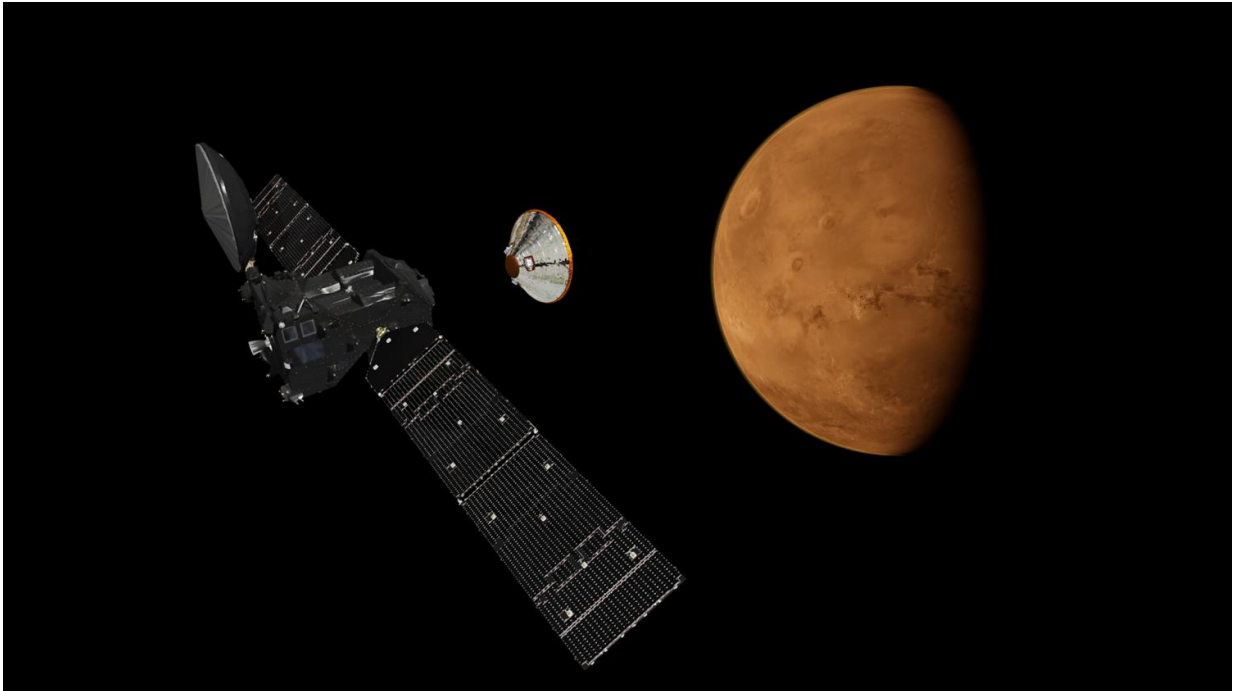


# Robot explorers all set for Mars tryst: ESA

October 18 2016

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Artist's impression depicting the separation of the ExoMars 2016 entry, descent and landing demonstrator module, named Schiaparelli, from the Trace Gas Orbiter, and heading for Mars. Credit: ESA

Europe was poised Tuesday to place a paddling pool-sized lander on Mars and a gas-sniffing craft in its orbit as part of a mission with Russia to scour the Red Planet for signs of life.

High-stakes manoeuvres Wednesday should see the Trace Gas Orbiter

(TGO) enter a gravity loop around our planetary neighbour, while a lander dubbed Schiaparelli makes a scorching, supersonic dash for its surface.

Commands for the TGO's orbit insertion were successfully uploaded on Tuesday, the European Space Agency (ESA) website said, "ready for execution".

The TGO and Schiaparelli, launched into space in March, comprise phase one of the ExoMars mission through which Europe and Russia seek to join the United States in roaming the surface of the fourth rock on the Sun.

The orbiter's job will be to sniff the Red Planet's atmosphere for gases possibly excreted by living organisms, however small or primitive.

Schiaparelli's purpose, in turn, is to test entry and landing technology for a subsequent Mars-drilling rover which will mark the second phase and high point of ExoMars.

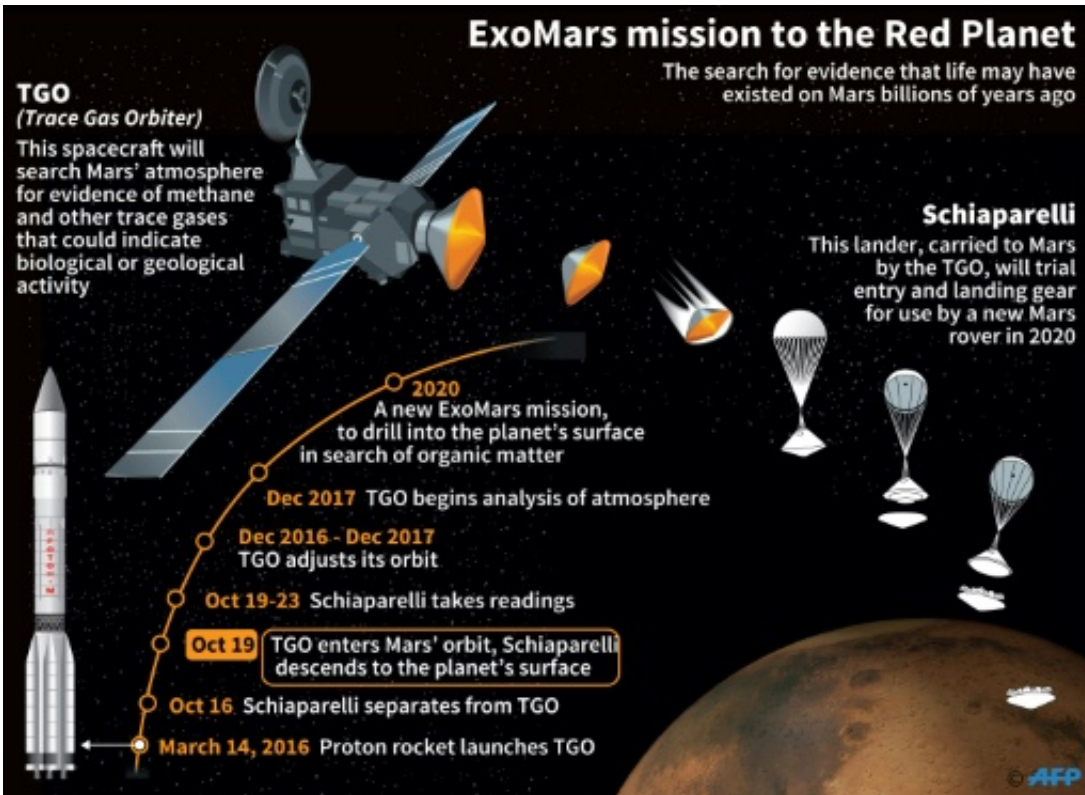
The first manoeuvre Wednesday, scheduled for 1304 GMT, will see the TGO execute its most critical command to date—initiating a 139-minute engine burn to slow down sufficiently to be captured by Mars' gravity.

Schiaparelli, meanwhile, will be executing its own daredevil mission.

The 600-kilogramme (1,300-pound) craft is scheduled to enter the atmosphere at 1442 GMT and touch down six minutes later near the Martian equator in an area known as Meridiani Planum.

With a 10-minute delay—the time it takes for a message to reach Earth—Schiaparelli will send home data on atmosphere temperature, humidity, density and electrical properties—crucial to planning a safe

landing for the bigger and more expensive rover to follow.



ExoMars mission to the Red Planet

## High-risk

Schiaparelli will test crucial heat-protection, braking and soft touchdown technology.

A discardable "aeroshell" will protect it against a scorching heat of several thousand degrees Celsius generated by atmospheric drag, while a supersonic parachute and nine thrusters will brake it.

A crushable structure in the lander's belly is meant to cushion the final

impact.

Battery-driven and without solar panels, Schiaparelli should last for two or three days.

"Many attempts to land on Mars have failed exactly because there is such a long chain" of actions to be flawlessly executed, French planetologist Francois Forget, a scientist on the ExoMars mission, told AFP.

"There cannot be a single weak link."

Since the 1960s, more than half of US, Russian and European attempts to land and operate craft on the Martian surface have failed.

ExoMars is Europe's first attempt to place a rover on the hostile Martian surface since the British-built Beagle 2 disappeared without a trace in 2003 after separating from its mothership.

It was finally spotted in a NASA photo in January 2015.

The ExoMars rover, equipped with a drill, is set for launch in 2020 after a two-year funding delay, to search for evidence of extraterrestrial life—past or present.

While any life is unlikely to be found on the barren, radiation-blasted surface, scientists say traces of methane in Mars' atmosphere may indicate there is something underground, possibly single-celled microbes.

The TGO, with its methane-sniffing equipment, will join the search for life in 2018, once it has reached an altitude of 400 kilometres.

Until then, it will be "aerobraking—skimming the atmosphere to bleed off energy and change its erratic orbital loop into a more circular one.

The TGO, with Schiaparelli on board, had travelled seven months and 496-million kilometres (308 million miles) from Earth before Sunday's separation at an altitude of a million kilometres (621,000 miles).

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