Facts behind Europe and Russia's ExoMars mission

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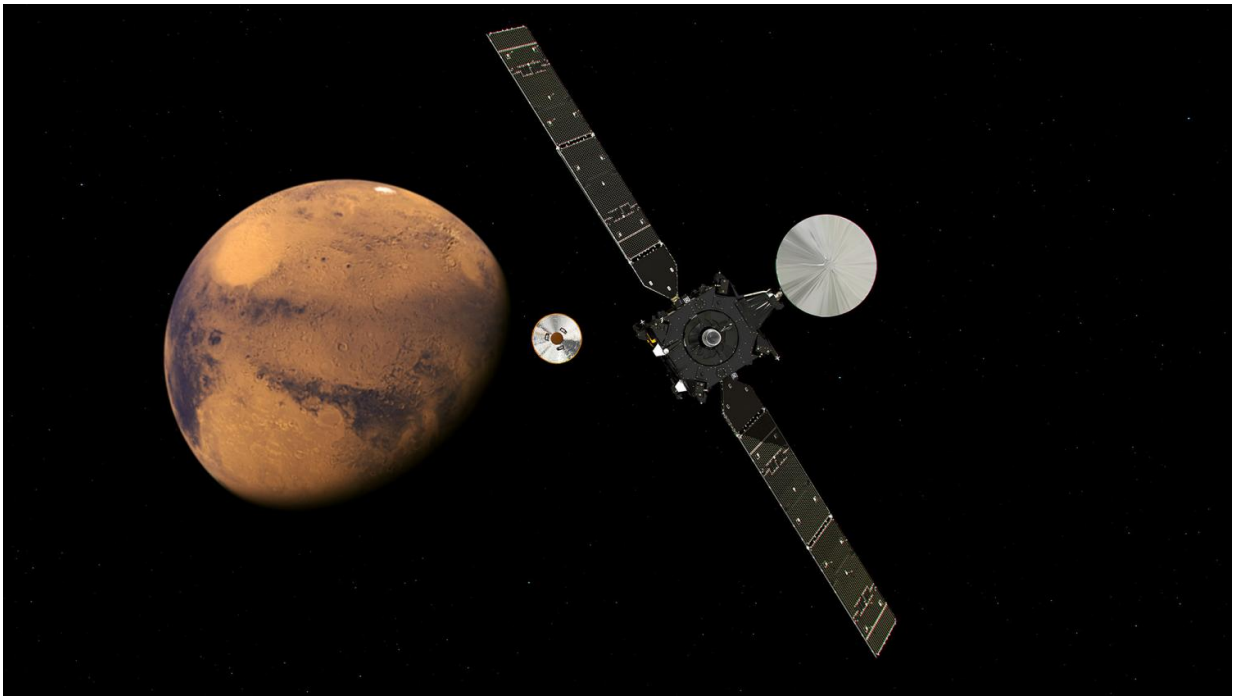

The ExoMars Trace Gas Orbiter and its entry, descent and landing demonstrator module, Schiaparelli, approaching Mars. The separation is scheduled to occur on 16 October 2016, about seven months after launch. Schiaparelli is set to enter the martian atmosphere on 19 October, while TGO will enter orbit around Mars. Credit: ESA/ATG medialab

Europe hopes to land a tiny craft on Mars Wednesday, a key step in its joint ExoMars project with Russia to search for life on the Red Planet.

A factfile on the mission:

What's in a name?

ExoMars gets its name from "exobiology"—the science of analysing the odds and likely nature of life on other planets.

Schiaparelli, the ExoMars test lander, was named after a late 19th-century Italian astronomer Giovanni Schiaparelli, who had observed straight lines, which he called "canali", on Mars through a telescope.

Many imagined these were vast networks of irrigation canals built by intelligent creatures—a notion that influenced H.G. Wells to write the early sci-fi classic, "The War of the Worlds," about Martians attacking Earth. Better telescopes in the 20th century killed off that legend.

In numbers

The ExoMars Trace Gas Orbiter (TGO) spacecraft, which will analyse the Martian atmosphere, measures 3.5 metres by two metres by two metres (11.5 feet by 6.5 feet by 6.5 feet).

It has solar wings spanning 17.5 metres, tip to tip.

With the Schiaparelli lander on board, it travelled 496 million kilometres (308 million miles) to get to Mars.

On Sunday, the TGO released Schiaparelli from a distance of one million km from the Red Planet's surface.

The lander, 1.6m wide, will test entry and landing gear for a subsequent six-wheeled rover to be launched in 2020.

Why?

Scientists believe Mars once hosted liquid water—a key ingredient for life as we know it.

While the Martian surface is too dry, cold and radiation-blasted to sustain life today, this may have been a different story three and a half billion years ago when the Red Planet's climate was warmer and wetter.

Science has long abandoned the hunt for little green men, though.

Life, if any exists, is likely underground—away from harmful ultraviolet and cosmic rays—and in the form of single-celled microbes.

Primitive or not, it would be the first time humans ever observe life on a planet other than Earth.

The mission will also seek to learn more about geological processes on Mars, and about the sand storms that change the face of the planet with their seasonal violence.

How?

TGO will taste Martian gases, looking specifically for methane.

Methane is important because it may be a clue to life—on Earth it is mostly produced by biological processes.

Previous missions had already picked up traces of methane in Mars' atmosphere, but the TGO has much more sophisticated tools with which scientists hope to tell whether the gas is biological or geological in origin.

Methane can, theoretically, also be created by underground volcanoes.

The rover will drill into Mars to look for evidence of buried, extinct life, or even live microbial activity.

Who?

While diplomatic ties between Europe and Russia may be under strain, they collaborate closely on ExoMars—a shared project of Roscosmos and the European Space Agency (ESA).

Europe has budgeted 1.3 billion euros ($1.4 billion) for the mission.

America's NASA, which was due to contribute $1.4 billion, pulled out due to budget cuts in 2012, causing Europe to turn to Russia.

Moscow agreed to provide launcher rockets in exchange for science instruments onboard the craft.

The lander, Schiaparelli, is European, and the rover will be too. The platform housing the rover and its science lab will be Russian.

SOURCE: European Space Agency (ESA), National Aeronautics and Space Administration (NASA)