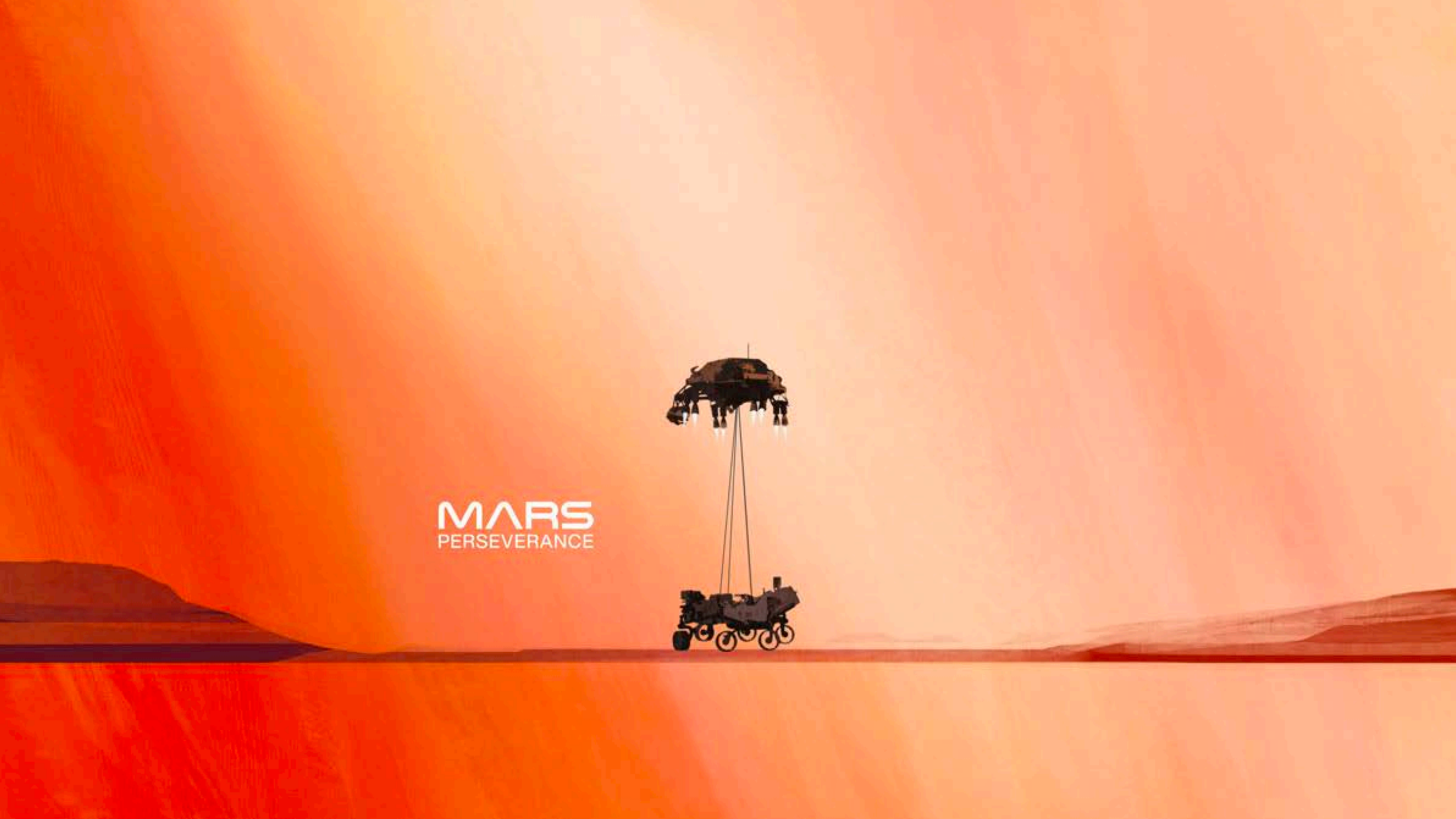
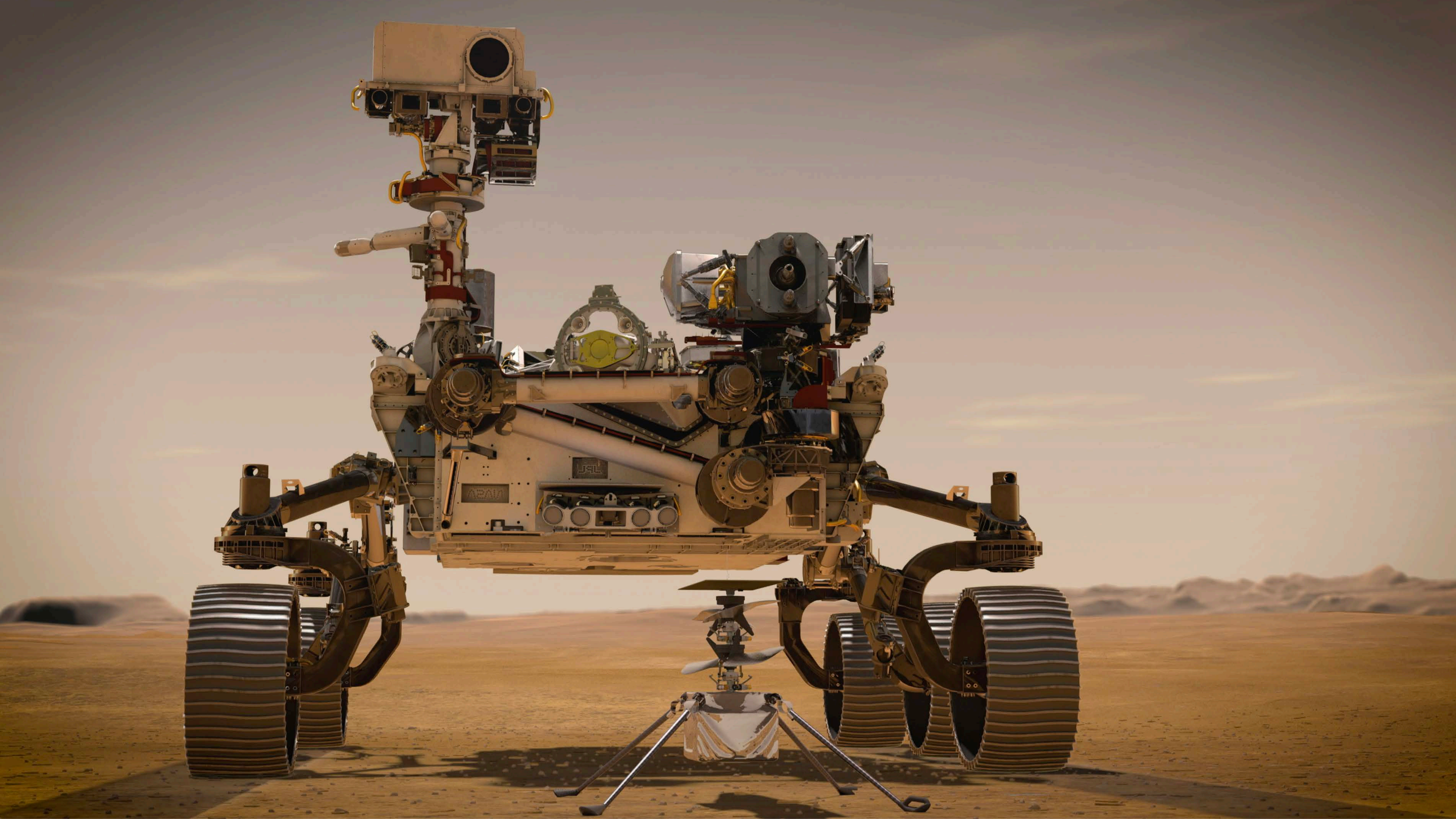

MARS
PERSEVERANCE

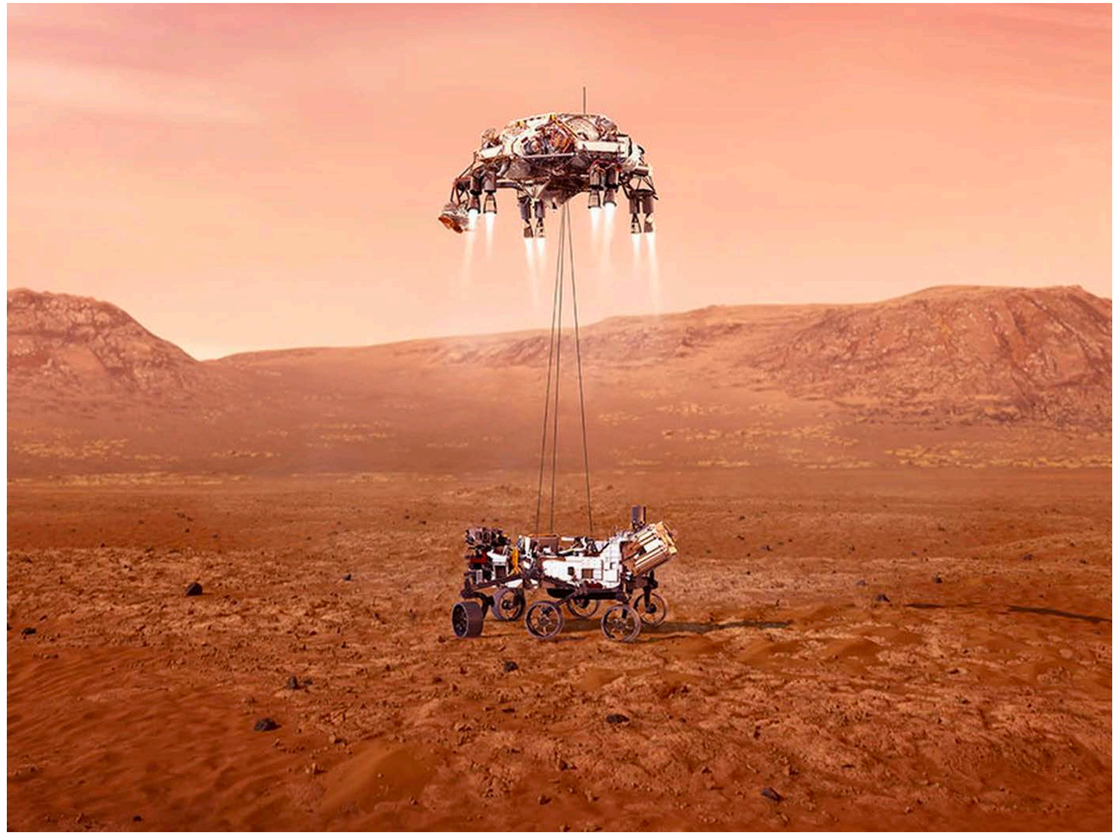


Perseverance Rover

Mission Overview

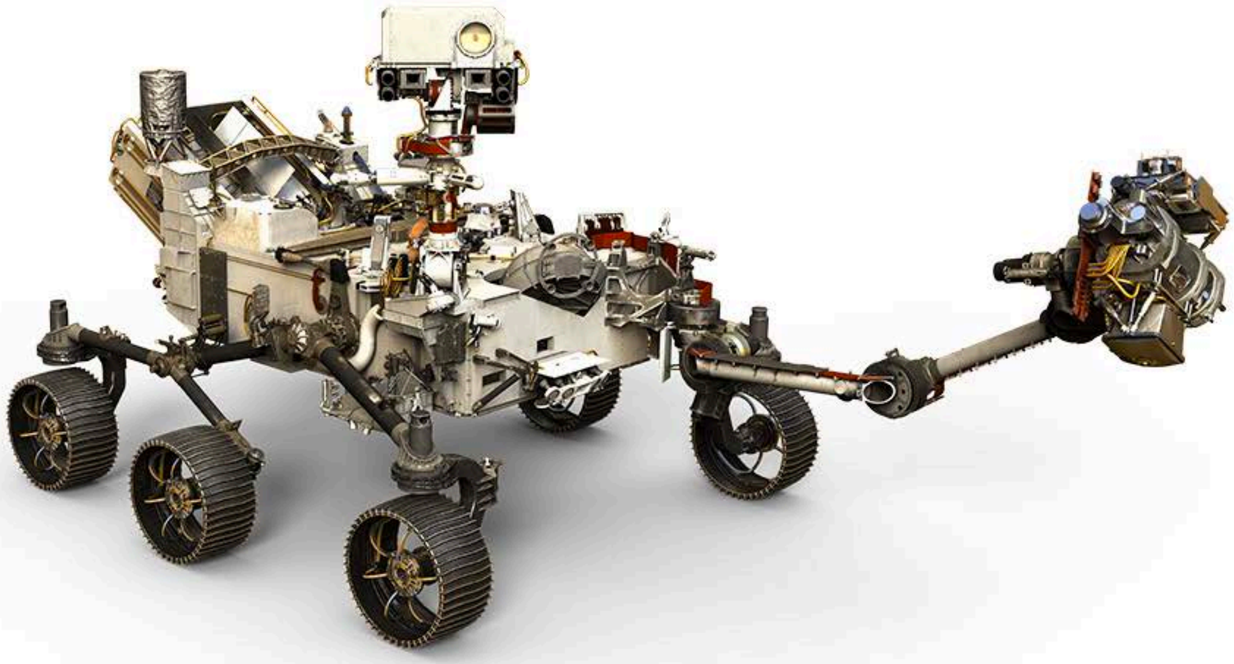
The Mars 2020/Perseverance rover is designed to better understand the geology of Mars and seek signs of ancient life.

The mission will collect and store a set of rock and soil samples that could be returned to Earth in the future. It will also test new Key Objectives.



Mission Timeline

- Launched in **August 2020** from Cape Canaveral Air Force Station, Florida
- Landed on Mars on **February 18, 2021** at the site of an ancient river delta in a lake that once filled Jezero Crater
- Spend **at least one Mars year** (two Earth years) exploring the landing site region

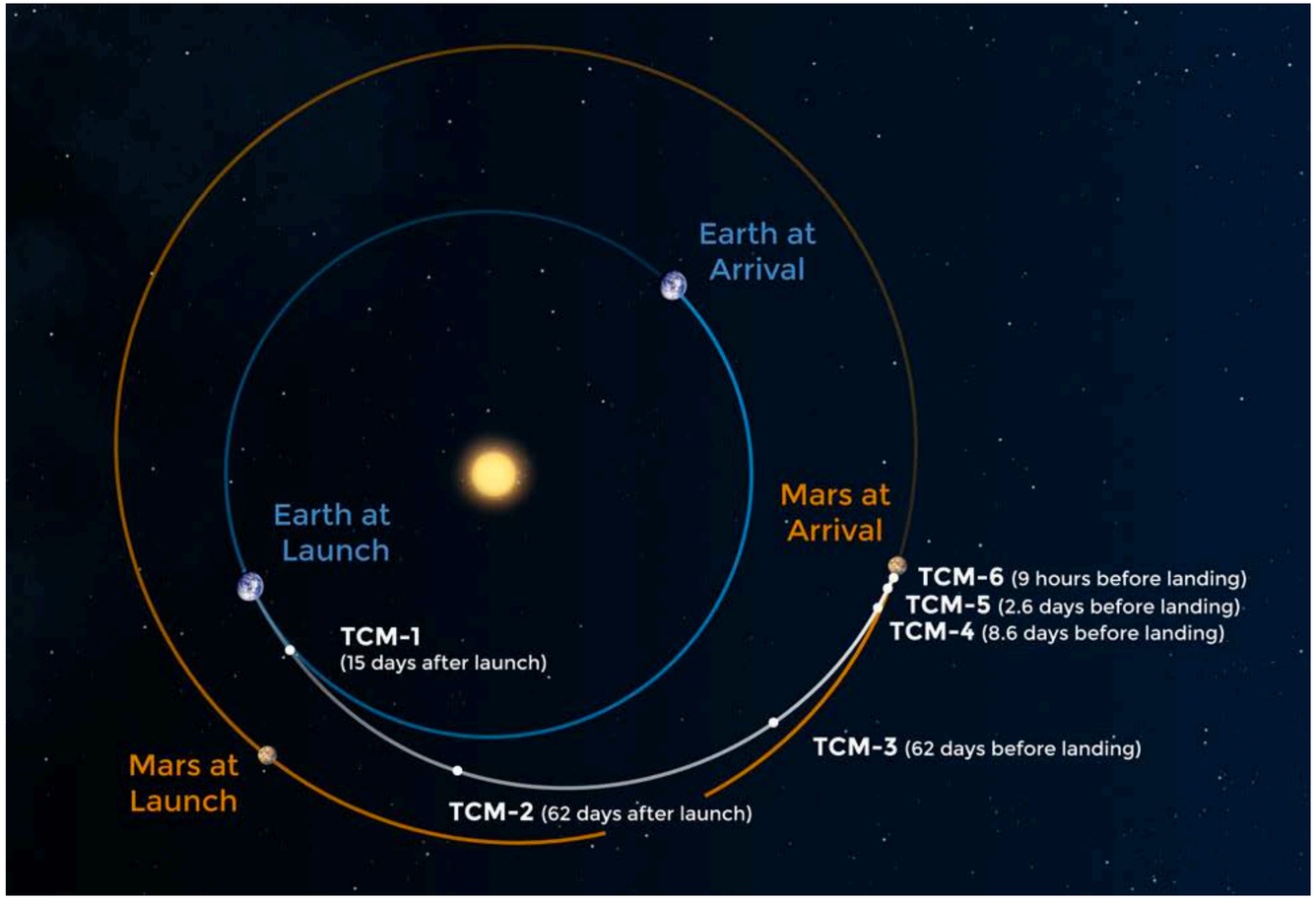


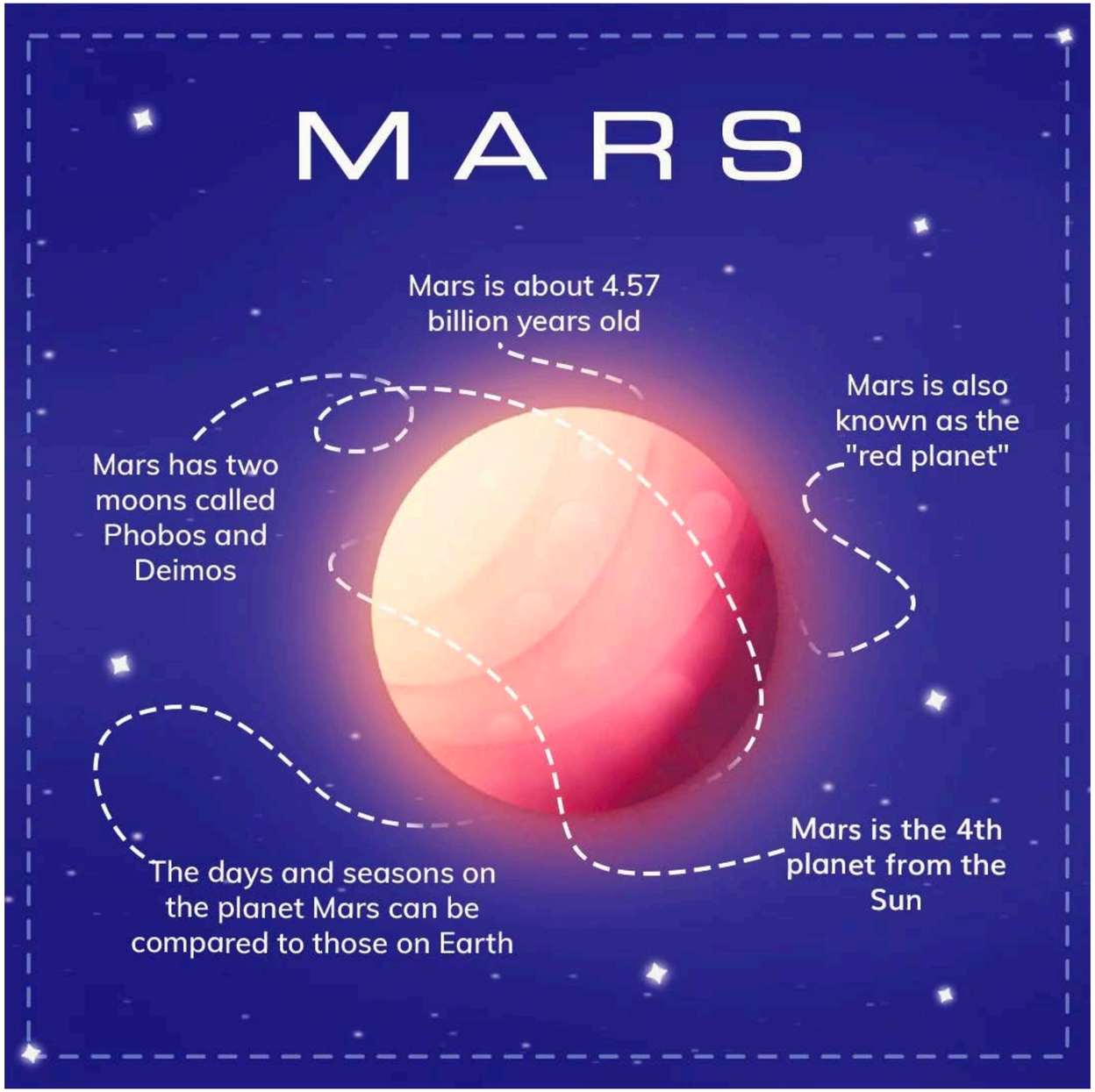
Journey to Mars

The cruise phase begins after the spacecraft separates from the rocket, soon after launch.

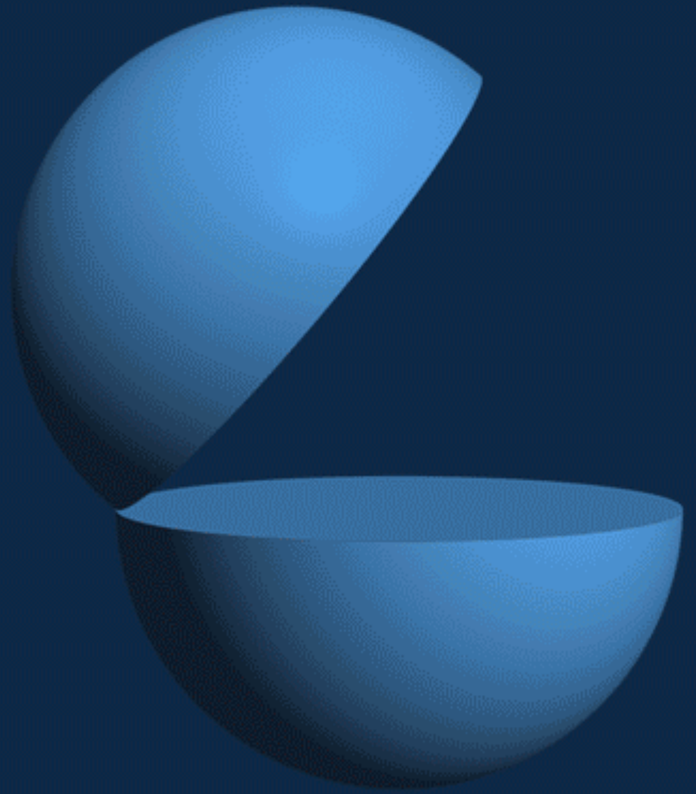
The spacecraft departs Earth at a speed of about 24,600 mph (about 39,600 kph).

The trip to Mars took about seven months and about 300 million miles (480 million kilometers).

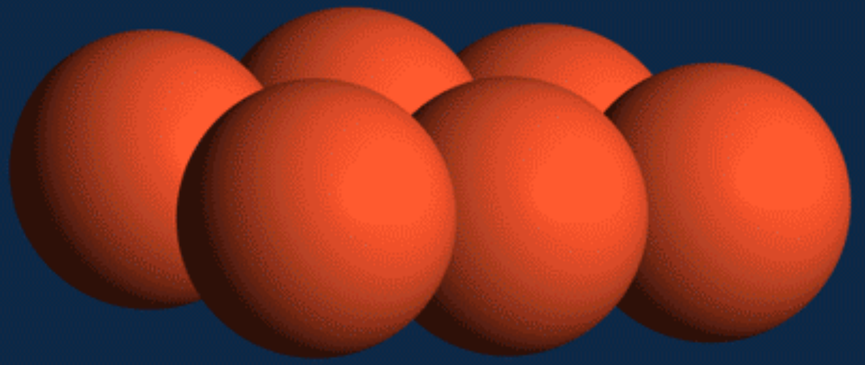



MARS
Mars is about 4.57 billion years old
Mars is also known as the "red planet"
Mars has two moons called Phobos and Deimos
Mars is the 4th planet from the Sun
The days and seasons on the planet Mars can be compared to those on Earth

MARS FACTS / VOLUME



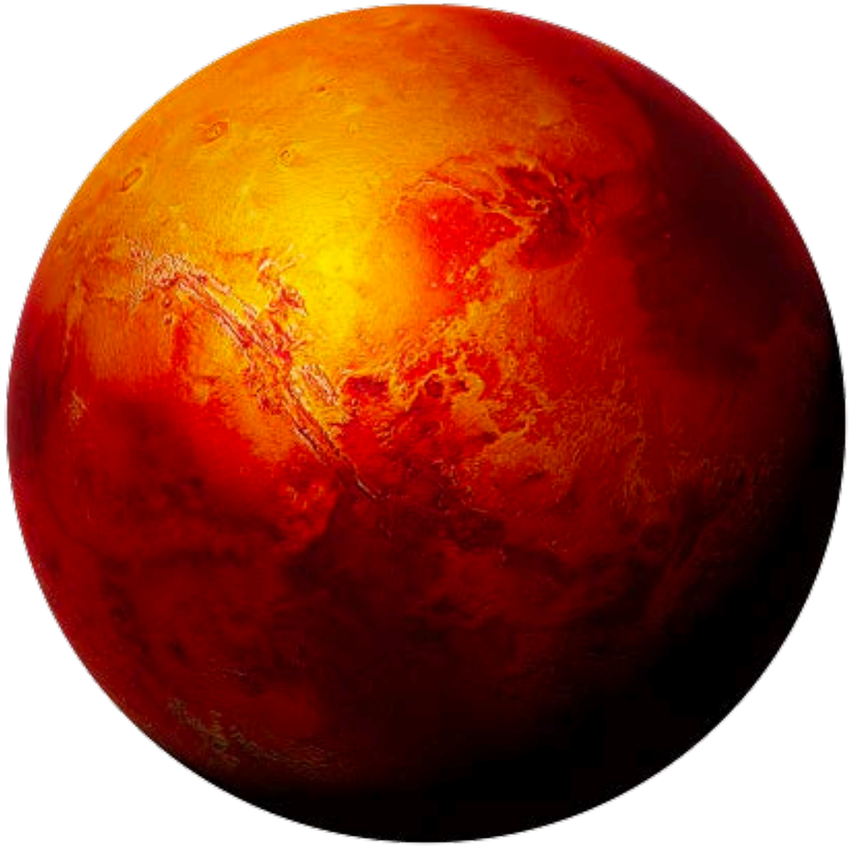
It would take more than six of Mars to fill the volume of Earth.



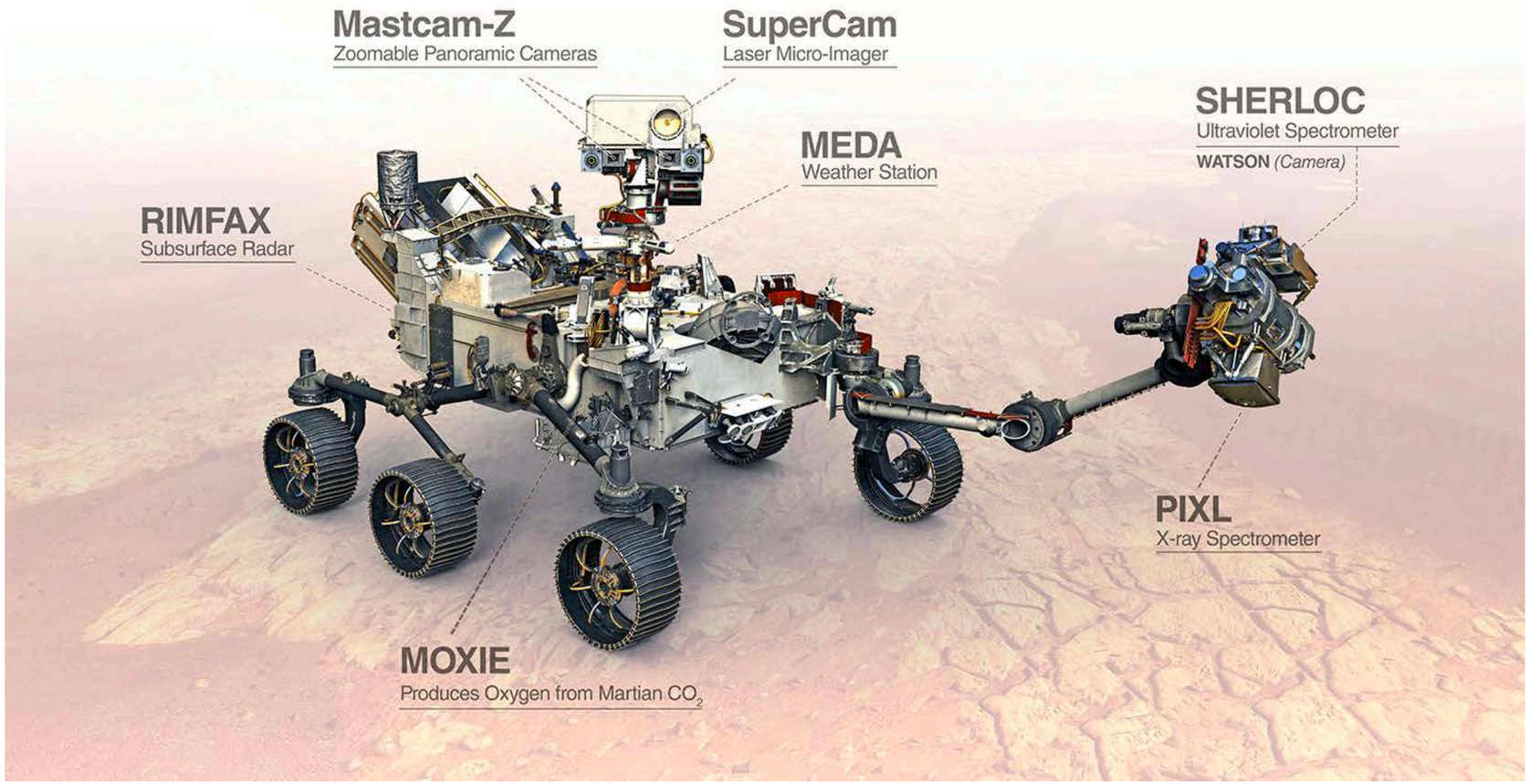
#JOURNEYTOMARS
mars.nasa.gov

Key Objectives

- Explore a geologically diverse landing site
- Assess ancient habitability
- Seek signs of ancient life, particularly in special rocks known to preserve signs of life over time
- Gather rock and soil samples that could be returned to Earth by a future NASA mission
- Demonstrate technology for future robotic and human exploration

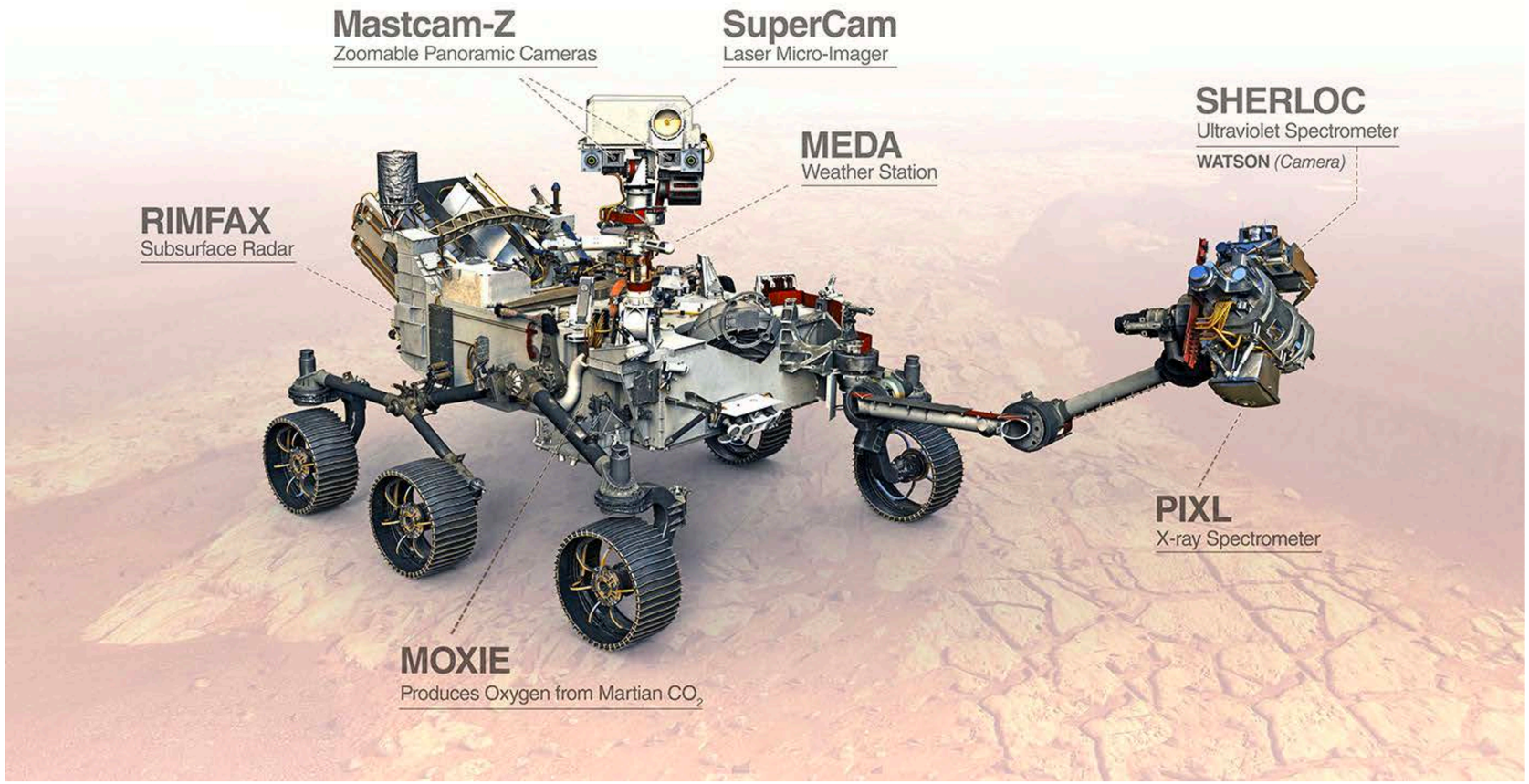


Technology and Hardware



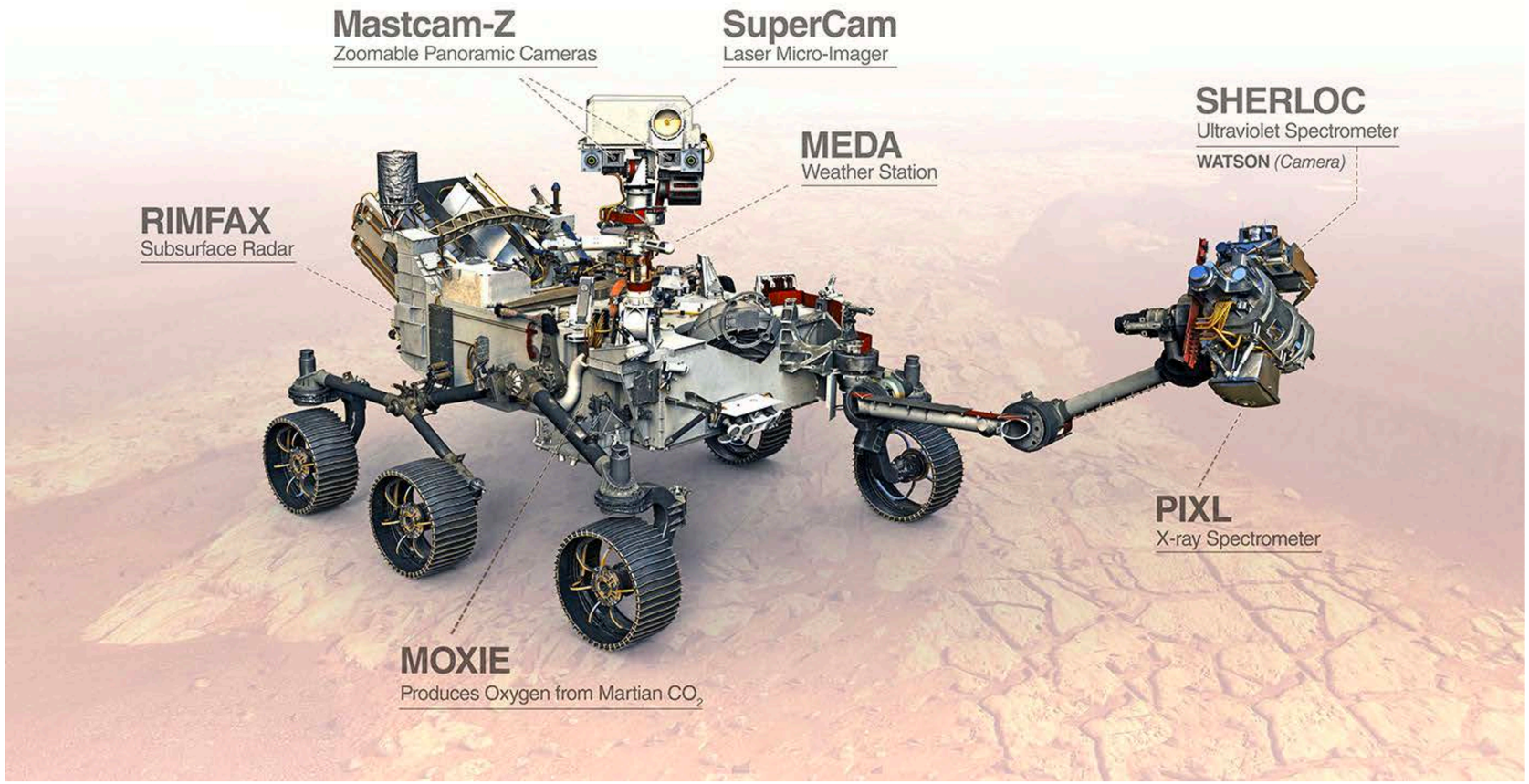
Mastcam-Z, an advanced camera system with panoramic and stereoscopic imaging capability with the ability to zoom.

Technology and Hardware



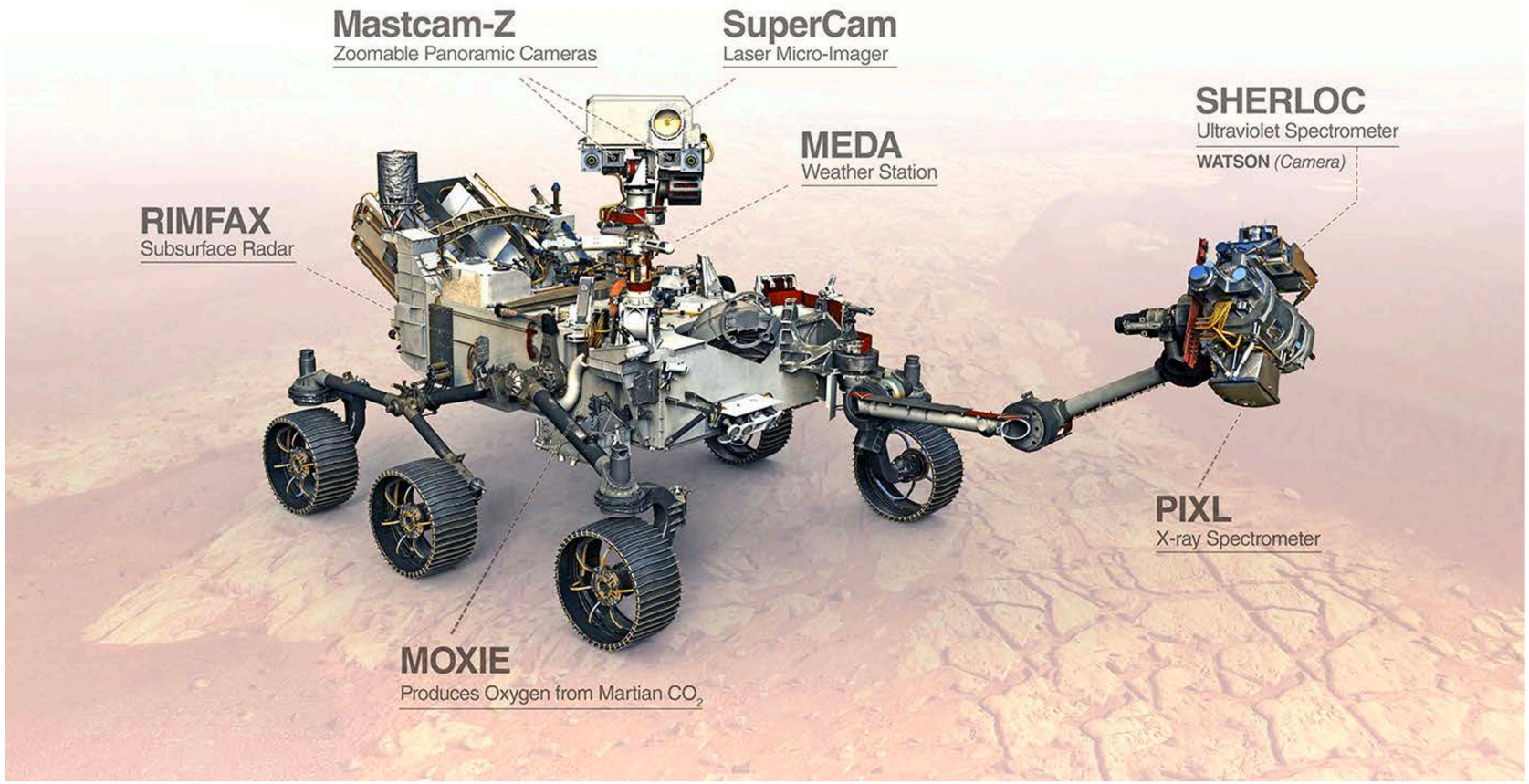
SuperCam, an instrument that can provide imaging, chemical composition analysis, and mineralogy at a distance.

Technology and Hardware



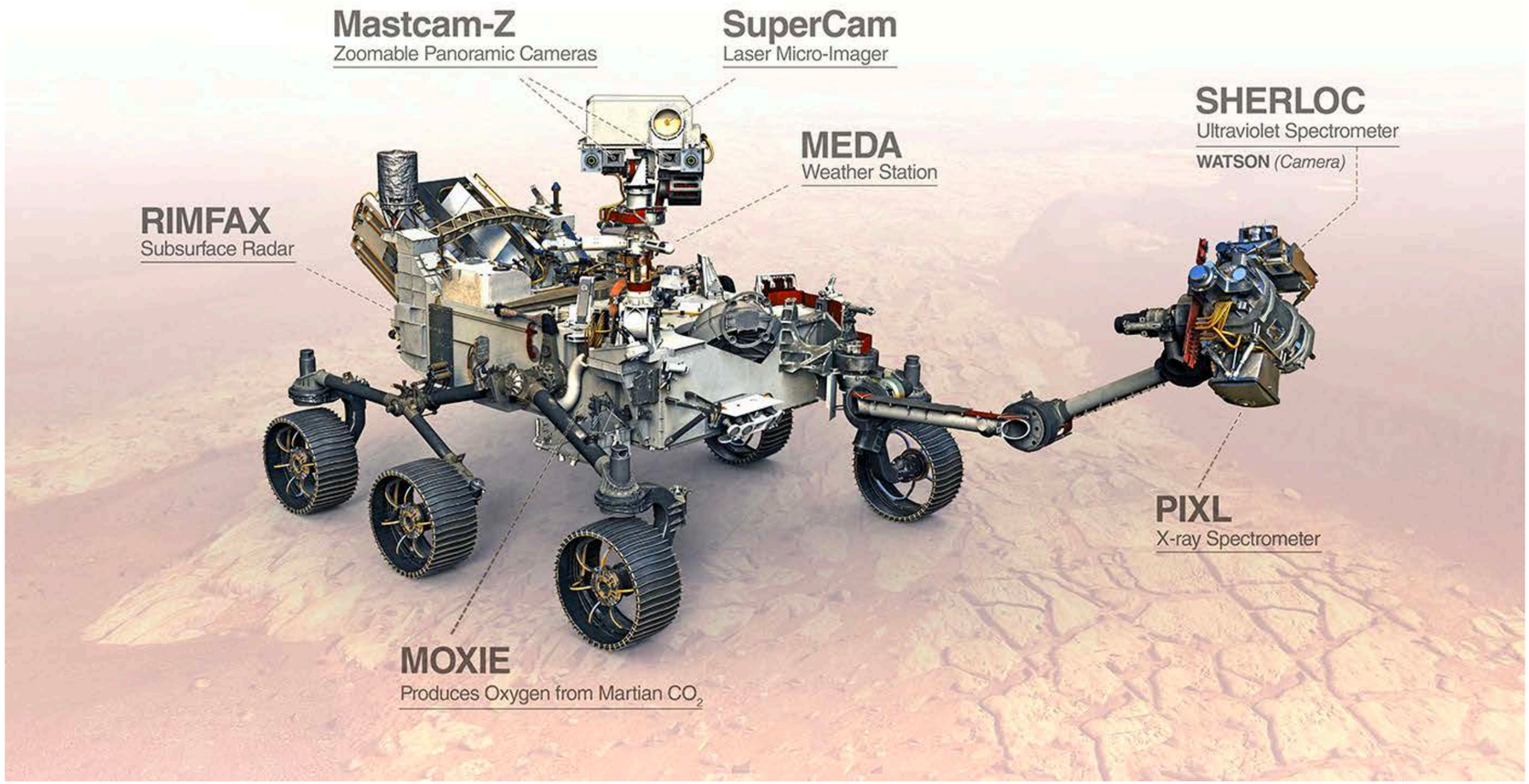
Planetary Instrument for X-ray Lithochemistry (PIXL), an X-ray fluorescence spectrometer and high-resolution imager to map the fine-scale elemental composition of Martian surface materials.

Technology and Hardware



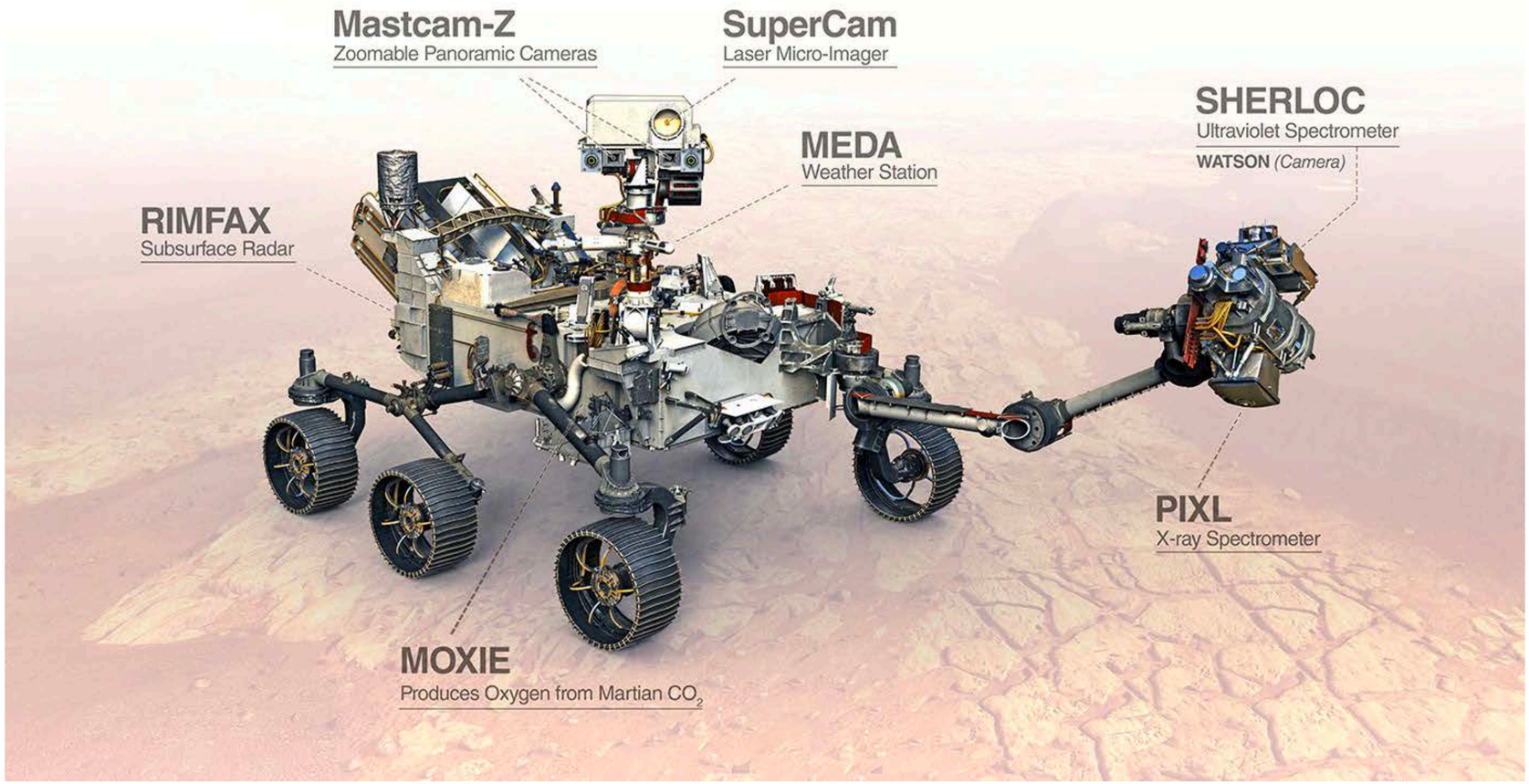
Scanning Habitable Environments with Raman & Luminescence for Organics and Chemicals (SHERLOC), a spectrometer that will provide fine-scale imaging and uses an ultraviolet (UV) laser to map mineralogy and organic compounds.

Technology and Hardware



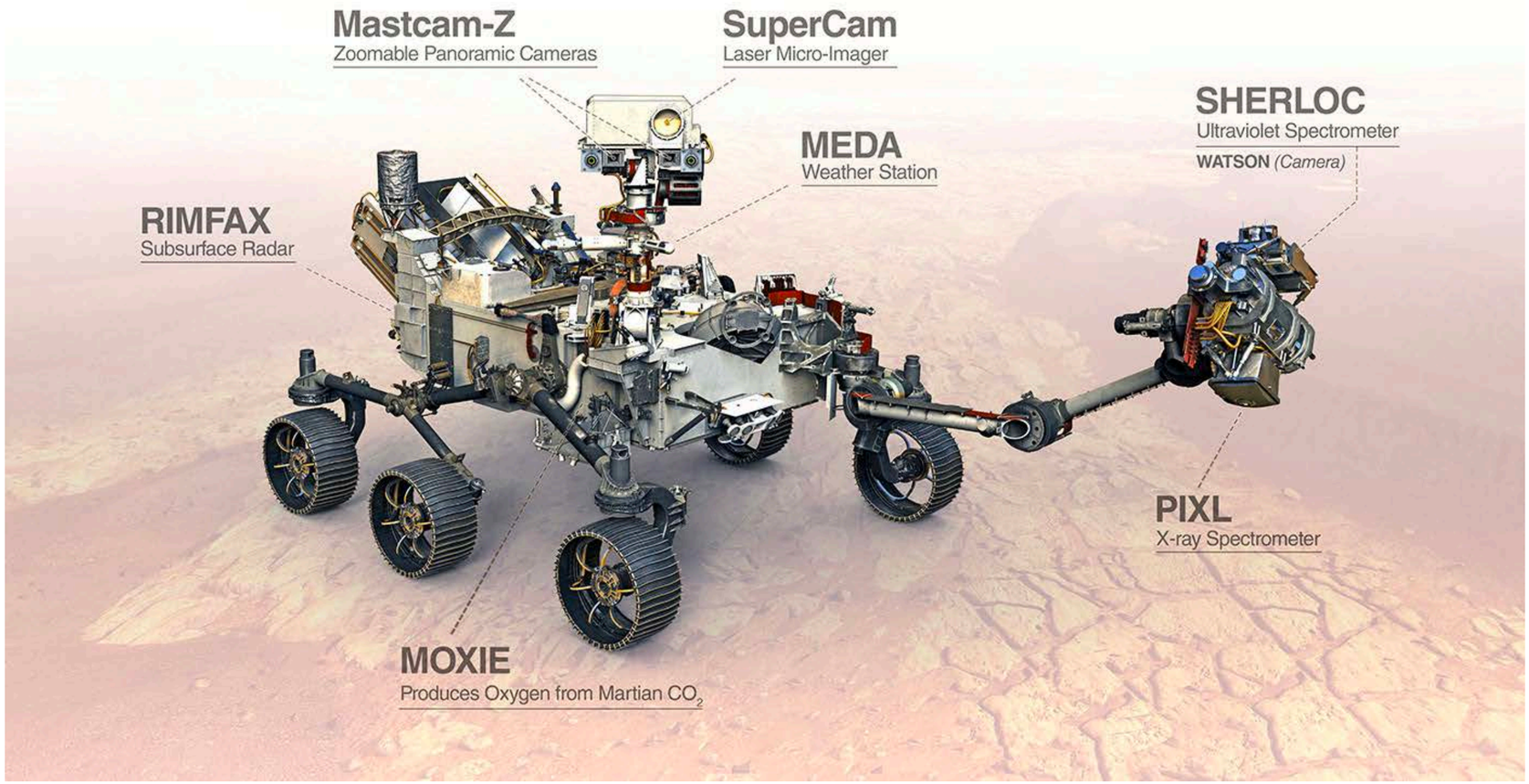
The Mars Oxygen In-Situ Resource Utilization Experiment (MOXIE), a technology demonstration that will produce oxygen from Martian atmospheric carbon dioxide.

Technology and Hardware



Mars Environmental Dynamics Analyzer (MEDA), a set of sensors that will provide measurements of temperature, wind speed and direction, pressure, relative humidity, and dust size and shape.

Technology and Hardware



The Radar Imager for Mars' Subsurface Experiment (RIMFAX), a ground-penetrating radar that will provide centimeter-scale resolution of the geologic structure of the subsurface.

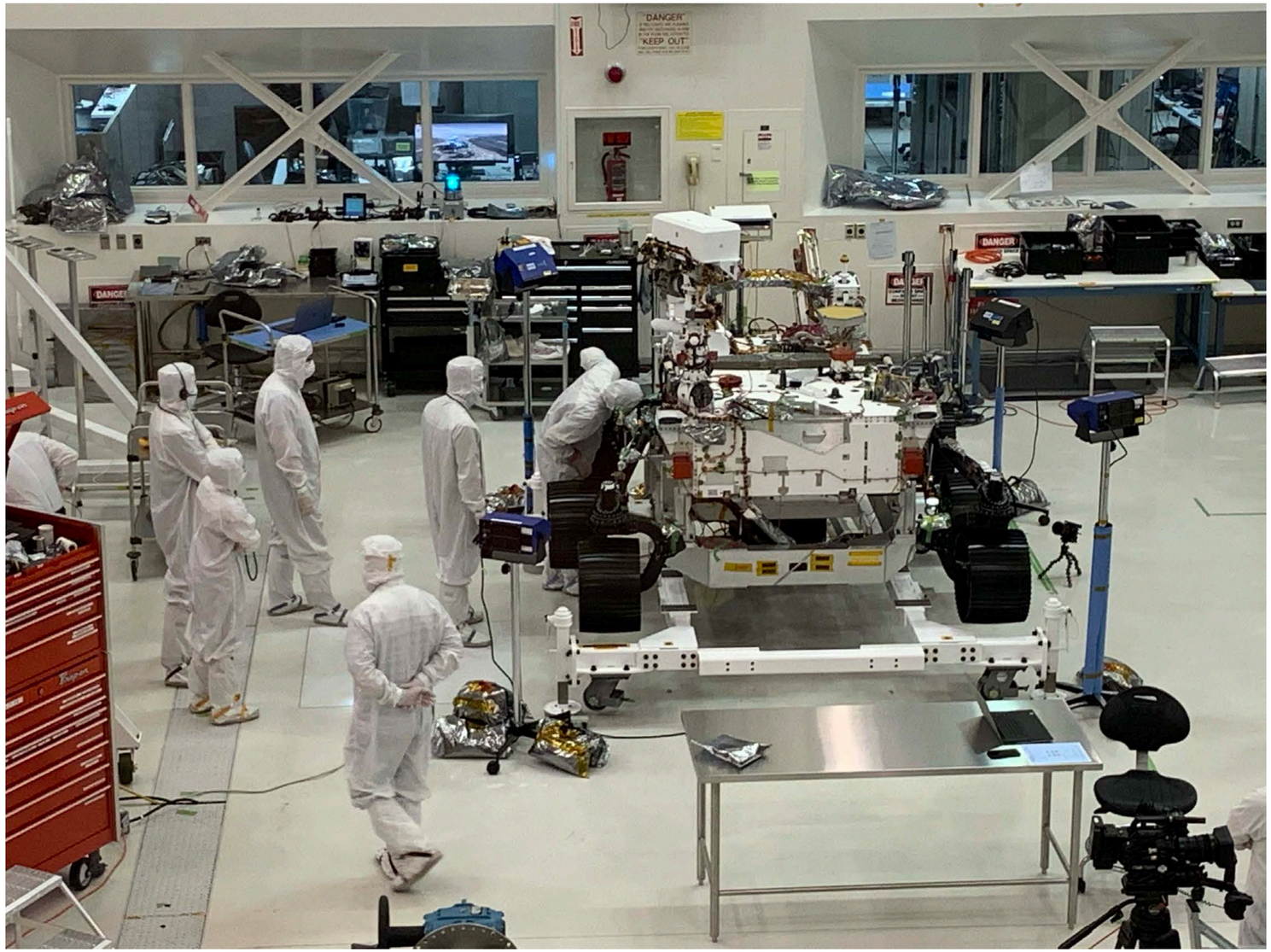
Ingenuity Helicopter

The Mars Helicopter, Ingenuity, is a small, autonomous aircraft that was carried to the surface of the Red Planet attached to the belly of the Perseverance rover.

Its mission is experimental in nature and completely independent of the rover's science mission.

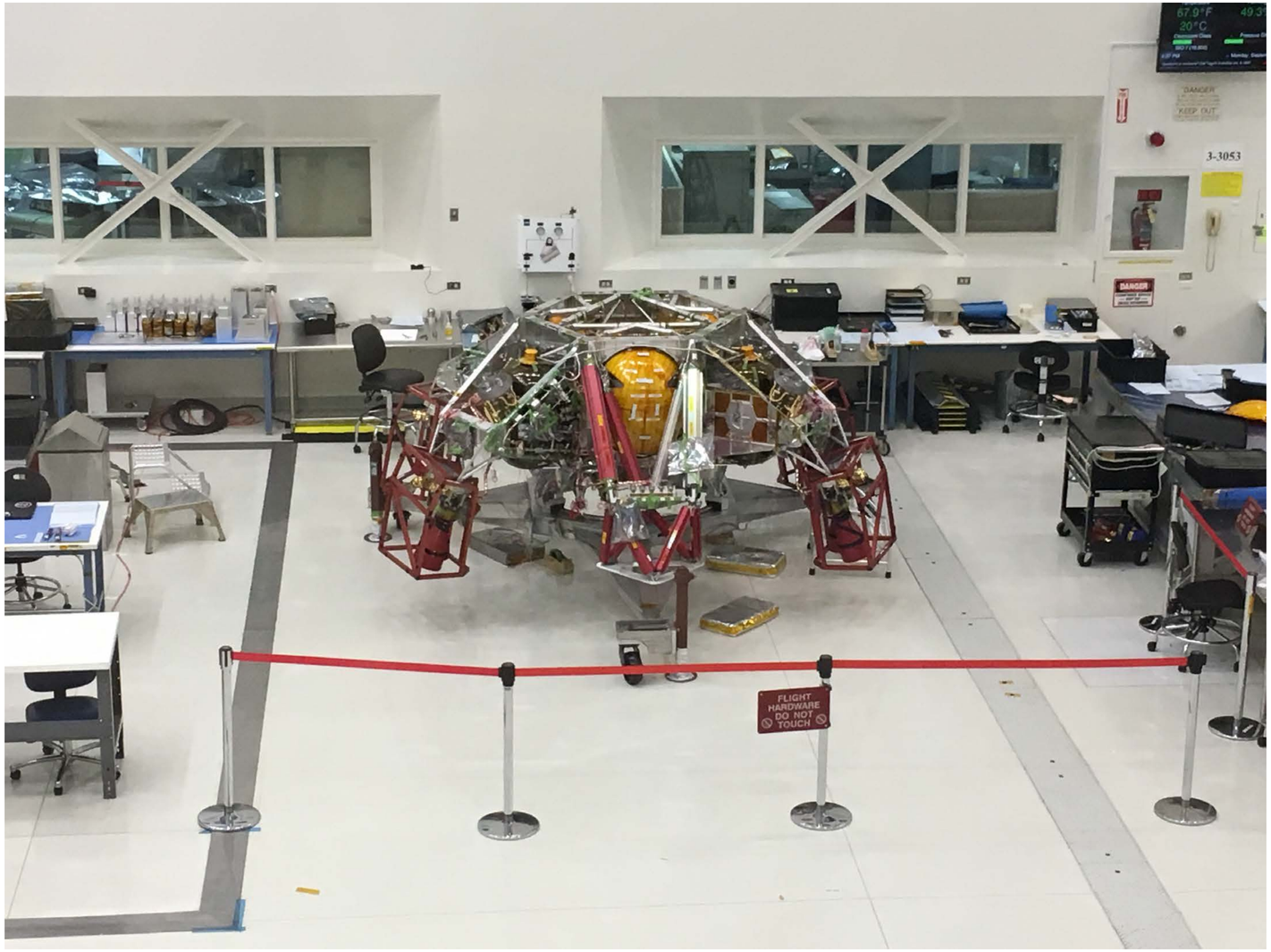
Ingenuity became the first powered flight in Mar's thin air.

Building the Rover



Building the Rover

Building the Rover



Mission Control

Mission Control

Testing the Rover

Testing the Rover

Testing the Rover

Building the Rover

3D Model