Mars' dust devils revealed: Whirlwinds on the red planet need twice as much draft to get going than on Earth - and they could help explain Martian weather

- **On Mars, dust devils can stretch up to 12 miles (19km) above the surface**
- **They form when heating of the ground causes a warm layer of air rising through the more dense layers of air above**
- **Scientists used meteorological data with information from Viking lander**
- **They found that due to the Martian atmosphere, twice as much wind is needed to create the dust devils**
- **This could help scientists analyse how dust affects Mars' weather system**

By ELLIE ZOLFAGHARIFARD FOR MAILONLINE

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Dust devils on Mars can grow to the size of terrestrial tornadoes, with a funnel more than 330ft (100 metres) wide stretching up to 12 miles (19km) above the surface.

Their smaller counterparts on Earth form when heating of the ground causes a warm layer of air rising through the more dense layers of air above.

Now, a new study has found that it's not just their size that sets Martian dust devils apart; they also require a stronger updraft create a similar vortex than on Earth.

Spinning a dust devil in the thin air of Mars requires a stronger updraft than is needed to create a similar vortex on Earth, researchers claim. Pictured is a dust devil reaching above the plain of Mars' Amazonis Planitia

The discovery could help scientists analyse how dust affects the

Martian weather system - a piece of information that will impact deep space missions to the red planet.

'To start a dust devil on Mars you need convection, a strong updraft,' said Bryce Williams, an atmospheric science graduate student at the University of Alabama in Huntsville (UAH).

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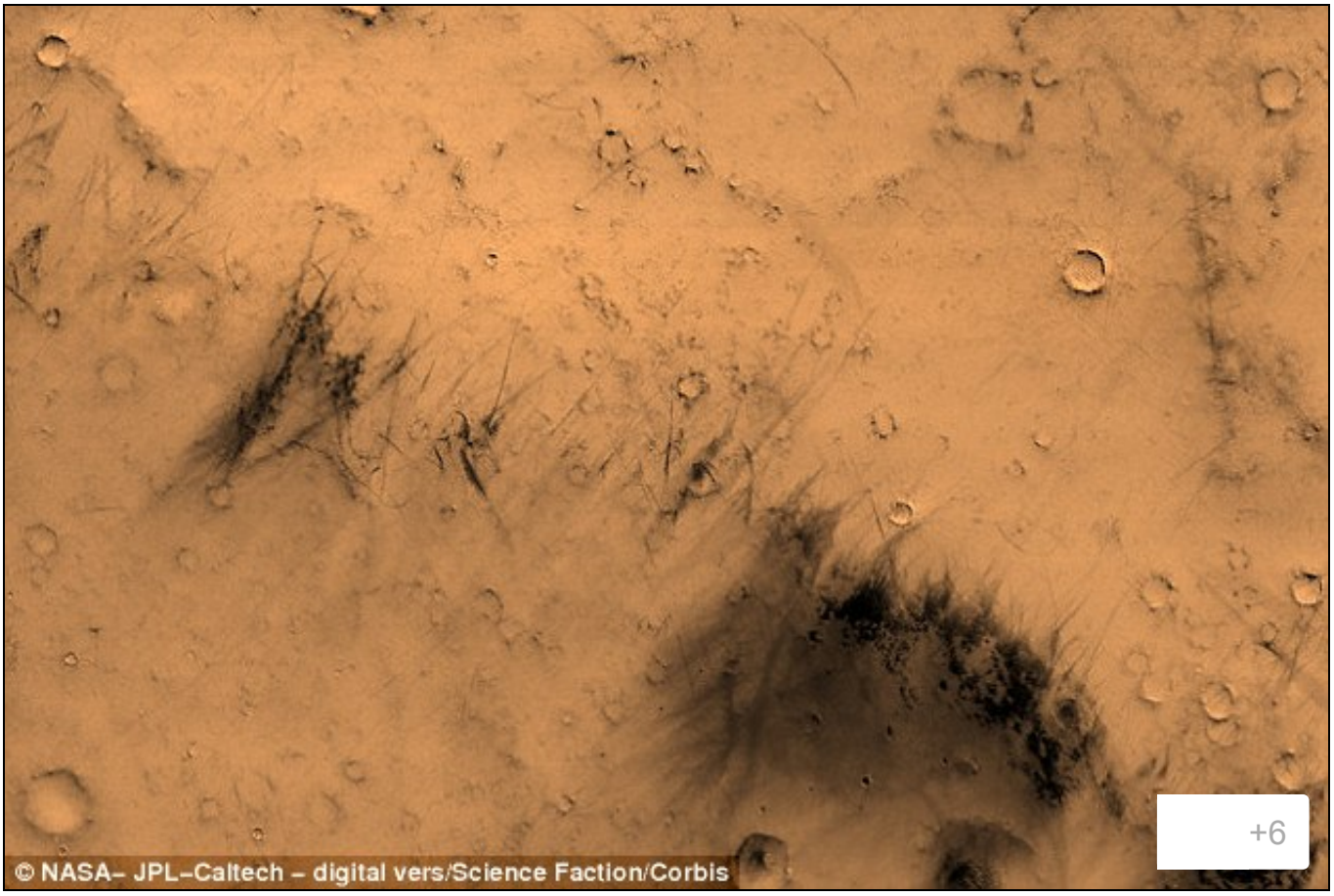
'We looked at the ratio between convection and surface turbulence to find the sweet spot where there is enough updraft to overcome the low level wind and turbulence.

'And on Mars, where we think the process that creates a vortex is more easily disrupted by frictional dissipation – turbulence and wind at the surface – you need twice as much convective updraft as you do on Earth.'

Dust devils on Mars can grow to the size of terrestrial tornadoes, with a funnel more than 330ft (100 metres)

wide stretching as much as 12 miles (19km) above the surface (left). Their smaller counterparts on Earth form when heating of the ground causes a warm layer of air rising through the more dense layers of air (right)



Dust devils and tornadoes are common on Mars. Here they have lifted the thin bright dust on the surface of the Schiaparelli Basin, exposing darker material underneath

The team looked for the dust devil sweet spot by combining data from a study of Australian dust devils with meteorological observations collected during the Viking Lander mission.

They are now looking at the effects dust devils have on lifting dust into the Martian atmosphere, and changing the planet's climate.

'The Martian air is so thin, dust has a greater effect on energy transfers in the atmosphere and on the surface than it does in Earth's thick atmosphere,' said Professor Udaysankar Nair.

Dust in the Martian air cools the surface during the day and emits long-wave radiation that warms the surface at night.

UNEXPLAINED METHANE 'BURPS' SUGGEST BACTERIA IS LIVING ON MARS

Nasa scientists in California have revealed evidence that suggests there is life on Mars based on readings taken by the Curiosity rover (shown). They said methane spikes on the planet could be produced by bacteria. And at the moment there is no alternative explanation for the spikes

In the past few months, conclusive evidence has been found that Mars once had water on its surface, but one greater question remains: Was there, or is there still, life on Mars as well?

Scientists may be on the brink of answering that question with an equally conclusive 'yes', as convincing evidence has been detected by Nasa's Curiosity rover.

An instrument on the rover identified spikes of methane that scientists believe may have come from bacteria-like organisms on the surface - and it could be the first alien life ever detected.

'This temporary increase in methane - sharply up and then back down - tells us there must be some relatively localiSed source,' said Sushil Atreya of the University of Michigan, Ann Arbor, and Curiosity rover science team.

'There are many possible sources, biological or non-biological, such as interaction of water and rock.'

Previous satellite observations have detected unusual plumes of methane on the planet.

But none of these previous readings are as extraordinary as the sudden 'venting' measured at Gale Crater, where evidence suggests water once flowed billions of years ago.

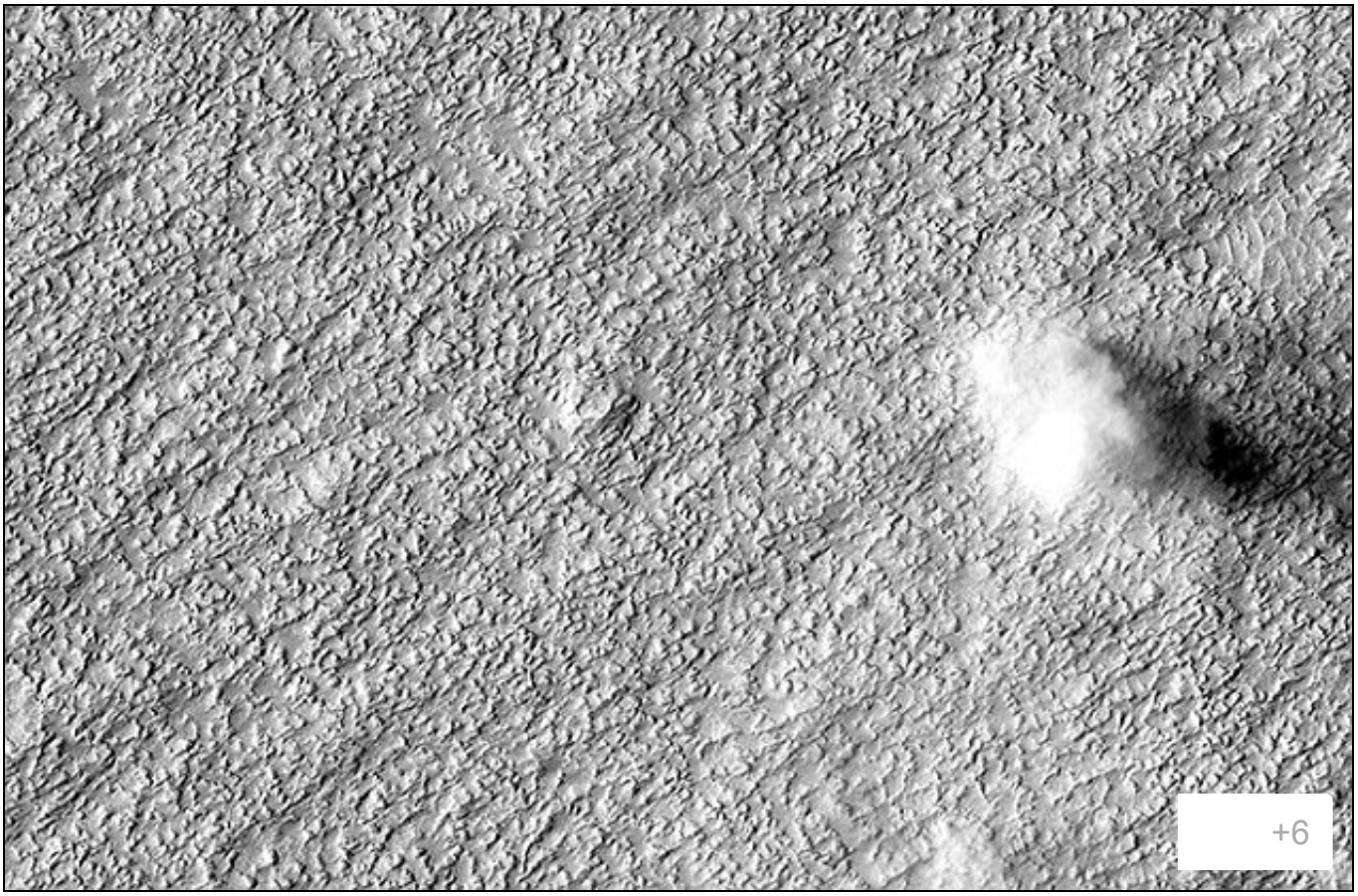
While spotting dust devil tracks is relatively common, catching these whirling dervishes on the Martian surface can be tough.

Earlier this year, observations from the High-Resolution Imaging

Science Experiment (HiRISE) camera on board Nasa's Mars Reconnaissance Orbiter caught three dust devils in action.

Despite their reputation, they can actually help solar panelled robots on the Martian surface.

For instance, the Mars Rover Opportunity underwent a 'cleaning event' this year, when a dust devil blew off material stuck to its surface.



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