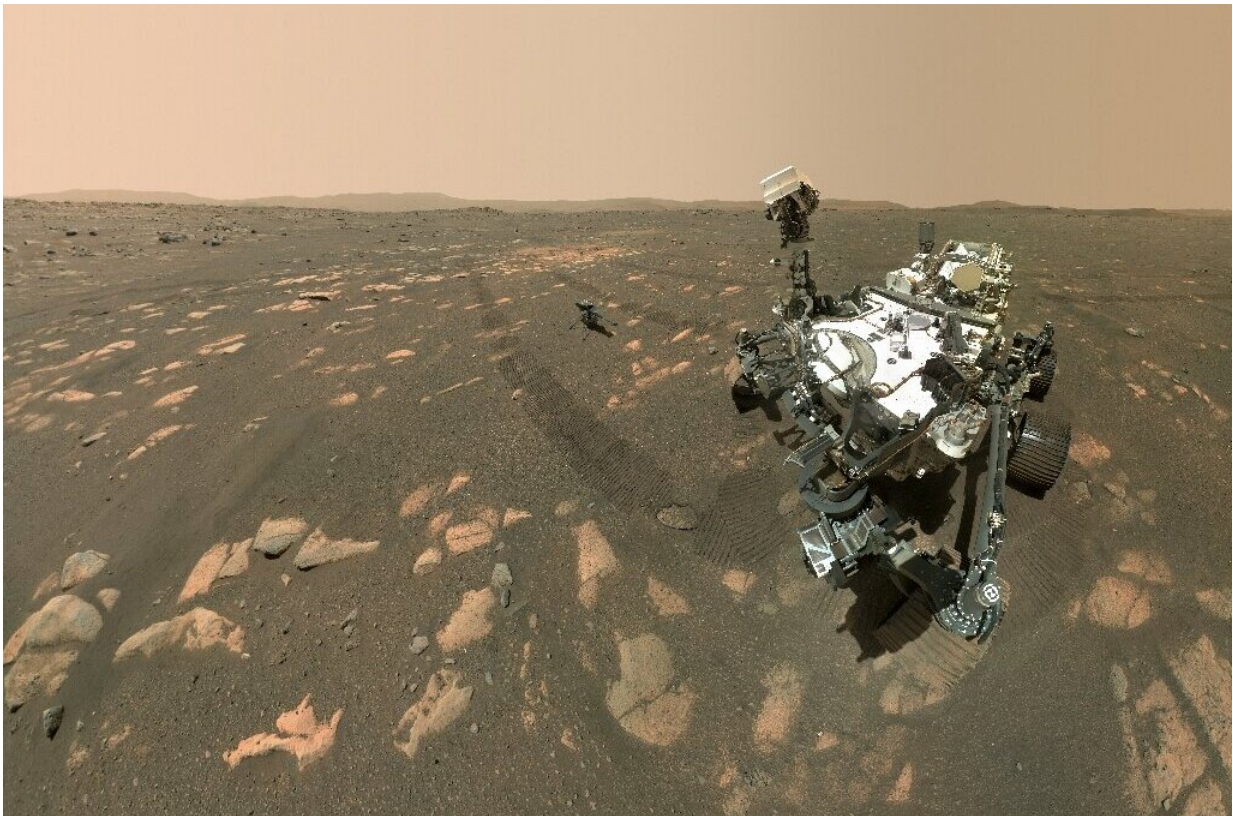


In first, Perseverance Mars rover makes oxygen on another planet

April 22 2021



NASA's Perseverance rover has converted some carbon dioxide from the Martian atmosphere into oxygen, the first time this has happened on another planet

NASA's Perseverance rover keeps making history.

The six-wheeled robot has converted some [carbon dioxide](#) from the Martian atmosphere into oxygen, the first time this has happened on another planet, the [space agency](#) said Wednesday.

"This is a critical first step at converting [carbon](#) dioxide to oxygen on Mars," said Jim Reuter, associate administrator for NASA's space technology mission directorate.

The technology demonstration took place on April 20, and it's hoped future versions of the experimental instrument that was used could pave the way for future human exploration.

Not only can the process produce oxygen for future astronauts to breathe, but it could make hauling vast amounts of oxygen over from Earth to use as rocket propellant for the return journey unnecessary.

The Mars Oxygen In-Situ Resource Utilization Experiment—or MOXIE—is a golden box the size of a car battery, and is located inside the front right side of the rover.

Dubbed a "mechanical tree," it uses electricity and chemistry to split carbon dioxide molecules, which are made up of one carbon atom and two [oxygen atoms](#).

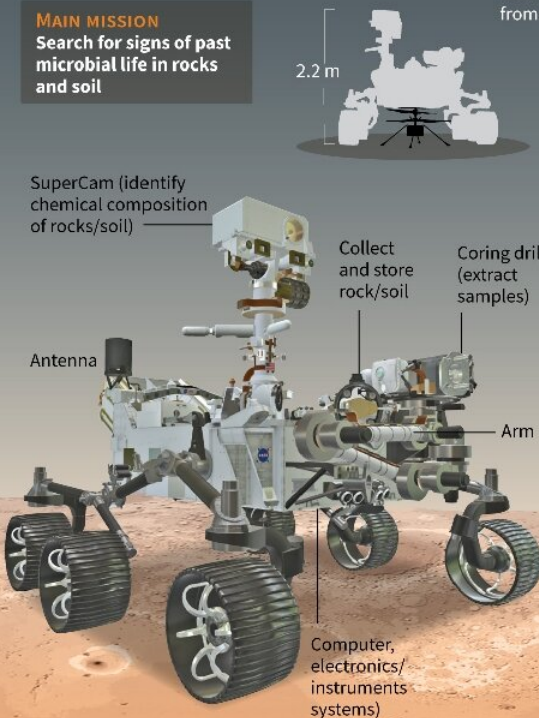
NASA's Mars Perseverance rover and helicopter

- Launched: July 30, 2020
- Landed: February 18, 2021
- Mission duration: At least 1 Mars year (687 Earth days)

PERSEVERANCE ROVER

MAIN MISSION
Search for signs of past microbial life in rocks and soil

2.2 m

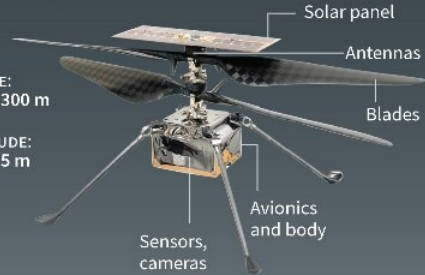


INGENUITY HELICOPTER

MAIN MISSION
First test of a powered flight on another planet

Take off, fly, and land with minimal commands from Earth sent in advance

RANGE: up to 300 m
ALTITUDE: up to 5 m



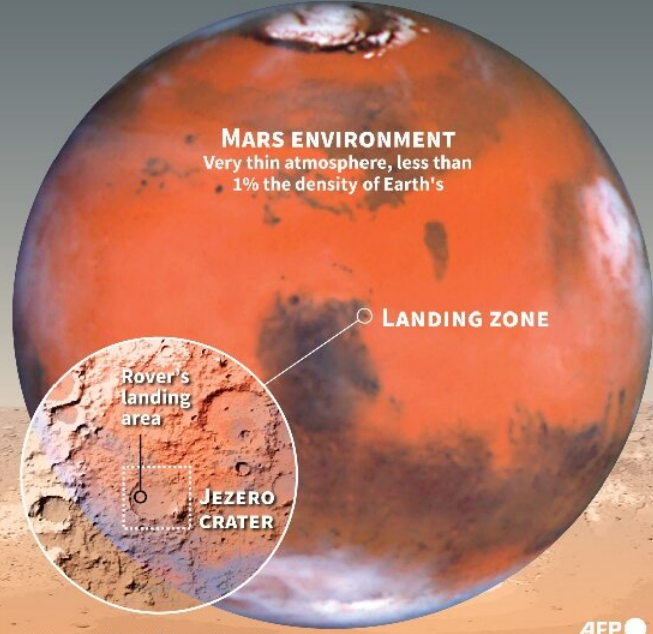
MARS ENVIRONMENT

Very thin atmosphere, less than 1% the density of Earth's


LANDING ZONE

Rover's landing area

JEZERO CRATER



Source: NASA/MOLA Photos: NASA/JPL-Caltech Steve Lee (University of Colorado), Jim Bell (Cornell University), Mike Wolff (Space Science Institute)

AFP 

The Mars Perseverance rover and Ingenuity helicopter which landed safely on Mars on February 18.

It also produces carbon monoxide as a byproduct.

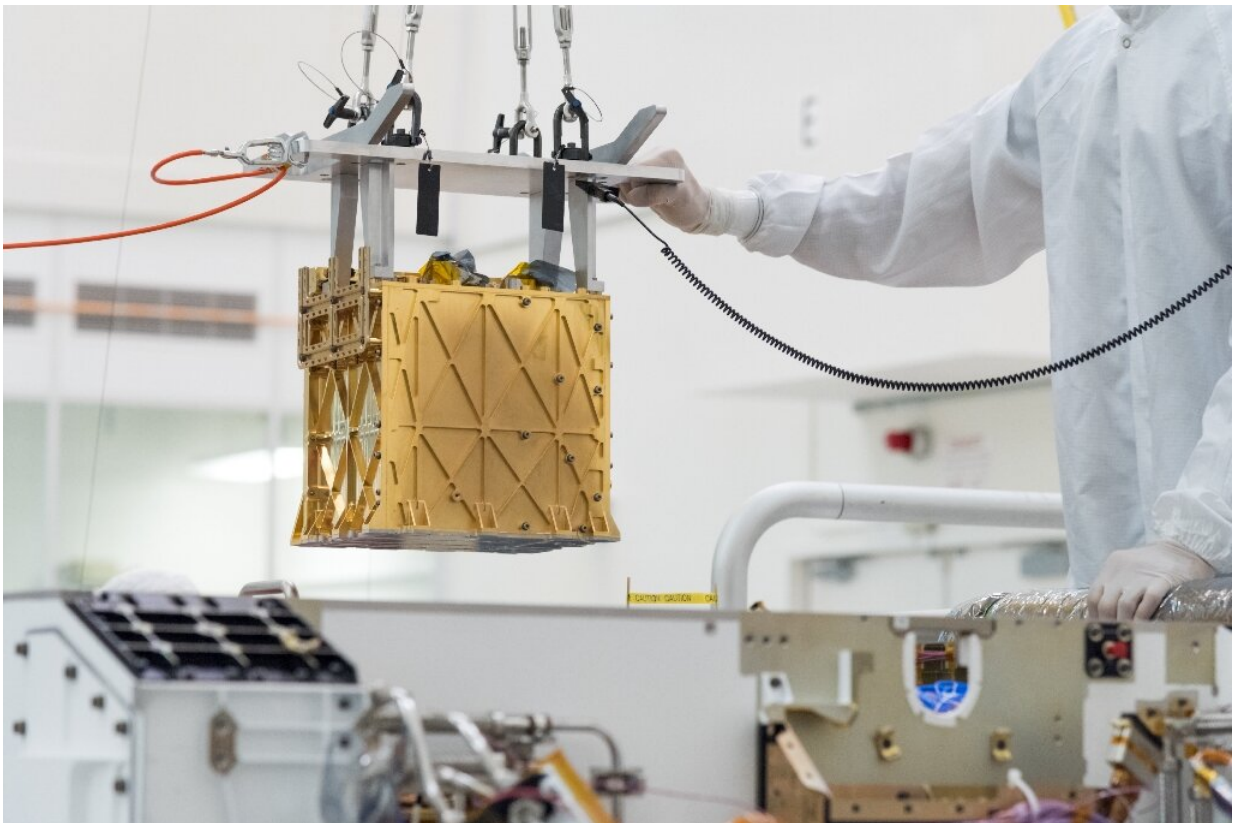
In its first run, MOXIE produced 5 grams of oxygen, equivalent to about 10 minutes of breathable oxygen for an astronaut carrying out normal activity.

MOXIE's engineers will now run more tests and try to step up its output. It is designed to be able to generate up to 10 grams of oxygen per hour.

Designed at the Massachusetts Institute of Technology, MOXIE was built with heat-resistant materials like nickel alloy and designed to tolerate the searing temperatures of 1,470 degrees Fahrenheit (800 Celsius) required for it to run.

A thin gold coating ensures it doesn't radiate its heat and harm the rover.

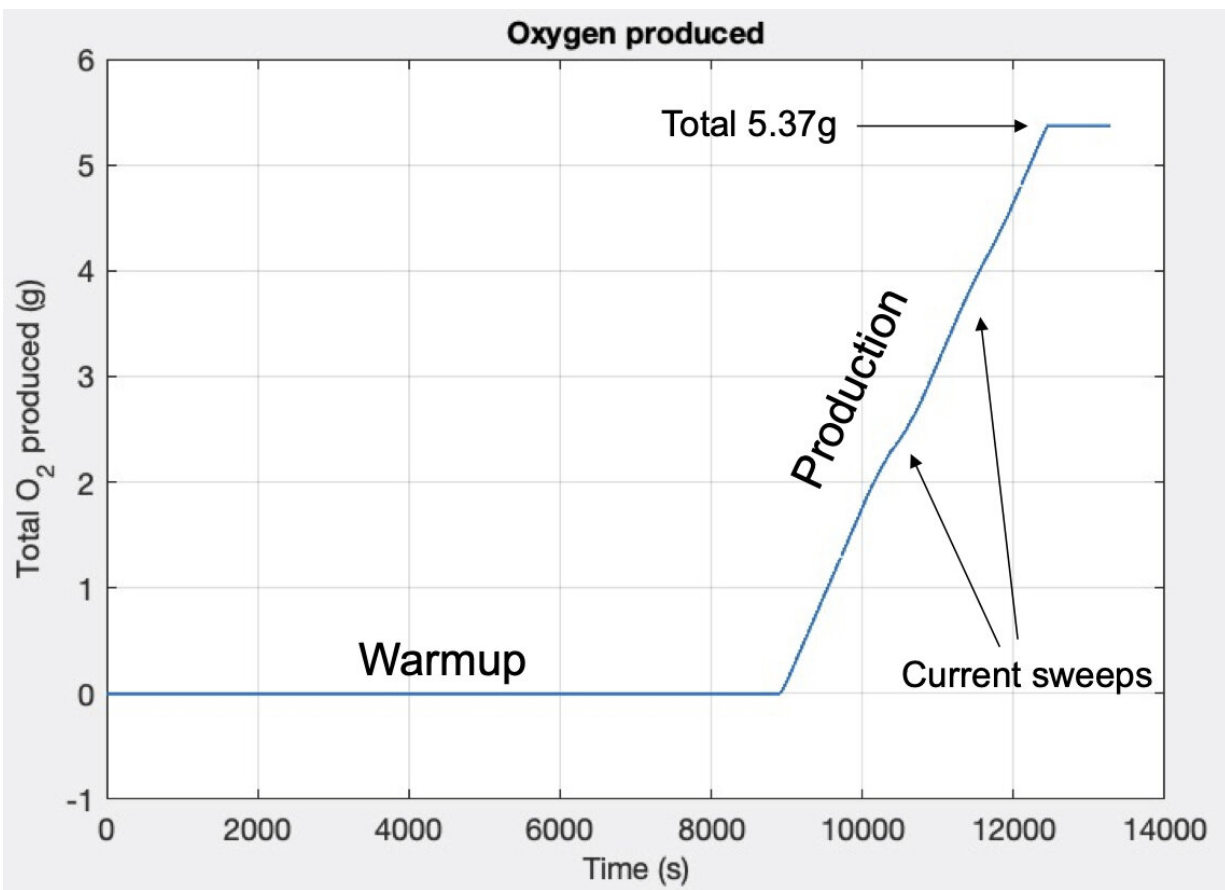
MIT engineer Michael Hecht said a one ton version of MOXIE could produce the approximately 55,000 pounds (25 tons) of oxygen needed for a rocket to blast off from Mars.



This handout photo obtained April 21, 2021 and released by NASA/JPL shows technicians in the clean room carefully lowering the Mars Oxygen In-Situ Resource Utilization Experiment (MOXIE) instrument into the belly of the Perseverance rover

Producing oxygen from Mars' 96 percent carbon dioxide atmosphere might be a more feasible option than extracting ice from under its surface then electrolyzing it to make [oxygen](#).

Perseverance landed on the Red Planet on February 18 on a mission to search for signs for microbial life.



After a 2-hour warmup period MOXIE began producing oxygen at a rate of 6 grams per hour. The was reduced two times during the run (labeled as “current sweeps”) in order to assess the status of the instrument. After an hour of operation the total oxygen produced was about 5.4 grams, enough to keep an astronaut healthy for about 10 minutes of normal activity. Credit: MIT Haystack Observatory

Its mini helicopter Ingenuity made history this week by achieving the first powered flight on another planet.

The rover itself has also directly recorded the sounds of Mars for the first time.

More information: NASA: www.nasa.gov/press-release/nasa-engineers-produce-oxygen-from-red-planet

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