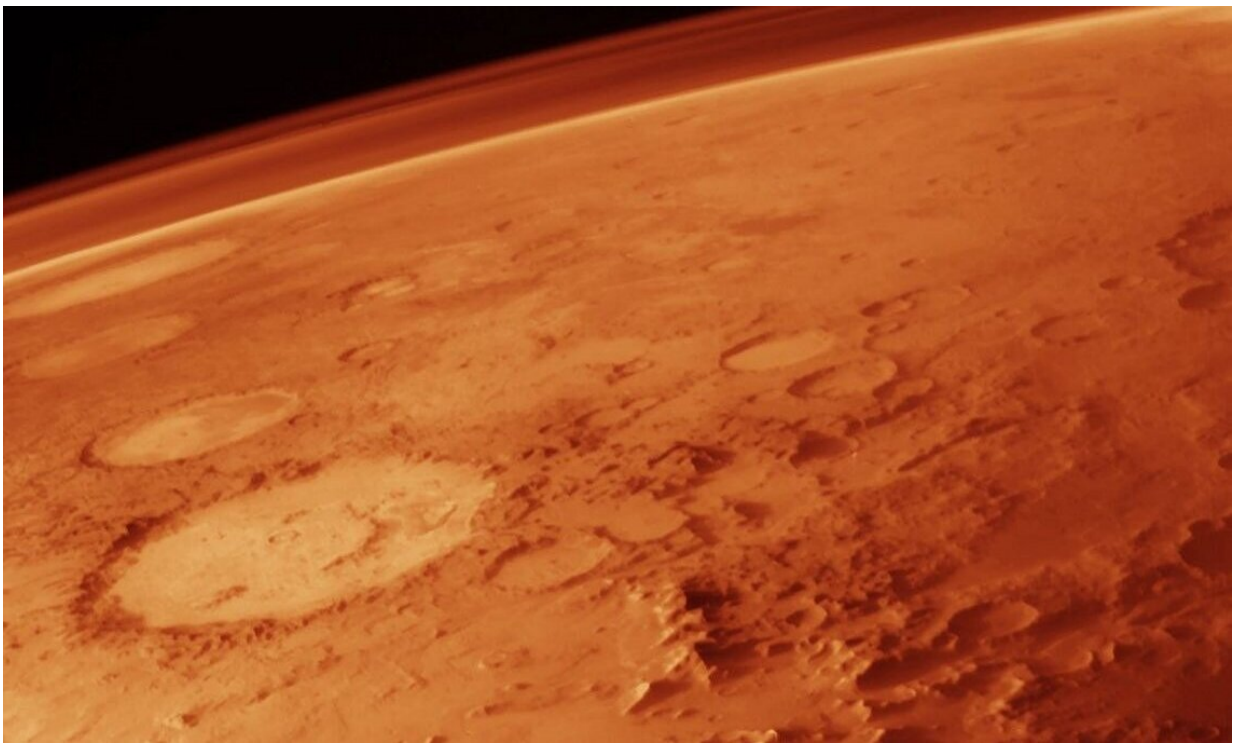


Planetary scientist suggests loss of water to space on Mars may be tied to lower atmospheric factors

December 10 2021, by Bob Yirka



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Planetary scientist Erdal Yiğit, with George Mason University, has published a Perspective piece in the journal *Science* suggesting that upper atmospheric interactions with solar wind cannot fully explain the loss of

surface water on Mars. In his paper, he suggests three other major factors need to be taken into consideration as well: gravity waves, convection and dust storms.

Planetary scientists generally agree that there used to be a lot of water on the surface of Mars, and they also agree that the [surface water](#) was slowly lost to space in the form of hydrogen over the course of billions of years. Prior research has suggested that [water molecules](#) were torn apart by sunlight in the lower Martian atmosphere, resulting in the hydrogen from the water drifting off into space. In his paper, Yiğit suggests that there is still [insufficient evidence](#) to suggest that the water loss was so straightforward.

He suggests that there were other factors at play as well, noting that recent experiments have shown that water in the Martian atmosphere could have been carried directly into the upper atmosphere, where it would have been torn apart before drifting into space. This new evidence suggests things must have been happening in the lower atmosphere to push the water into the upper atmosphere. Yiğit suggests it could have been a combination of things, such as low altitude convection currents, dust storms or gravity waves.

Yiğit begins his argument by noting that recent evidence from Mars probes shows that water is still escaping into space—and that it happens mostly during the Mars summer, when the planet also experiences global dust storms. He further suggests that such [dust storms](#) could have played a role in circulating hydrogen after it was split from oxygen molecules by solar radiation. He says that it appears likely that upward-propagating gravity waves could have played a role in pushing water upward.

Yiğit suggests that the loss of surface water on Mars cannot be fully explained without taking into consideration factors in both the upper and lower atmosphere and the vertical coupling that likely occurred between

the two.

More information: Erdal Yiğit, Martian water escape and internal waves, *Science* (2021). [DOI: 10.1126/science.abg5893](https://doi.org/10.1126/science.abg5893)

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