Tooling up ExoMars

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Artist's impression of the ExoMars Trace Gas Orbiter. Credits: ESA

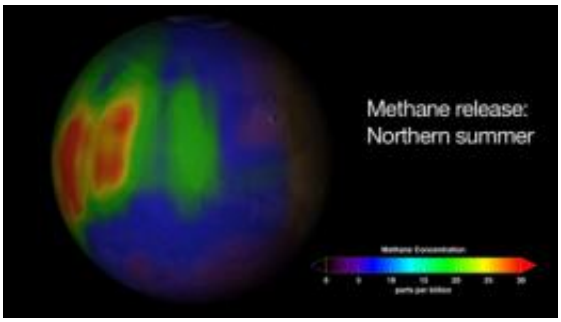
(PhysOrg.com) -- ESA and NASA are inviting scientists from across the world to propose instruments for their joint Mars mission, the ExoMars Trace Gas Orbiter. Scheduled for launch in 2016, the spacecraft will focus on understanding the rarest constituents of the martian atmosphere, including the mysterious methane that could signal life on Mars.

Establishing whether life ever existed, or is still active on Mars today, is one of the outstanding scientific quests of our time. Both missions in the ExoMars programme will address this important goal.

The first spacecraft is the Trace Gas Orbiter, which ESA will build and NASA will launch.

Today, both space agencies issued an Announcement of Opportunity inviting scientists to propose instruments to be carried on the mission. Once all proposals are in, they will be evaluated and the winning teams will be tasked with building the actual hardware.

A Joint Instrument Definition Team has identified a model payload based on current technology, but turning that blueprint into reality is now the job of the scientific community. “We are open to all instrumental proposals so long as they help us achieve our scientific objectives,” says Jorge Vago, ESA ExoMars Project Scientist.



The ExoMars Trace Gas Orbiter will map the variation of martian methane with unprecedented accuracy, helping to determine whether the methane is biologically or volcanically produced. Credits: NASA

The priority for this mission is to map trace gases in the atmosphere of Mars, distinguishing individual chemical species down to concentrations of just a few parts per billion. Of these gases, one in particular attracts special attention: methane. Discovered on Mars in 2003, it happens to be a possible ‘biomarker’, a gas that is readily produced by biological activity. Understanding whether the methane comes from life or from geological and volcanic processes takes precedence. “The methane is the anchor point around which the science is to be constructed,” says Vago.

Adding to the mystery is that methane was found to be concentrated in just three locations on Mars, and then disappeared much faster from the atmosphere than scientists were expecting. This points to an unknown destruction mechanism much more powerful than any known on Earth. It may also indicate a much faster creation process to have produced such large quantities of the gas in the first place.

Provided by European Space Agency

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