correction maneuver, using the cruise stage's eight thrusters to refine the spacecraft's path toward Mars.

The mission has already held several test scenarios to help evaluate procedures and train Mars 2020 mission controllers for important milestones to come. During some of these multi-day-long tests, the team encounters unexpected challenges thrown their way by colleagues who play the role of "gremlins." Even with the challenges introduced during a landing rehearsal back on Oct. 29, the team was able to successfully land a simulated Perseverance rover on Mars.

Another important mission milestone will be rehearsed starting next Monday, Nov. 16, when the team begins a five-day simulation of surface operations—including driving the rover and conducting a sampling. In December, the team is expecting a gremlin or two to make an appearance during another five-day simulation of the rover's transition from landing to surface operations.

The parachute for the Mars 2020 Perseverance rover mission is tested in a wind tunnel at NASA's Ames Research Center in California's Silicon Valley. Credit: NASA/JPL-Caltech/Ames

More About the Mission

A key objective of Perseverance's mission on Mars is astrobiology, including the search for signs of ancient microbial life. The rover will characterize the planet's geology and past climate, pave the way for human exploration of the Red Planet, and be the first mission to collect and cache Martian rock and regolith (broken rock and dust).

Subsequent missions, currently under consideration by NASA in cooperation with ESA (European Space Agency), would send spacecraft to Mars to collect these cached samples from the surface and return them to Earth for in-depth analysis.

The Mars 2020 mission is part of a larger program that includes missions to the Moon as a way to prepare for human exploration of the Red Planet. Charged with returning astronauts to the Moon by 2024, NASA will establish a sustained human presence on and around the Moon by 2028 through NASA's Artemis lunar exploration plans.

Provided by NASA