



1
00:00:07,400 --> 00:00:04,700
this in a sense is kind of a holy grail

2
00:00:09,950 --> 00:00:07,410
for us we're in the outback of Australia

3
00:00:11,509 --> 00:00:09,960
because this is some of the oldest

4
00:00:13,850 --> 00:00:11,519
convincing evidence for life on Earth

5
00:00:15,560 --> 00:00:13,860
and the Mars 2020 mission and the

6
00:00:18,560 --> 00:00:15,570
ExoMars mission are going to be looking

7
00:00:21,349 --> 00:00:18,570
for signs of life in the ancient past on

8
00:00:23,210 --> 00:00:21,359
Mars and it was a great opportunity to

9
00:00:25,460 --> 00:00:23,220
bring the mission teams here to really

10
00:00:26,839 --> 00:00:25,470
see for themselves what we're talking

11
00:00:29,960 --> 00:00:26,849
about when we're talking about ancient

12
00:00:31,279 --> 00:00:29,970
bio signatures this part of Western

13
00:00:33,290 --> 00:00:31,289

Australia called the Pilbara

14

00:00:35,209 --> 00:00:33,300

specifically it's really absolutely a

15

00:00:36,860 --> 00:00:35,219

mecca for understanding the record of

16

00:00:38,030 --> 00:00:36,870

life on Earth this is one of the most

17

00:00:40,520 --> 00:00:38,040

important places on the planet

18

00:00:42,290 --> 00:00:40,530

geologically speaking members of the

19

00:00:43,580 --> 00:00:42,300

science team came out here to look at

20

00:00:45,139 --> 00:00:43,590

some of the oldest rocks that are on

21

00:00:46,430 --> 00:00:45,149

earth these rocks are anywhere from

22

00:00:47,630 --> 00:00:46,440

two-and-a-half to three-and-a-half

23

00:00:49,369 --> 00:00:47,640

billion years old

24

00:00:51,080 --> 00:00:49,379

about the same age as the rock so we're

25

00:00:52,729 --> 00:00:51,090

gonna find on Mars and what's very

26
00:00:55,340 --> 00:00:52,739
special about them is they have evidence

27
00:00:57,619 --> 00:00:55,350
of the earliest life on Earth the rocks

28
00:00:59,750 --> 00:00:57,629
you see right in front of me here these

29
00:01:01,819 --> 00:00:59,760
wrinkly layered structures that we call

30
00:01:04,250 --> 00:01:01,829
stromatolites structures like this

31
00:01:07,130 --> 00:01:04,260
actually represent fossilized microbial

32
00:01:09,440 --> 00:01:07,140
mats and microbial mat is actually a

33
00:01:12,010 --> 00:01:09,450
structure preserved in the rock made by

34
00:01:14,990 --> 00:01:12,020
communities of millions and millions of

35
00:01:17,990 --> 00:01:15,000
microorganisms basically fossilized pond

36
00:01:20,149 --> 00:01:18,000
scum in a sense microbes bacteria living

37
00:01:22,130 --> 00:01:20,159
in a shallow water environment and we

38
00:01:24,530 --> 00:01:22,140

believe that if life ever existed on

39

00:01:26,660 --> 00:01:24,540

Mars it would have been purely microbial

40

00:01:29,179 --> 00:01:26,670

and those are left behind in the record

41

00:01:31,490 --> 00:01:29,189

that are very distinct and so we've been

42

00:01:34,340 --> 00:01:31,500

showing the NASA and European Space

43

00:01:36,890 --> 00:01:34,350

Agency scientists the details of what

44

00:01:38,870 --> 00:01:36,900

those textures look like when we say

45

00:01:41,330 --> 00:01:38,880

with Mars 2020 we're seeking the signs

46

00:01:43,670 --> 00:01:41,340

of of ancient life on Mars this is

47

00:01:46,789 --> 00:01:43,680

precisely the kinds of signs of life

48

00:01:49,789 --> 00:01:46,799

that we'll be seeking I learned to be

49

00:01:52,789 --> 00:01:49,799

kind of a Martian to be in a harsh

50

00:01:55,520 --> 00:01:52,799

environment my comfort zone is the

51
00:01:57,649 --> 00:01:55,530
laboratory but you know here I can see

52
00:02:00,170 --> 00:01:57,659
that this is the real stuff it's not

53
00:02:03,260 --> 00:02:00,180
just simulating stuff in the laboratory

54
00:02:04,969 --> 00:02:03,270
this is a real good training for us it

55
00:02:07,010 --> 00:02:04,979
was really important to get the science

56
00:02:09,589 --> 00:02:07,020
team out here and speaking for myself I

57
00:02:11,570 --> 00:02:09,599
had seen pictures of rocks like this and

58
00:02:13,760 --> 00:02:11,580
they didn't really convince me that

59
00:02:15,800 --> 00:02:13,770
they were the product of life and when

60
00:02:18,080 --> 00:02:15,810
you see them up close and personal it

61
00:02:19,790 --> 00:02:18,090
really tells the story that this was

62
00:02:21,440 --> 00:02:19,800
once life and that's something you just

63
00:02:24,290 --> 00:02:21,450

can't get if you don't go out and look

64

00:02:25,670 --> 00:02:24,300

at rocks like this you can study it you

65

00:02:27,350 --> 00:02:25,680

can read about it but there's nothing

66

00:02:30,080 --> 00:02:27,360

like the practical experience of

67

00:02:32,990 --> 00:02:30,090

trekking around in the desert and really

68

00:02:35,300 --> 00:02:33,000

trying to think about as we land our

69

00:02:37,790 --> 00:02:35,310

Mars rovers there and we look at the

70

00:02:40,640 --> 00:02:37,800

images provided by our sensors how do we

71

00:02:42,620 --> 00:02:40,650

interpret that and follow the clues to

72

00:02:44,210 --> 00:02:42,630

try to find the kind of evidence that

73

00:02:47,120 --> 00:02:44,220

has been unearthed here in Australia

74

00:02:50,240 --> 00:02:47,130

could Mars ever have supported life and

75

00:02:51,260 --> 00:02:50,250

then to take the next step did Mars ever

76

00:02:53,540 --> 00:02:51,270

host life