

**MARS
TAKES A**

BREATH

WITH JEN EIGENBRODE



GRAVITY ASSIST



1

00:00:00,160 --> 00:00:07,440

Does Mars have the ingredients for life? Well,\h
let's find out from the latest observations from\h\h

2

00:00:07,440 --> 00:00:14,000

our Curiosity rover. Hi, I'm Jim Green, Chief\h
Scientist at NASA and this is Gravity Assist.\h\h

3

00:00:14,880 --> 00:00:18,400

On this season of Gravity Assist,\h
we're looking for life beyond Earth.\h

4

00:00:20,240 --> 00:00:25,680

I'm here with Dr. Jen Eigenbrode and she\h
is an astrobiologist at NASA's Goddard\h\h

5

00:00:25,680 --> 00:00:32,960

Space Flight Center, specializing in organic\h
chemistry, geology, and potential biology of\h\h

6

00:00:32,960 --> 00:00:39,680

Mars, and ocean environments. So today,\h
we're going to concentrate on what we know\h\h

7

00:00:39,680 --> 00:00:46,480

about the potential for life on the planet\h
Mars. Welcome, Jen to Gravity Assist.\h

8

00:00:47,280 --> 00:00:52,240

Thanks for having me, Jim. Happy to be here.
Well, you know, you're part of a fabulous\h\h

9

00:00:52,240 --> 00:00:57,840

team working on a spectacular instrument\h
on the Mars Curiosity rover called SAM,\h\h

10

00:00:57,840 --> 00:01:03,760

which is the Sample Analysis at Mars instrument.
Well, why are you so interested in the organic\h\h

11

00:01:03,760 --> 00:01:08,000

molecules, what about them
is that connection to life?

12

00:01:08,000 --> 00:01:15,120

When we look up at the red planet, it's red,
it looks like it's just rusty. And we found

13

00:01:15,120 --> 00:01:20,160

out so far is not really rusty, it's just dust
on the surface that's like that. And underneath,

14

00:01:20,160 --> 00:01:25,360

it's actually darker gray in a lot of
places. And that darker gray tells us

15

00:01:25,360 --> 00:01:29,680

there's a different chemistry that's been
preserved. When we started this mission,

16

00:01:29,680 --> 00:01:35,040

there were a lot of scientists who really doubt we
were going to find any organic molecules at all.

17

00:01:35,680 --> 00:01:41,040

And it was because we thought the
planet was rather quiet, not doing much

18

00:01:42,000 --> 00:01:48,000

old and rusty. But we're actually finding things.
And that means that if we're finding organic

19

00:01:48,000 --> 00:01:55,280

molecules in 3 billion year old rocks, that
they have been preserved over that time period.

20

00:01:56,400 --> 00:02:01,520

So the question is, do those organic molecules
tell us anything about whether life was there

21
00:02:01,520 --> 00:02:07,760
or not? Certain types of organic molecules\h
or collections of molecules are considered\h\h

22
00:02:07,760 --> 00:02:13,520
signatures of life, meaning, they're most likely\h
to be formed by life rather than other processes.\h\h

23
00:02:14,320 --> 00:02:20,400
Sorting through those and making sure that it's a\h
life process versus a non-life process is kind of\h\h

24
00:02:20,400 --> 00:02:26,320
challenging at times. But when there's evidence\h
of life, in our Earth sample, usually you find\h\h

25
00:02:26,320 --> 00:02:32,640
multiple lines of evidence for that life. The\h
fact that we found organic material in these\h\h

26
00:02:32,640 --> 00:02:38,240
ancient lake sediments, tells us that if we look\h
in the right place, perhaps we're going to find\h\h