Europe shortlists four sites for 2019 Mars mission

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The European Space Agency (ESA) said on Wednesday it had identified four potential sites for landing a rover on Mars in 2019 in its boldest exploration yet of the Red Planet.

The landing is the second part of a two-phase endeavour called ExoMars, a project between ESA and Russia's Roscosmos space agency to look for evidence of life on Mars.

In the first step, an orbital probe will be launched in January 2016, arriving nine months later, to look for atmospheric traces of methane gas, a telltale sign of the existence of microbial life.

It will also send down a small stationary lander called Schiaparelli, designed to test technologies for the second phase—a six-wheeled rover, designed for launch in 2018 with touchdown in January 2019.

The four shortlisted sites for the 2019 landing are located in features named Mawrth Vallis, Oxia Planum, Hypanis Vallis and Aram Dorsum. All are relatively close to the planet's equator.

"The present-day surface of Mars is a hostile place for living organisms but primitive life may have gained a foothold when the climate was warmer and wetter, between 3.5 billion and four billion years ago," ExoMars project scientist Jorge Vago said in a statement.

"Therefore our landing site should be in an area with ancient rocks

where liquid water was once abundant. Our initial assessment clearly identified four landing sites that are best suited to the mission's scientific goals."

An ESA orbiter, Mars Express, has been circling the planet since December 2003.

Its achievements include high-resolution stereoscopic imaging of Mars' surface and confirmation by ground-penetrating radar that a vast cache of frozen water lurks beneath the surface at the south pole.

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