

NASA/JPL-Caltech



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Watched by millions of people via live-streaming on television channels or online platforms, NASA's Perseverance rover landed on Mars on 18 February 2021, touching down on schedule in the Jezero Crater. Launched aboard a rocket that lifted off from Cape Canaveral Air Force Station in Florida, USA, on 30 July 2020, its mission is to search for signs of fossilised microbial life. Jezero is a 45 km-wide impact crater that is believed to have once been flooded with water, as it formed part of an ancient river delta.

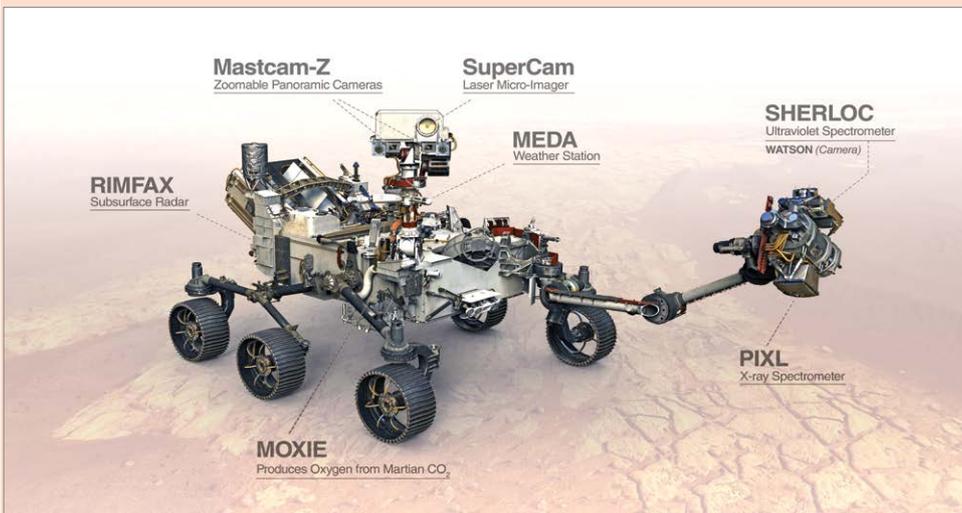
Perseverance is the fifth rover that NASA has sent to Mars, and the largest to date, weighing in at 1 025 kg. It is also the first to carry a drill large enough to collect core samples of Martian rock and soil. These will be stored in sealed tubes for retrieval by a future mission, which would ferry them back to Earth for detailed analysis.

Perseverance also has a number of other instruments that collect geological data for immediate transmission to scientists on Earth. For example, SHERLOC – an acronym for Scanning Habitable Environments with Raman & Luminescence for Organics and Chemicals – is a Raman spectrometer that uses an ultraviolet (UV) laser

to determine fine-scale mineralogy and detect organic compounds. By contrast, PIXL – the Planetary Instrument for X-ray Lithochemistry – is an X-ray fluorescence spectrometer that will permit more detailed analysis of chemical elements in surface materials than ever before. The Radar Imager for Mars' Subsurface Experiment (RIMFAX) is a ground-penetrating radar that will provide centimetre-scale resolution of the geologic structure of the subsurface.

Perseverance has a similar design to the Curiosity rover, which landed in the 154 km-wide Gale Crater in August 2012 and has since travelled more than 24 km. Curiosity's drill can only pulverise rock for analysis by its onboard instruments. Some 3 700 km separate the Gale and Jezero craters, so the two rovers will not be meeting up!

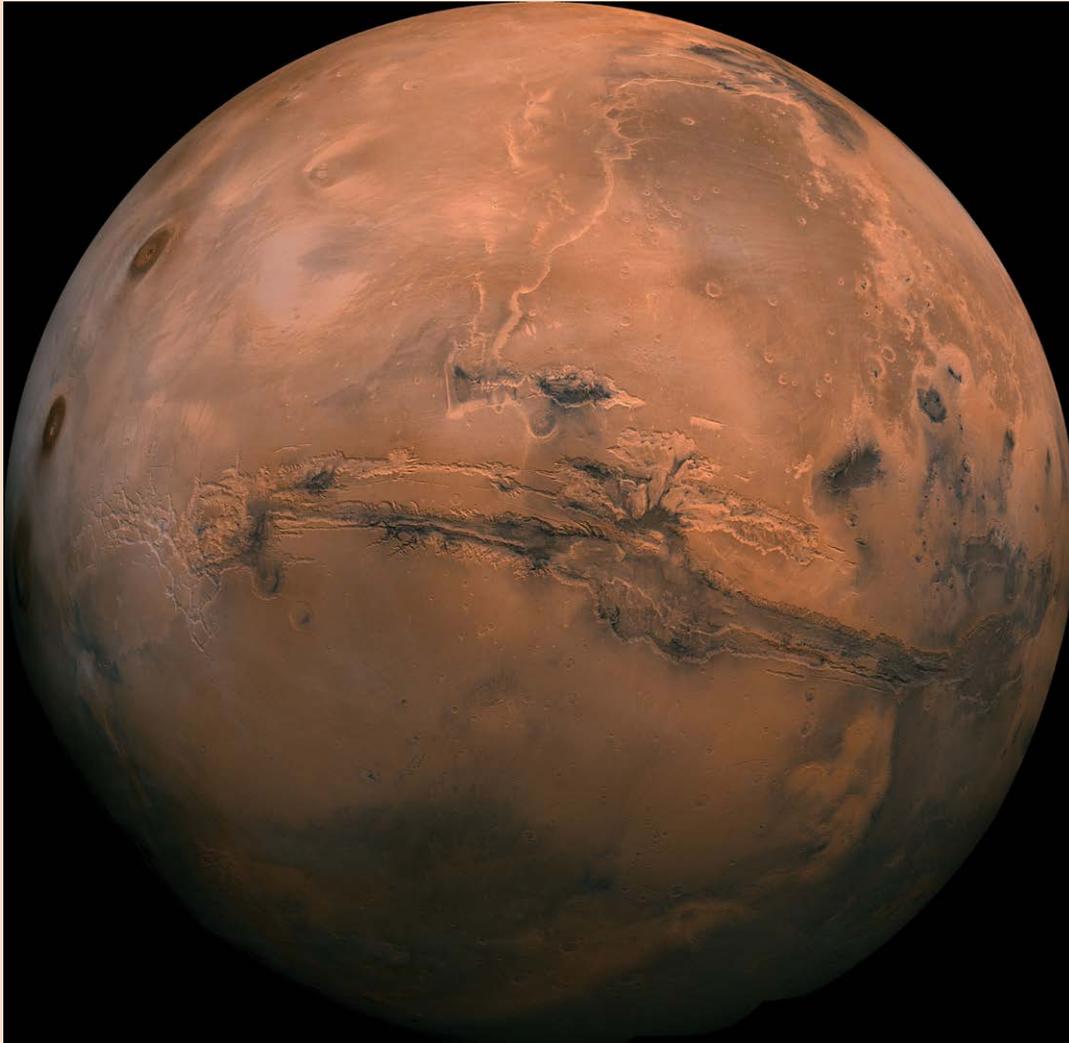
In January 2004, the twin Spirit and Opportunity rovers, which weighed just under 170 kg each, arrived on opposite sides of Mars. Their planned mission was only 90 days, but Spirit lasted until March 2010, having travelled more than 7.7 km. Opportunity sent its last communication during a severe dust storm in June 2018, by which time it had moved 45 km.



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The first Mars rover was the Sojourner, weighing just less than 10.5 kg, which landed in July 1997 as part of the Mars Pathfinder mission. It was operated through the Pathfinder base station, with which contact was lost in September 1997. During the intervening 85 Earth days, the Sojourner travelled just over 100 m.

- Find out more and follow Perseverance on an interactive map at <https://mars.nasa.gov/mars2020/>



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## MARS FACTS AND FIGURES

- Mars is about half the size of Earth, having a radius of 3 390 km.
- It is the fourth planet from the Sun, at an average distance of about 228 million km.
- One day on Mars takes a little over 24 hours. Martian days are called sols – short for ‘solar day’.
- Mars makes a complete orbit around the Sun (a year in Martian time) in 669.6 sols, equivalent to 687 Earth days.
- Mars is often called the red planet because iron minerals in the Martian soil oxidise, or rust, causing the surface and atmosphere to appear red.
- Mars was named by the ancient Romans for their god of war because its reddish colour was reminiscent of blood.
- Mars has two moons, Phobos and Deimos, named after the horses that pulled the chariot of the Greek god of war, Ares.
- Mars has a thin atmosphere made up mostly of carbon dioxide, argon, nitrogen and a small amount of oxygen and water vapour.
- The Martian atmosphere is too thin for liquid water to exist for long on the surface, but ice is found just under the surface in the polar regions, and salty brine seasonally flows down some hillsides and crater walls.
- The temperature on Mars can be as high as 20°C or as low as about –153°C.
- Strong winds sometimes create dust storms that cover much of the planet.
- The Olympus Mons, a volcano on Mars, is three times taller than Mount Everest.
- The Valles Marineris canyon is 4 800 km long, 320 km at its widest and 7 km at its deepest. That’s about 10 times the size of USA’s Grand Canyon.

<https://solarsystem.nasa.gov/planets/mars/in-depth/>

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