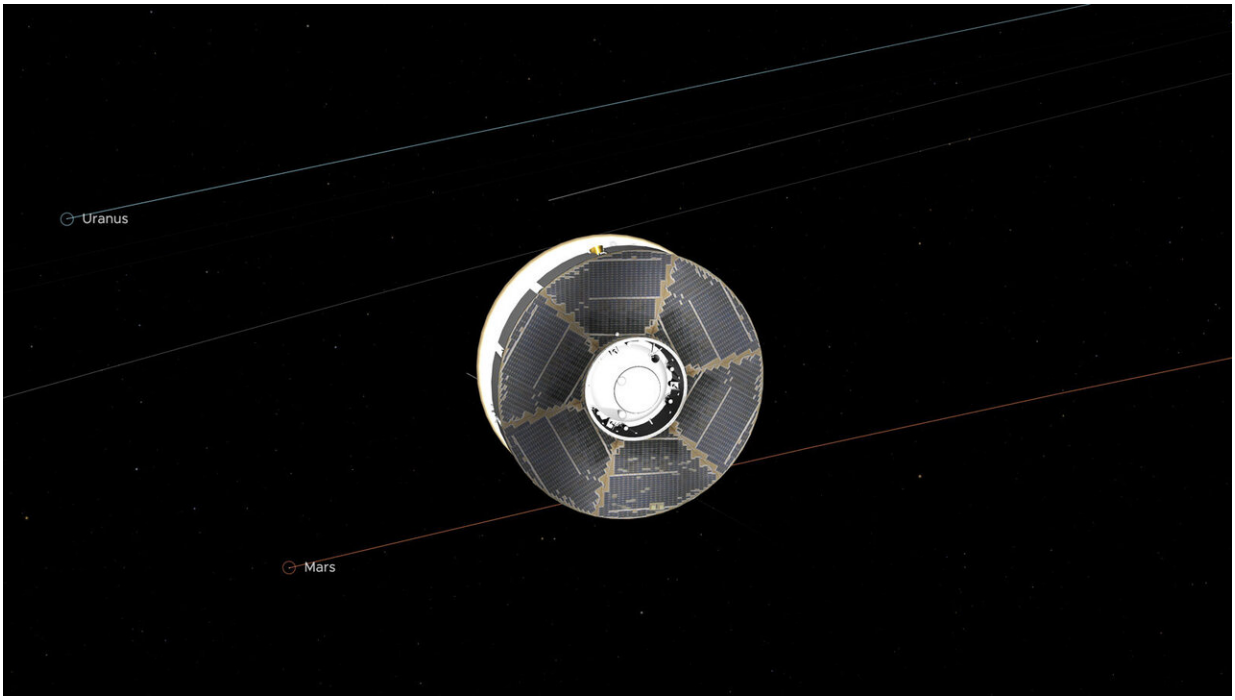
NASA's Perseverance rover is midway to Mars

October 27 2020



This illustration of the Mars 2020 spacecraft in interplanetary space was generated using imagery from NASA's Eyes on the Solar System. The image is from the mission's midway point between Earth and Mars. Credit: NASA/JPL-Caltech

NASA's Mars 2020 Perseverance rover mission has logged a lot of flight miles since being lofted skyward on July 30—146.3 million miles (235.4 million kilometers) to be exact. Turns out that is exactly the same

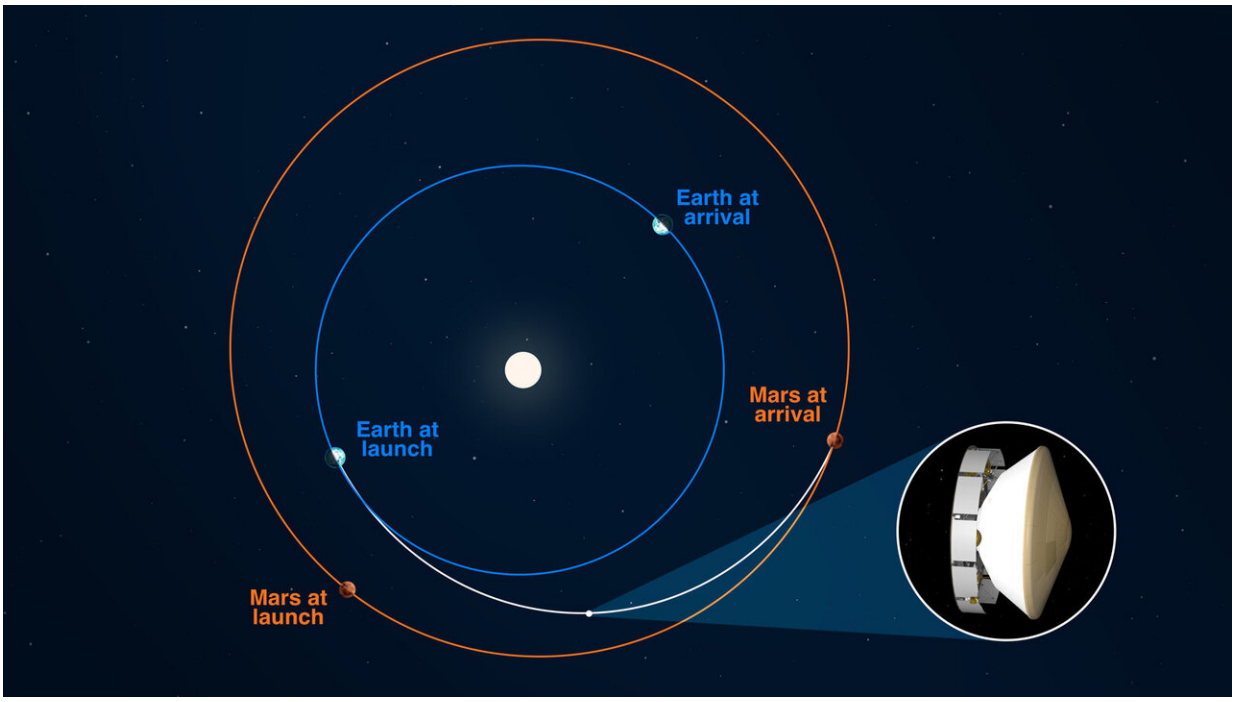
distance it has to go before the spacecraft hits the Red Planet's atmosphere like a 11,900 mph (19,000 kph) freight train on Feb. 18, 2021.

"At 1:40 p.m. Pacific Time today, our spacecraft will have just as many miles in its metaphorical rearview mirror as it will out its metaphorical windshield," said Julie Kangas, a navigator working on the Perseverance rover mission at NASA's Jet Propulsion Laboratory in Southern California. "While I don't think there will be cake, especially since most of us are working from home, it's still a pretty neat milestone. Next stop, Jezero Crater."

The Sun's gravitational influence plays a significant role in shaping not just spacecraft trajectories to Mars (as well as to everywhere else in the solar system), but also the relative movement of the two planets. So Perseverance's route to the Red Planet follows a curved trajectory rather than an arrow-straight path.

"Although we're halfway into the distance we need to travel to Mars, the rover is not halfway between the two worlds," Kangas explained. "In straight-line distance, Earth is 26.6 million miles [42.7 million kilometers] behind Perseverance and Mars is 17.9 million miles [28.8 million kilometers] in front."

At the current distance, it takes 2 minutes, 22 seconds for a transmission to travel from mission controllers at JPL via the Deep Space Network to the spacecraft. By time of landing, Perseverance will have covered 292.5 million miles (470.8 million kilometers), andMars will be about 130 million miles (209 million kilometers) away from Earth; at that point, a transmission will take about 11.5 minutes to reach the spacecraft.



NASA's Mars 2020 Perseverance rover reached its halfway point - 146.3 million miles (235.4 million kilometers) - on its journey to Jezero Crater on Oct. 27, 2020, at 1:40 p.m. PDT (4:40 EDT). Credit: NASA/JPL-Caltech

Work continues en route

The mission team continues to check out spacecraft systems big and small during interplanetary cruise. Perseverance's RIMFAX and MOXIE instruments were tested and determined to be in good shape on Oct. 15. MEDA got a thumbs up on Oct. 19. There was even a line item to check the condition of the X-ray tube in the PIXL instrument on Oct. 16, which also went as planned.

"If it is part of our spacecraft and electricity runs through it, we want to confirm it is still working properly following launch," said Keith Comeaux, deputy chief engineer for the Mars 2020 Perseverance rover

mission. "Between these checkouts—along with charging the rover's and Mars Helicopter's batteries, uploading files and sequences for surface operations, and planning for and executing trajectory correction maneuvers—our plate is full right up to landing."

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

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