Europe, Russia embark on search for life on Mars

March 12 2016, by Mariëtte Le Roux

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Europe and Russia are set to launch an unmanned spacecraft Monday to smell Mars' atmosphere for gassy evidence that life once existed on the Red Planet, or may do so still.

ExoMars 2016, the first of a two-phase Mars exploration, will see an orbiter hoisted from Kazakhstan at 0931 GMT Monday on a Russian Proton rocket.

With its suite of high-tech instruments, the Trace Gas Orbiter or TGO, should arrive at the Red Planet on October 19 after a journey of 496 million kilometres (308 million miles).

Its main mission to photograph the Red Planet and analyse its air, the TGO will also piggyback a Mars lander dubbed Schiaparelli.

"Rocket rollout—our 2016 mission is at the launch pad!" the European Space Agency (ESA) tweeted Friday.

ExoMars is a two-step collaboration between ESA and Russia's Roscosmos space agency.

The second phase, a Mars rover due for launch in 2018, seems likely to be delayed over money worries.

But the first phase is going ahead as planned, and with high expectations: "Determining whether Mars is 'alive' today", according to an ESA document.

A key goal is to analyse methane, a gas which on Earth is created in large part by living microbes, and traces of which were observed by previous Mars missions.

Picture released by the European Space Agency shows the Russian Proton rocket that will launch the ExoMars 2016 spacecraft during its transfer to the launch pad

"TGO will be like a big nose in space," according to Jorge Vago, ExoMars project scientist.

Methane, the ESA said, is normally destroyed by ultraviolet radiation within a few hundred years, which implied that in Mars' case "it must still be produced today."

The question is: By what?

Methane can either be generated in a biological process, such as microbes decomposing organic matter, or geological ones involving chemical processes in hot liquid water under the surface.

TGO will analyse Mars' methane in more detail than any previous mission, said ESA, to try and determine its likely origin.

Picture released by the European Space Agency (ESA) shows technicians working on the final preparations on one of two ExoMars spacecraft

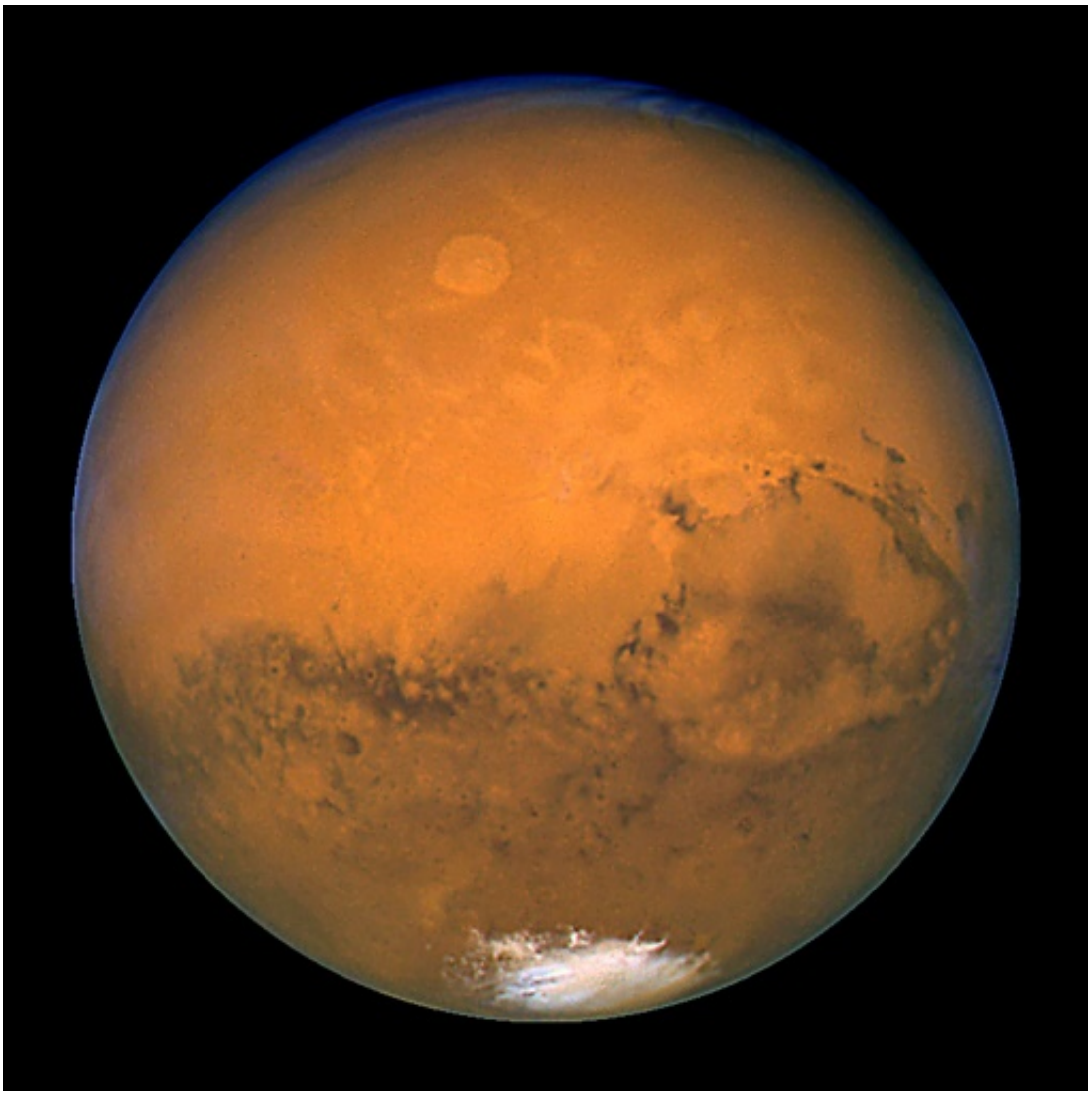
Anybody out there?

Another key element of the ExoMars 2016 mission is Schiaparelli, named after a 19th century Italian astronomer whose discovery of "canals" on Mars caused people to believe, for a while, that there was intelligent life on our neighbouring planet.

Schiaparelli is a "demonstrator" module to test heat shields and parachutes in preparation for a subsequent rover landing on Mars, a feat ESA said "remains a significant challenge".

During its few live days on the surface of Mars, Schiaparelli will also measure atmospheric particles, wind speed and temperatures.

The TGO's main science mission is scheduled to last until December 2017, but it has enough fuel to continue operations for years after, if all goes well.



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As for the next phase, ESA director general Jan Woerner has mooted a possible two-year delay, saying in January: "We need some more money" due to cost increases.

The rover has been designed to drill up to two metres (2.2 yards) into the

Red Planet in search of organic matter, a key indicator of life past or present.

Scientists widely accept that liquid water, an essential ingredient for life, once flowed on Mars.

Last September, researchers unveiled "the strongest evidence yet" the planet may still host water in the form of super-salty streaks of brine.

Today's Martian surface is considered too dry and radiation-blasted for living organisms to survive, but conditions would have been much more comfortable—warmer and wetter—some 3.5 billion years ago.

"Establishing whether life ever existed on Mars, even at a microbial level, remains one of the outstanding scientific questions of our time," said ESA, "and one that lies at the heart of the ExoMars programme".

The mission derives its name from the scientific term for the search for life beyond Earth—exobiology.

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