

National Aeronautics and
Space Administration

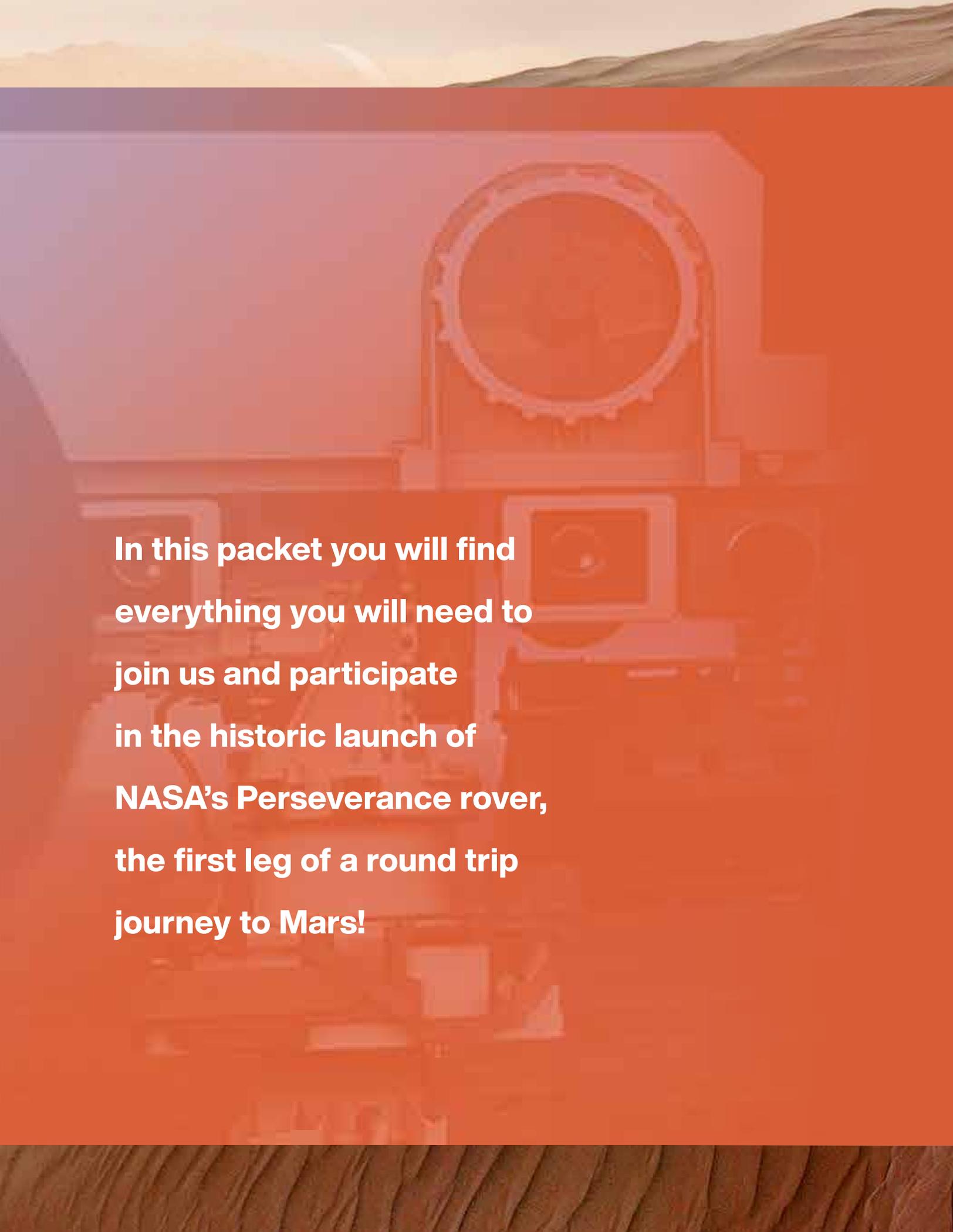


MARS 2020 PERSEVERANCE





WELCOME
TO YOUR
VIRTUAL
LAUNCH
PACKET!



**In this packet you will find
everything you will need to
join us and participate
in the historic launch of
NASA's Perseverance rover,
the first leg of a round trip
journey to Mars!**

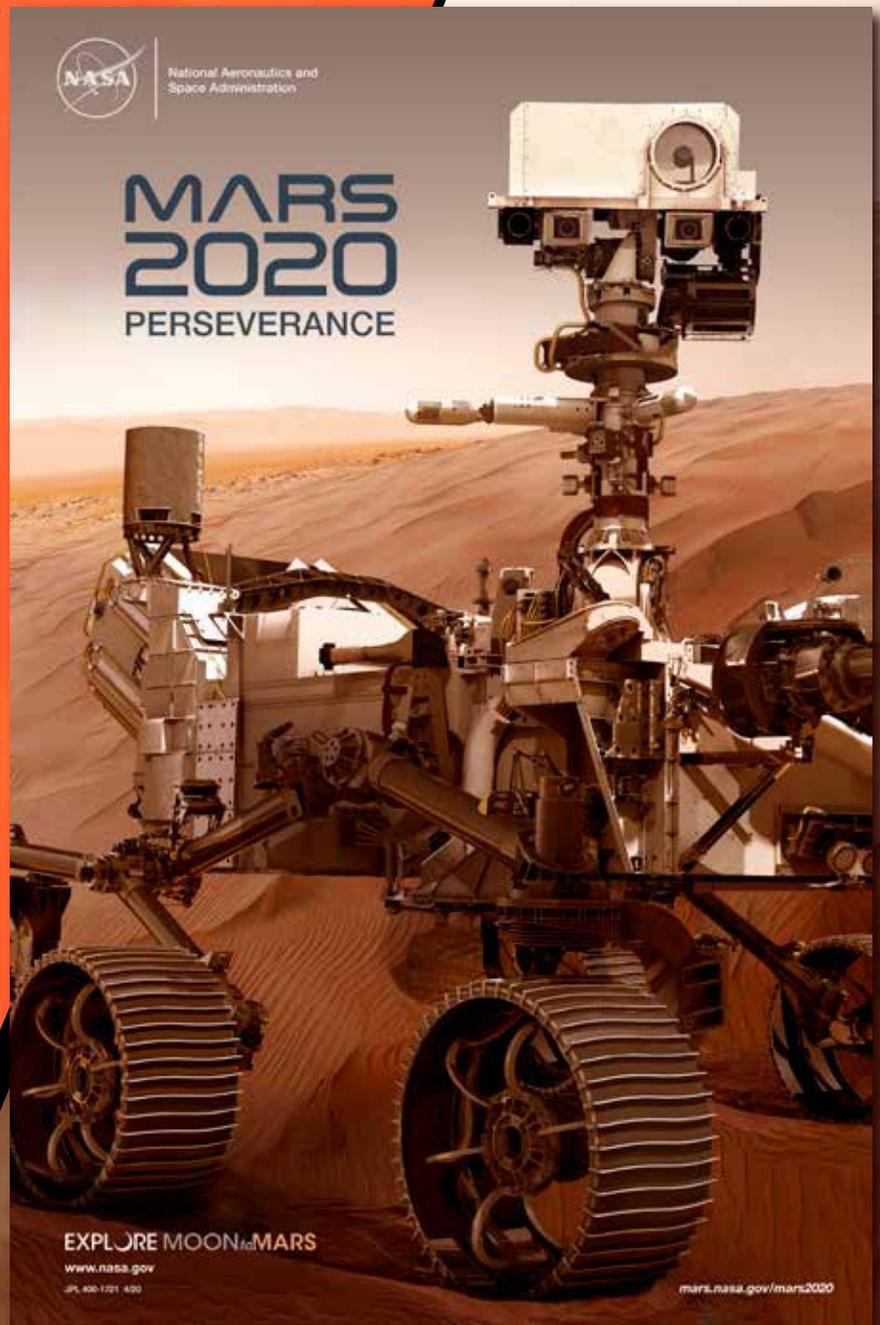


ABOUT THE MARS 2020 MISSION

The Perseverance rover will seek signs of ancient life and collect rock and soil samples for possible return to Earth.

Perseverance will land in Jezero Crater, a place that holds promise for finding evidence of past microbial life.

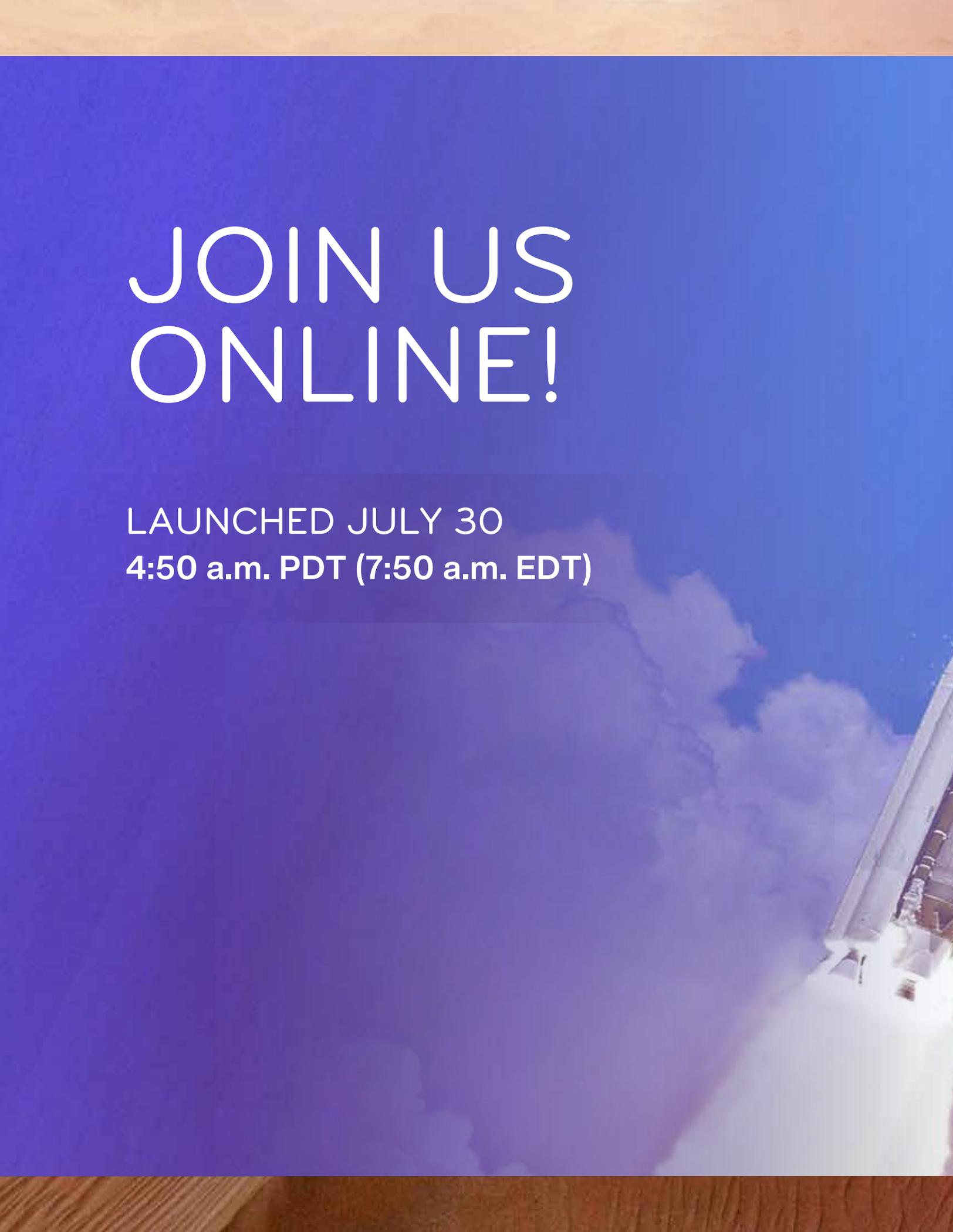
The rover will collect the most compelling rock samples and store them on the Martian surface for possible return to Earth by a future mission.

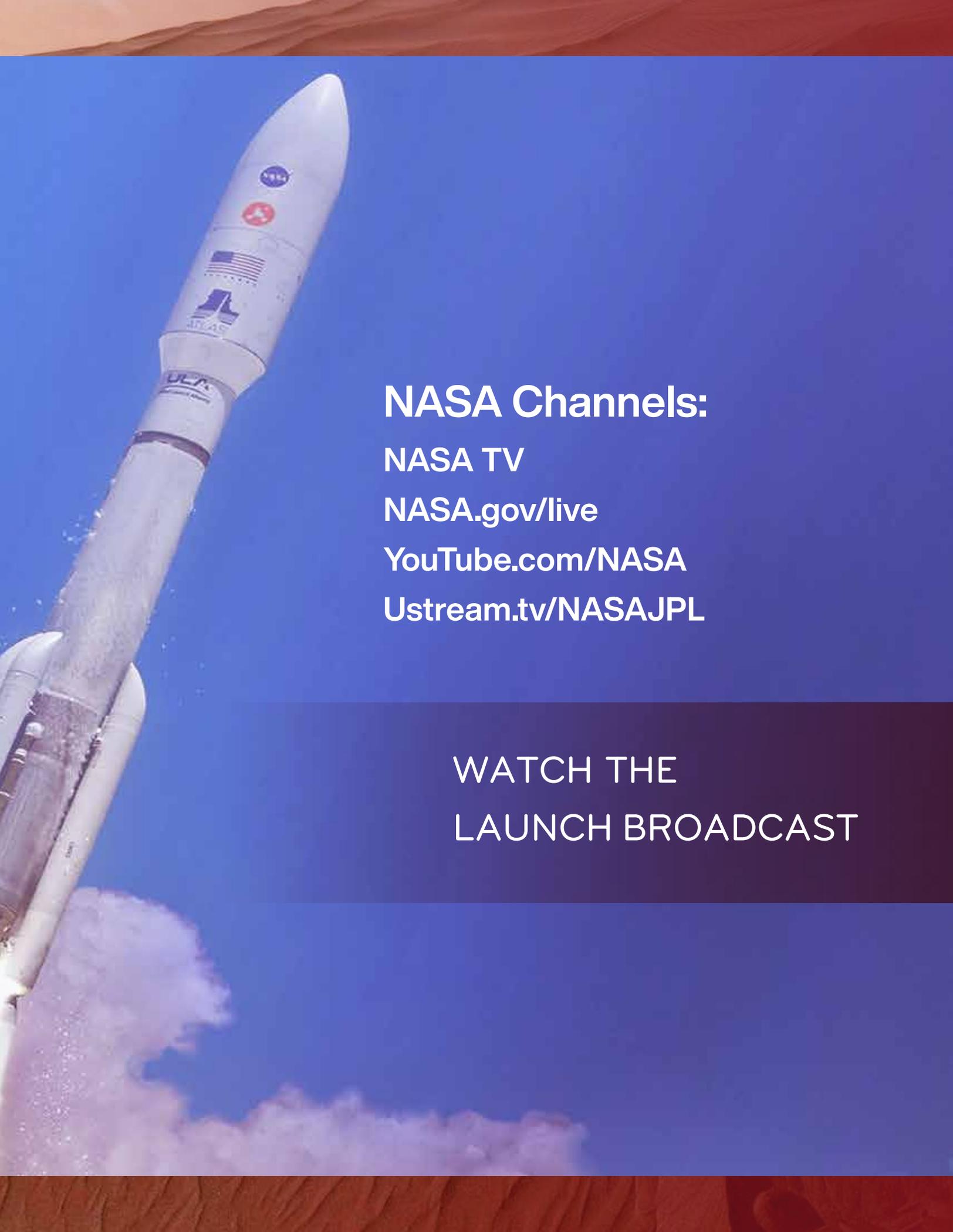


- ✦ **Download this poster for your home Mission Control.**
- ✦ **Learn how the rover collects samples here.**

JOIN US ONLINE!

LAUNCHED JULY 30
4:50 a.m. PDT (7:50 a.m. EDT)





NASA Channels:

NASA TV

NASA.gov/live

YouTube.com/NASA

Ustream.tv/NASAJPL

WATCH THE
LAUNCH BROADCAST

ROVER QUICK FACTS

A stylized orange silhouette of a rover is positioned in the upper right quadrant of the page. The rover's body is rectangular with a circular window on the right side. It has a long, thin arm extending downwards from the front. The background is a warm gradient from light yellow at the top to dark orange at the bottom. The title 'ROVER QUICK FACTS' is written in a large, dark blue, sans-serif font, with 'ROVER' on the first line and 'QUICK FACTS' on the second line.

ROVER NAME

Perseverance

MAIN JOB

The Perseverance rover will seek signs of ancient life and collect rock and soil samples for possible return to Earth.

NUMBER OF INSTRUMENTS

7, plus a mini arm inside the rover

CAMERAS

23, plus 2 microphones

SIZE

**Car-size, or about: 10 feet long (not including arm)
9 feet wide 7 feet tall (about 3 meters long,
2.7 meters wide, and 2.2 meters tall).**

WEIGHT

2,260 pounds (1,025 kilograms)



MARS 2020
PERSEVERANCE



✦ **Download this sticker**

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@NASAPersevere



A photograph of a desert landscape featuring rolling sand dunes in the foreground and distant mountains under a hazy, golden sky. The text is overlaid in the center.

RETRIEVE
YOUR
BOARDING
PASS!

If you submitted your name to the “Send Your Name to Mars” campaign, your flight is now boarding!

As a “flyer” on this mission, you will get a special stamp on your boarding pass.



Get your boarding passes now and tune in to watch the launch online.

Didn't participate yet?

Your name can fly on our NEXT mission to Mars.

✦ [Retrieve my boarding pass](#)

MISSION QUICK FACTS

LAUNCHED

July 30 at 4:50 a.m. PDT (7:50 a.m. EDT)

LAUNCH LOCATION

Cape Canaveral Air Force Station, Florida

LANDING

February 18, 2021

LANDING SITE

Jezero Crater, Mars

MISSION DURATION

At least one Mars year (about 687 Earth days)

National Aeronautics and Space Administration



Mars 2020/Perseverance

Over the past two decades, missions flown by NASA's Mars Exploration Program have shown us that Mars was once very different from the cold, dry planet it is today. Evidence discovered by landed and orbital missions point to wet conditions billions of years ago. These environments lasted long enough to potentially support the development of microbial life.

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

technology to benefit future robotic and human exploration of Mars.

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



Mission Timeline

- Launch in July-August 2020 from Cape Canaveral Air Force Station, Florida
- Launching on a ULA Atlas 541 procured under NASA's Launch Services Program
- Land 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

Key Hardware

Perseverance will carry seven instruments to conduct unprecedented science and test new technology on the Red Planet. They are:

- Mastcam-Z, an advanced camera system with panoramic and stereoscopic imaging capability with the ability to zoom. The instrument also will determine mineralogy of the Martian surface and assist with rover operations. The principal investigator is James Bell, Arizona State University in Tempe.

NASAfacts

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5 THINGS TO KNOW ABOUT THE MARS HELICOPTER INGENUITY

- 1** The first test of powered flight on another planet.
- 2** Built to be light and strong enough to stow away under the rover while on the way to Mars, and survive the harsh Martian environment after arrival. The helicopter weighs less than 4 pounds (1.8 kilograms).
- 3** Powerful enough to lift off in the thin Mars atmosphere. The atmosphere of Mars is very thin: less than 1% the density of Earth's.
- 4** The helicopter may fly for up to 90 seconds, to distances of almost 980 feet (300 meters) at a time and about 10 to 15 feet above the ground. That's no small feat compared to the first 12-second flight of the Wright Brothers' airplane.
- 5** The helicopter flies on its own, without human control. It must take off, fly and land, with minimal commands from Earth sent in advance.

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Mars Helicopter



When NASA's Mars 2020 rover lands on February 18, 2021, it will be carrying a passenger onboard: the first helicopter ever designed to fly in the thin Martian air.

The Mars Helicopter is a small, autonomous aircraft that will be carried to the surface on the Red Planet attached to the belly of the Mars 2020 rover. Its mission is experimental in nature and completely independent of the Mars 2020 science mission. In the months after landing, the helicopter will be placed on the surface to test – for the first time ever – powered flight in the thin Martian air. Its performance during these experimental test flights will help inform decisions relating to considering small helicopters for future Mars missions, where they could perform in a support role as robotic scouts, surveying terrain

from above, or as full standalone science craft carrying instrument payloads. Taking to the air would give scientists a new perspective on a region's geology and even allow them to peer into areas that are too steep or slippery to send a rover. In the distant future, they might even help astronauts explore Mars.

The project is solely a demonstration of technology; it is not designed to support the Mars 2020 mission, which is searching for signs of ancient life and collecting samples of rock and sediment in tubes for potential return to Earth by later missions.

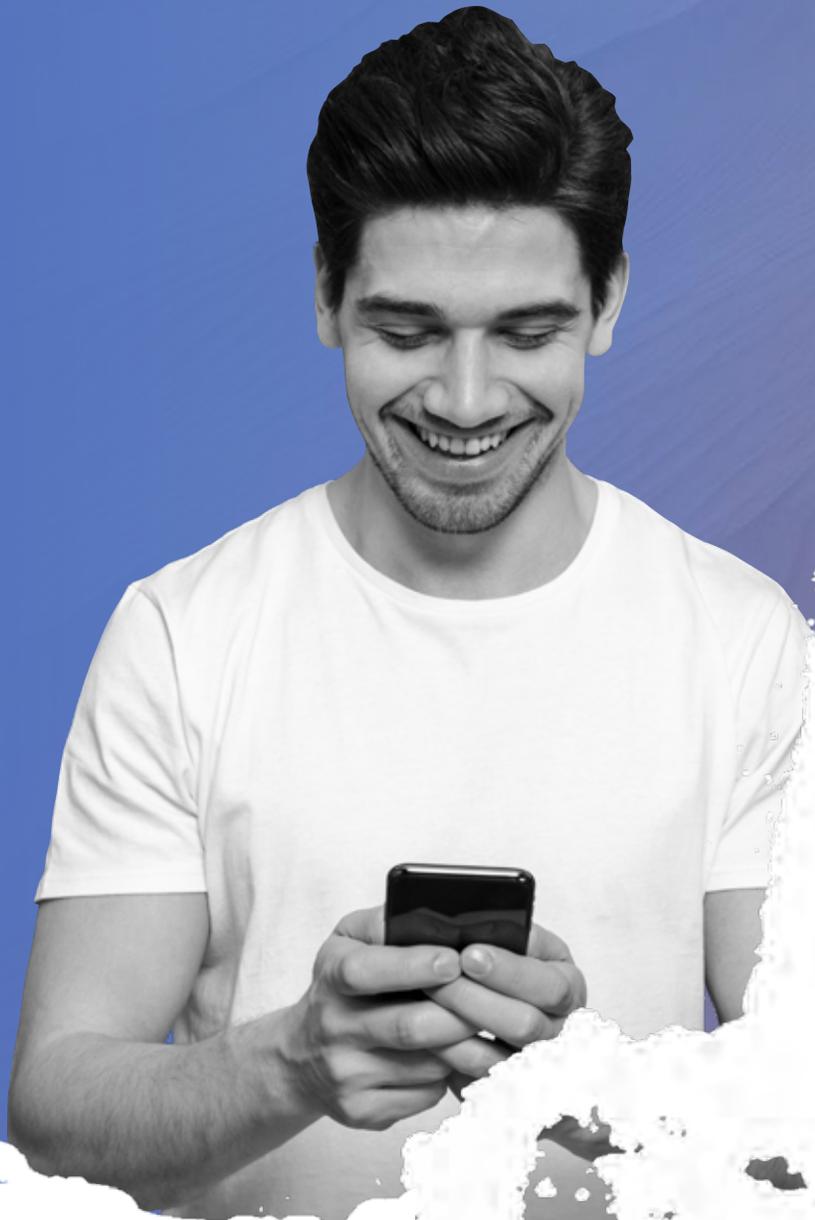
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✦ **Watch video**

#COUNTDOWN

JOIN IN THE FUN AND CREATE



WNTOMARS!

TE YOUR OWN LAUNCH VIDEOS

- 1 Record your own version of a launch countdown
- 2 Share your video on Facebook, Twitter or Instagram
- 3 Tag your post with the hashtag #CountdownToMars

✦ [Learn more](#)



