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Space

Could we make Mars habitable using clouds of metallic glitter?

Alex Wilkins

RELEASING glitter-sized metal rods into Mars's atmosphere could warm the planet enough to melt water and support microbial life.

Making the surface of the Red Planet suitable for Earth life, a process called terraforming, would be complex, but a crucial part of this is raising its surface temperature above its current frosty median level of -65°C (-85°F).

Some people have suggested installing mirrors above Mars's surface or pumping methane into its atmosphere, but these ideas are difficult to implement because the raw materials required would need to be sent from Earth.

Now, Edwin Kite at the University of Chicago in Illinois and his colleagues have found that relatively small dust clouds made from iron or aluminium rods mined from rocks on Mars could warm the planet by about 30°C (54°F) in a period of a few months or over a decade, depending on how quickly the particles are released.

These rods would each be about 9 micrometres long and 160 nanometres across. They could

be carried by wind from the surface to the Red Planet's upper atmosphere, where they would then remain for around a decade, trapping heat from below and allowing sunlight through.

Kite and his team modelled how the rods responded to light and then fed this information into climate simulations, which showed that the increase in temperature and pressure would be enough for

Terraforming Mars would make it more like Earth

parts of Mars to sustain liquid water and potentially oxygen-producing bacteria (*Science Advances*, doi.org/nb5h).

They also found that this warming would only need the rods to be released at a rate equivalent to water flowing through about 30 garden sprinklers, amounting to a total of 700,000 cubic metres of metal per year to achieve the required warming, or around 1 per cent of Earth's metal production.

"When we did the calculation, we found a surprisingly small

amount of engineered dust would be required, much less than if you wanted the same amount of warming with engineered greenhouse gases," says Kite.

Although it would still be challenging to mine from Mars's surface, this technique is 5000 times more efficient than any previously suggested warming method, says Kite.

One uncertainty in the simulations is how the tiny rods might interact with water in Mars's atmosphere, which could cause unintended effects like water clumping around the dust and falling back to the surface as rain, reducing the warming.

It is an interesting idea and might work if the particles stay in the atmosphere long enough, says Manoj Joshi at the University of East Anglia, UK. But it would still involve a huge manufacturing effort, he says.

There are also ethical questions about whether we should do this to Mars's atmosphere, says Joshi. "Should we really be altering a planet in this manner?" ■



DETLEV VAN RAVENSWAAY/SCIENCE PHOTO LIBRARY

Psychology

Many conspiracy theorists may not be real believers

LOTS of people who say in surveys that they believe conspiracy theories probably don't think they are actually true. This means attempts to assess the prevalence of these beliefs could be skewed.

Robert Ross at Macquarie University in Sydney and his colleagues have surveyed 1044 adults from Australia, who they contacted via market research company YouGov. They asked the

respondents, who had an average age of 48, to rate seven conspiracy theories, marking them as either "definitely false", "probably false", "don't know", "probably true" or "definitely true". These included "the idea of man-made global warming is a hoax that was invented to deceive people".

Initially, 349 of the participants were considered conspiracy theorists because they said they believed at least one of the theories was probably or definitely true.

The team then used two methods to gauge if they were being sincere. First, one of the seven theories was

"farically bizarre", says Ross: "The Canadian Armed Forces have been secretly developing an elite army of genetically engineered, super intelligent, giant raccoons to invade nearby countries." If a participant said this was probably or definitely true, they were considered an "insincere responder".

Second, the researchers asked if the participants had answered any of the questions "randomly

"Our question about giant raccoons was much more effective for identifying insincere responders"

or insincerely". If they answered "yes", then they were also marked as insincere. Overall, 205 of the participants were considered to be insincere (PsyArXiv, doi.org/nb5g).

"Our question about giant raccoons was much more effective for identifying insincere responders than our direct question about responding insincerely," says Ross.

"Researchers need to remember that surveys are far from a perfect reflection into what's really going on inside people's minds," says Matt Williams at Massey University in New Zealand. ■

Conor Feehly