Transcript: NASA's Dr. Lori Glaze Debunks Mars Myths

Dr. Lori Glaze takes a look at some common myths we've all heard about the weather and meteorology, and parses out which are fact, and which are pure fiction.

Released on 01/28/2021

TRANSCRIPT
[mysterious music]

We call Mars the Red Planet because the soil

that we can see there is actually very iron rich.

And so basically it rusted.

So just like rust on Earth looks red,

the soil on Mars looks red because it's rusty.

[dynamic music]

I'm Dr. Lori Glaze, and I'm the director

of NASA's Planetary Science Division.

I oversee all of the planetary science missions

that go to visit all of the planets in the solar system.

And I'm here to debunk some myths about Mars.

There's life on Mars.

The conditions on Mars are probably

not good for having life there right now.

We do know that in the past that Mars was warmer,

and wetter, and maybe there was a time

when early single-celled microbes could've started

to take hold in that Martian environment.

What's much more plausible is that

there may have been, billions of years ago,

maybe single-celled organisms, microorganisms.

Maybe some of those fossils are preserved.

We're now at a point where we think we have

enough information to help guide us to the right location

and to put the right instruments on a mission

to help us actually look for biomarkers,

the chemical evidence of what might be

the remnants of life in the past.

And the Perseverance Rover is built just for that.

The Perseverance Rover is carrying drills

and the ability to take samples of that rock

and soil in Jezero Crater.

And then store those samples on the surface

so that we can go back to Mars,

and actually collect those samples,

and bring 'em back to Earth.

We can then use our full expertise

and our full laboratory capabilities

to look at those samples and look to see

if there might actually be any kind of

fossil evidence that's been preserved,

in those samples from Jezero Crater.

If life did exist on Mars 4 billion years ago

this is exactly the kind of environment

where we would expect to find it.

If you go back and look at some of the oldest evidence

of life on Earth, it's found in very similar environments.

There's one in the Pilbara area of Australia.

And so if we bring back a sample

and it doesn't include that fossil evidence

that might be some pretty good indicator that maybe,

maybe it never did exist on Mars.

Are we all Martians?

So there has been some ideas out there

that potentially maybe life took hold on Mars.

And then there was an impact that released these rocks

that escaped from Mars' gravitational pull,

and they came to Earth as meteorites.

And then they crashed onto Earth

carrying these life-bearing molecules from Mars.

And maybe that was the seed for life on Earth.

Interesting hypothesis.

There's a lot of things that have to happen

in order for that to actually be a possibility.

Not only did there have to be the microbial life,

or some type of life on Mars,

that was present in those rocks,

they had to survive the impact.

Then they had to survive for maybe even

millions of years of travel from Mars to Earth.

They would have to survive the entry

into Earth's atmosphere.

And then they would have to land

in just the right spot on Earth

that had all the right conditions.

It's theoretically possible, but it's actually really hard.

The more likely scenario is that

the asteroids in our solar system have water molecules,

they also have organic molecules.

It's more likely that those impacted both Mars,

and Earth, and the other bodies in the solar system,

bringing the water molecules,

and bringing those organic building blocks to the surface.

And that life started to take form

in the very high temperature, water rich,

nutrient rich environments on Earth.

Pieces of Mars have been found on Earth.

So we actually have found pieces of Mars

right here on Earth as meteorites.

These meteorites are found

at a bunch of different locations on Earth.

They got kicked off of Mars

probably when there was a large impact.

Most of the meteorites we find come from asteroids.

And the asteroids are probably

about the same age as our solar system,

about four and a half billion years old.

But these meteorites that we found

that we think are from Mars are much, much younger,

about 1.3 billion to maybe a few hundred million years old.

And so they can't have come from the asteroids.

They need to have come from someplace

that has a much younger surface.

And the gases that we find trapped

in these meteorites match exactly that Mars atmosphere.

So that's what's led us to believe

that these are actually pieces of Mars here on Earth.

Mars experiences dust storms.

Mars does experience dust storms.

In fact, it experiences dust storms of all different sizes.

So we see Martian dust storms

that get depicted in the movies.

They're just these torrential winds

and it looks like something like a hurricane on Earth.

It just really wouldn't be that way on Mars.

There's just not enough atmosphere

for there to be winds that are that strong.

Some of the dust storms are small little twisters

that come sweeping across the surface of the planet.

And then about every three Martian years

these dust storms, for some reasons we don't

fully understand yet, they can get huge.

To the point that they encircle the entire globe of Mars

and block so much light that we can't even see

the surface of Mars through all of that dust.

In the spring and summer of 2018,

between about May and July,

we saw one of these big dust storms start to grow.

It was blocking out the sunlight for one of our rovers

on the surface of Mars, the Opportunity Rover,

which is powered by solar rays.

And eventually, we believe that the Opportunity

didn't have enough power to stay warm,

and probably froze on the surface.

So we believe that these dust storms are caused

as the atmosphere starts to warm up in the summer.

We can estimate that they're probably

moving at about 60 miles an hour.

Keep in mind that that seems pretty fast, 60 miles an hour,

but the dust is very, very fine-grained.

And because the density of the atmosphere is so low,

the atmosphere is so thin,

if you were standing there it would feel more like a puff.

We were beginning to think that Mars was a cold,

and dry, and desolate place, but it's actually very active.

And the dust storms are just one really good example

of that dynamic environment that's present on Mars.

Mars doesn't have seasons.

Mars also has seasons, just like Earth,

only they're twice as long as we have here on Earth.

And that's because, similar to Earth, Mars is also tilted.

The difference is that Mars is further out

from the sun than we are.

And so it takes much longer for it

to make its trip all the way around the sun.

And so therefore its seasons are gonna last

much longer than Earth's seasons.

So Mars has always had seasons,

but the tilt of Mars' axis has changed over time.

So when it's more straight up and down

you have less impact of the seasons.

And when it's more tilted

you get a stronger impact of the seasons.

So the temperatures on Mars can vary pretty extreme.

Without having an atmosphere there to hold in

any kind of thermal energy from day to night,

or from season to season, the temperatures can range

from about minus 280 degrees Fahrenheit,

up to as high as over 80 degrees Fahrenheit.

Mars has a really dynamic carbon dioxide cycle.

And so there are at both caps of Mars,

North Pole and the South Pole, are these ice caps

that are made up of carbon dioxide ice.

It will go from solid to vapor,

and then it gets transported around Mars,

and then redeposited in the northern winter.

And that cycle repeats over, and over, and over again

between winter and summer.

So really interesting carbon dioxide cycle on Mars.

And Mars continues to be a incredibly

interesting place to study, scientifically.

Everybody needs to stay tuned

because the Perseverance Rover is going to be

landing on Mars on February 18th.

So make sure you're paying attention and watch.

It's gonna be incredibly exciting as we land,

and we descend down into Jezero Crater.

[upbeat music]