**Mars Express -10 Years in orbit.**

* May 2013

10:00:10

Mars Express, Europe’s mission to the red planet, celebrates 10 years in orbit this month. Originally only intended to be 687 days long, the equivalent of 1 Martian year, the mission has sent back such large quantities of invaluable data that it’s been extended until at least the end of 2014.

*Images – Launch of Mars Express 2003, then animations of Mars Express in orbit then Images of the surface of Mars.(“Water on Mars” 2006)*

00:30

With its 6 on-board instruments, the spacecraft has been monitoring all aspects of the Martian environment, from the subsurface to the upper atmosphere and beyond to its 2 tiny moons. This has provided an in-depth analysis of the history of the planet with some notable highlights along the way.

*Images – Animation of position of instruments (2013), then animation of Moons animation of mars express taking radar measurements , animation of Mars surface (“Water on Mars” 2006).*

00:48

One of the most important findings was the quantity of ice at the North and South Polar Regions. With its ground penetrating radar, MARSIS, Mars Express was able to measure the vertical depth of the ice down to 3.7 kilometres at the South Pole and 2km at the North Pole. This means that at the South Pole alone there is enough water locked-in to cover the entire planet with a layer of water 11metres deep. Mars Express was able to go further and determine what kind of ice it was.

*Images – animation of ice on Mars then, radar readings of Mars Express(“Water on Mars” 2006), HRSC image of ice (2004), then animations of ice on surface ending on image of Ice in a crater (“Water on Mars” 2006).*

**01:19**

**Olivier Witasse, Mars Express project scientist, ESA**

**Thanks to the specific instrumentation on-board the mission, we are able to tell us what kind of ice did we find, and the result is that there is a mix of CO2 ice or carbon dioxide ice and water ice, //one of the main objective of any mission to mars is to trace the water on mars in every form, liquid if possible, solid, water vapour, so its very important to study the ice because it’s one of the reservoirs of water on the planet.**

*Images -animation of Mars Express (“Why going to mars?”2010) , 3D models of Ice composition (2013),*

01:50

Another of the mission’s most intriguing and debated observations has been the detection of methane in the planet’s atmosphere. On earth methane is the by-product of biological or geological processes and its detection on Mars has led to an intense debate as to its potential source.

*images – animation of MEX in front of Mars, then surface (“Why going to mars?”2010) then animation of Methane molecules, then 3D model of methane over planet’s surface, then scientific meeting about presence of Methane on Mars in Italy (“The Martian methane” 2009).*

**02:08**

**Olivier Witasse, Mars Express project scientist, ESA**

**Mars Express has for the first time detected methane and also the concentration in the atmosphere vary from a place to another, from a season to another, and this discovery has been very debated in the science community because in fact methane should not be there because it’s being destroyed in the atmosphere by the ultra violet radiation .**

02:32

A possible source of the methane could be volcanic activity. Although until recently it was thought that the planet’s volcanoes, some of the largest in the universe, have been inactive for billions of years, recent images from Mars Express’s high resolution camera show something different.

*Images- animation of Methane being released from volcanoe (“The Martian methane” 2009), then HRSC HD image of Volcanoe (2011,* Credit: DLR , FU Berlin, (G.Neukum)

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**02:48**

**Olivier Witasse, Mars Express project scientist, ESA**

**some of the volcanoes are in fact very very recent, we are find some part of volcano there were recent as early as a few million years ago, which is very young in terms of geological ages. So that means that mars is maybe still active and that volcanoes can well erupt tomorrow.**

03:06

Finally, to mark the mission’s 10-year anniversary, ESA is releasing comprehensive mineralogical maps of the entire planet’s surface. These Global Maps are an invaluable tool as they show the mineral composition of any one point of the planet’s surface, which in turn makes it possible to derive the entire history of Mars from this map.

*Images – View of mars, Animation of Mars (“Why going to mars?” 2010****)*** *and Mex then 3D animation of Mars with different mineralogical mappings (2013).*

03:27

Mars Express is also paving the way for the next generation of European-led Mars exploration missions called ExoMars. Its Orbiter, due to launch in 2016, will build on the measurements of the atmosphere taken by Mars Express with a focus on determining the source of methane. Mars Express is also involved in finding the best landing place for the second stage of ExoMars, the landing Rover due to launch in 2018. Both phases of ExoMars continues the main work of Mars Express - to find out whether life has ever existed on Mars, or is still active today, Questions that have fascinated scientists and the public alike for many years.

*Images -Animation of Mex in front of Mars then planet’s surface (“Why going to mars?” 2010), then photo montage of Planet’s surface (“The Martian methane” 2009), Then ExoMars animation of Lander (“Why going to mars?” 2010).*

*04:08 End*

**B-Roll**

**Interviews Olivier Witasse, Mars Express project scientist, ESA:**

04:08 English -Discovery and composition of Polar Ice

04:56 English- Methane of Mars

05:28 English -Extending the mission

06:48 English - Mineralogical Maps

07: 17 French - Discovery and composition of Polar Ice (French)

08:13 French - Methane of Mars (French)

08:54 French - Volcanoes on Mars (French)

09:28 French - Extending the mission

10:10:15 French - Mineralogical Maps x 2

**Images:**

10: 11:36 Animations of Mars Surface x 7 (*“Water on Mars”* 2006)

10: 12:48 , HRSC Images of Surface x 8,

Credit: DLR , FU Berlin, (G.Neukum)

- photos 1,2,3 : 2004

- photo 4 : (*“Water on Mars”* 2006)

- photo 5 : 2005

- photo 6: Nicholson Crater 2005

- photo 7 :neighbouring volcanoes 2011

- photo 8 : partial view of South Pole 2004

10: 14:00 End