

COSMOS

HOW THE SCIENCE OF EVERYTHING MAKES EVERYTHING BETTER **Issue 94**



The FEEL GOOD issue



JOY DIVISION
Which creatures chortle, and why?

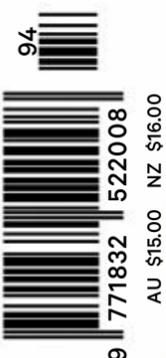
DEAD GRATEFUL
Holographic performance tech

+ GREEN DISPOSAL
A better future for death

EMBRYONIC EAVESDROPPING
How the unborn are listening in

INSIDE THE GENIUS LAIR
The underground lab hunting missing mass

Ri Aus



SPACE

***Record scratch* maybe there actually IS liquid water on Mars?**

There is, there isn't, there is, there isn't... what's the deal with liquid water on the red planet?

Grab some popcorn, because a study has recently argued that our strongest evidence for liquid water on the Mars is nothing more than a dusty mirage, shattering our most potent hope for discovering microbial life on the red planet.

The original evidence came from Italian researchers in 2018, who have now come back with a vengeance, doubling down on their conclusions that there actually is a sub-glacial liquid lake beneath Mars' south pole.

So, what's the deal? Is there liquid water on Mars or not?

Well, we know that Mars is covered in vast regions of ice, and that the planet used to host liquid water in the distant past, thanks to the impressions that rivers and oceans carved on its rocky surface billions of years ago.

But 2018 was the first time we had any strong evidence of liquid water on the planet in this day and age. The glint of possible sub-glacial water was glimpsed by the European Space Agency's Mars Express Orbiter.

The announcement fuelled hopes that we might, with a bit of focused exploration, one day find microbial life on Mars.

But in late January 2022, US researchers published a paper in *Geophysical Research Letters* that refuted the Italian team's original claims. They offered an alternate explanation for the shiny-bright signal underneath Mars' southern pole: they suggested it was a mirage caused by volcanic rock buried under the ice.

Meanwhile, the original team published a new study addressing alternate theories and

doubling down on their initial conclusion. One major remaining question was how liquid water could persist in the frigid (-73°C) temperatures assumed to occur beneath the ice cap.

The team found that a group of salts commonly found in the Martian soil have anti-freeze properties, and so there could indeed be a briny, sub-glacial lake sloshing around underneath all that ice.

Though we don't yet know where we stand, it's exciting that this scientific back-and-forth inches us closer to the truth.

"Science isn't foolproof on the first try," says Isaac Smith, a Mars geophysicist who was not involved with the studies.

"That's especially true in planetary science where we're looking at places no one's ever visited and relying on instruments that sense everything remotely."

Is there liquid water on Mars? Most likely not at Mount Sharp (below), captured in this portrait by the Curiosity rover, but Italian researchers in 2018 thought yes at the Martian south pole. Those claims were refuted by a University of Austin, US, study earlier this year.