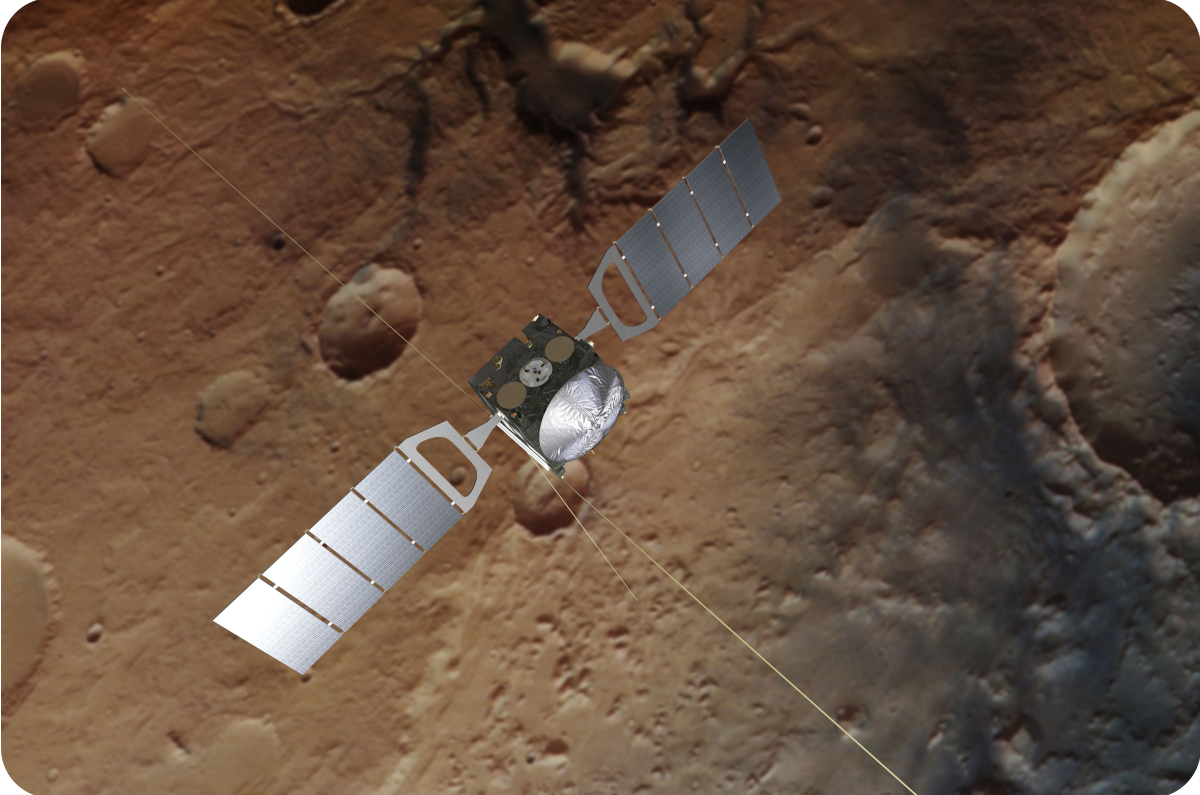


Liquid water found on Mars!



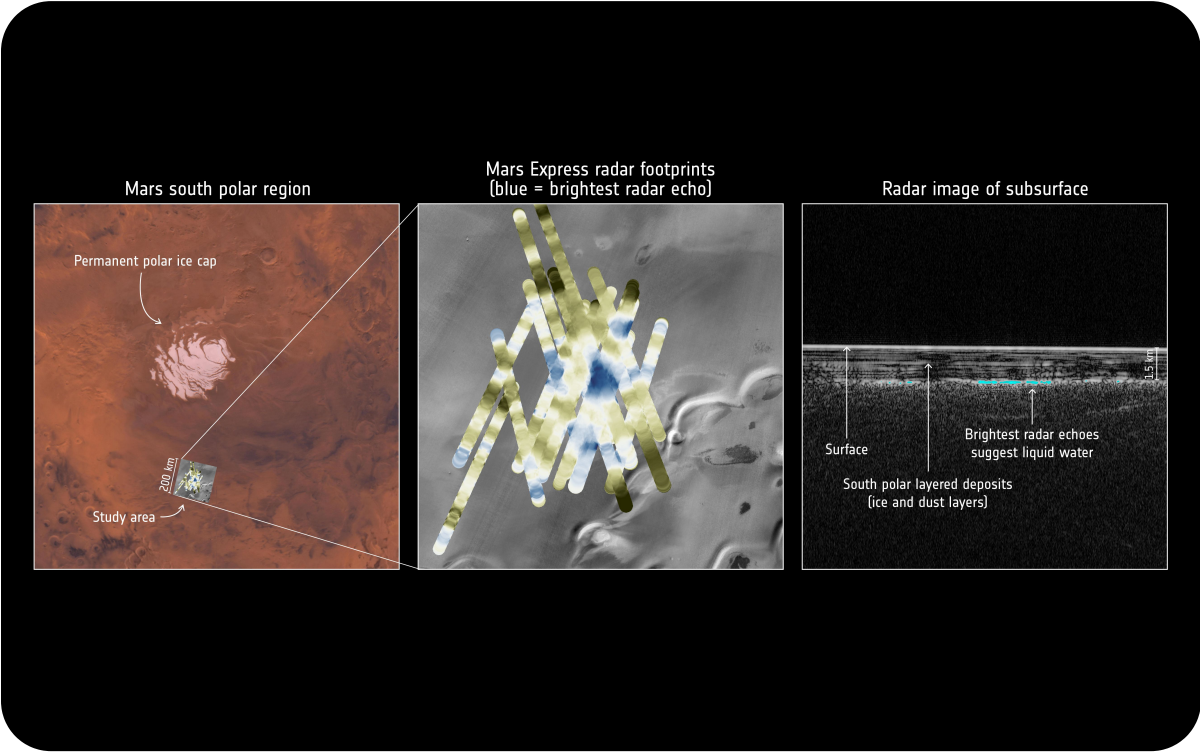
ESA's Mars Express orbiting the Red Planet

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27 August 2018

ESA's Mars Express spacecraft has made an amazing discovery: signs of liquid water on the Red Planet! Scientists have been searching for water for a long time, and this breakthrough could prove to be very important.

Long ago in its past, much of Mars' surface was covered in oceans, rivers and lakes. We know this because in our modern times we can see features such as huge dried-out river valleys across Mars. These have been photographed in fantastic detail by orbiting craft. Landers and rovers exploring the surface have also found minerals that can only form in liquid water.

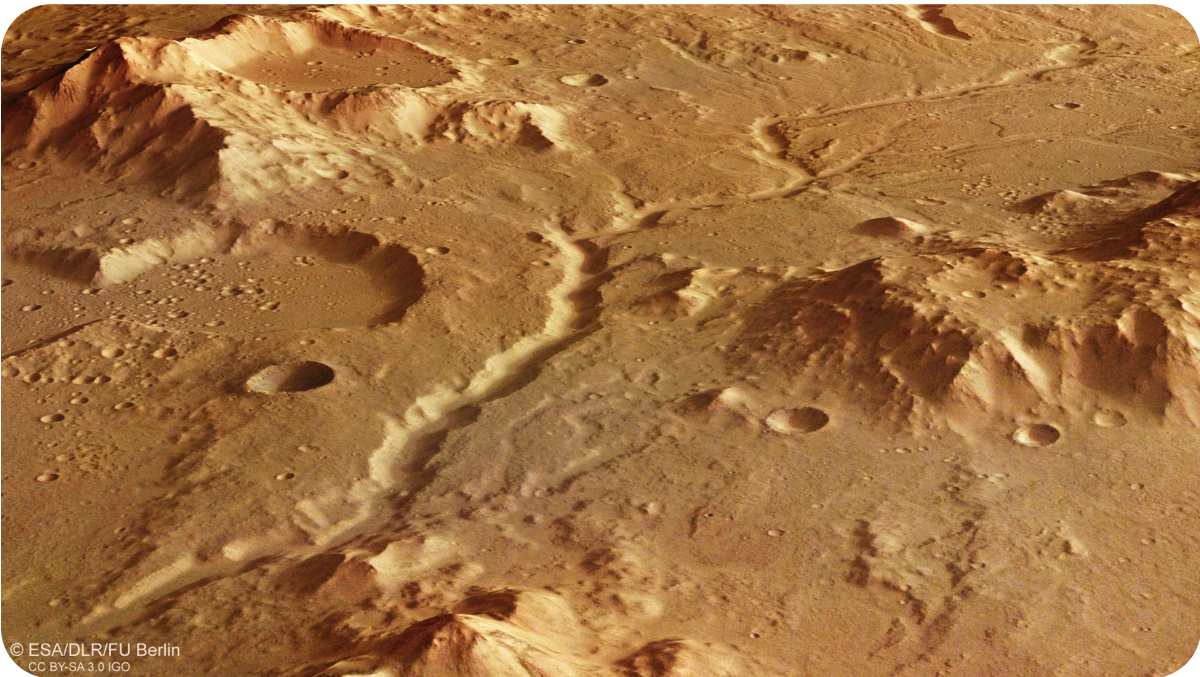


On the left is the area studied by Mars Express. The middle picture shows where the radar was searching. On the right is a side-on view showing where the water is most likely to be.

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But all this water was not to last. Mars' climate changed, and – although Mars Express has previously shown that frozen water lies at the poles of the planet – liquid water cannot exist on the surface today. So, scientists decided to look underground! They used Mars Express' special MARSIS (**M**ars **A**dvanced **R**adar for **S**ubsurface and **I**onosphere **S**ounding) instrument. MARSIS is a “ground-penetrating radar”. This means that it sends radar pulses from orbit towards the surface of Mars. By timing how long it takes the pulses to be reflected back, and how strong they are, scientists can work out what it is like beneath the ground. Clever!

An investigation using MARSIS found what scientists have been looking for. The south polar region of Mars is made from many layers of ice and dust, down to a depth of around 1.5km, in the 200 km-wide area studied. A particularly bright radar reflection, 20 km-wide, was found underneath these layered deposits. Scientists believe this to be a large pond of liquid water!



We can already see dried-up river beds on the surface, but now we know that there is liquid water underground!

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Some forms of microbial life on Earth live in pockets of water with conditions that humans would find impossible to survive, so a big question is whether any tiny creatures are swimming around in this Martian water? There could well be many more ponds and lakes under Mars' surface, just waiting to be discovered. What secrets do they contain?

Dmitri Titov, ESA's Mars Express project scientist, puts it best: “This thrilling discovery is a highlight for planetary science and will contribute to our understanding of the evolution of Mars, the history of water on our neighbour planet and its habitability.”

Would you like to investigate underground lakes on Mars? What do you think we might find there?

Cool fact: Mars Express has spent 15 years orbiting the Red Planet!