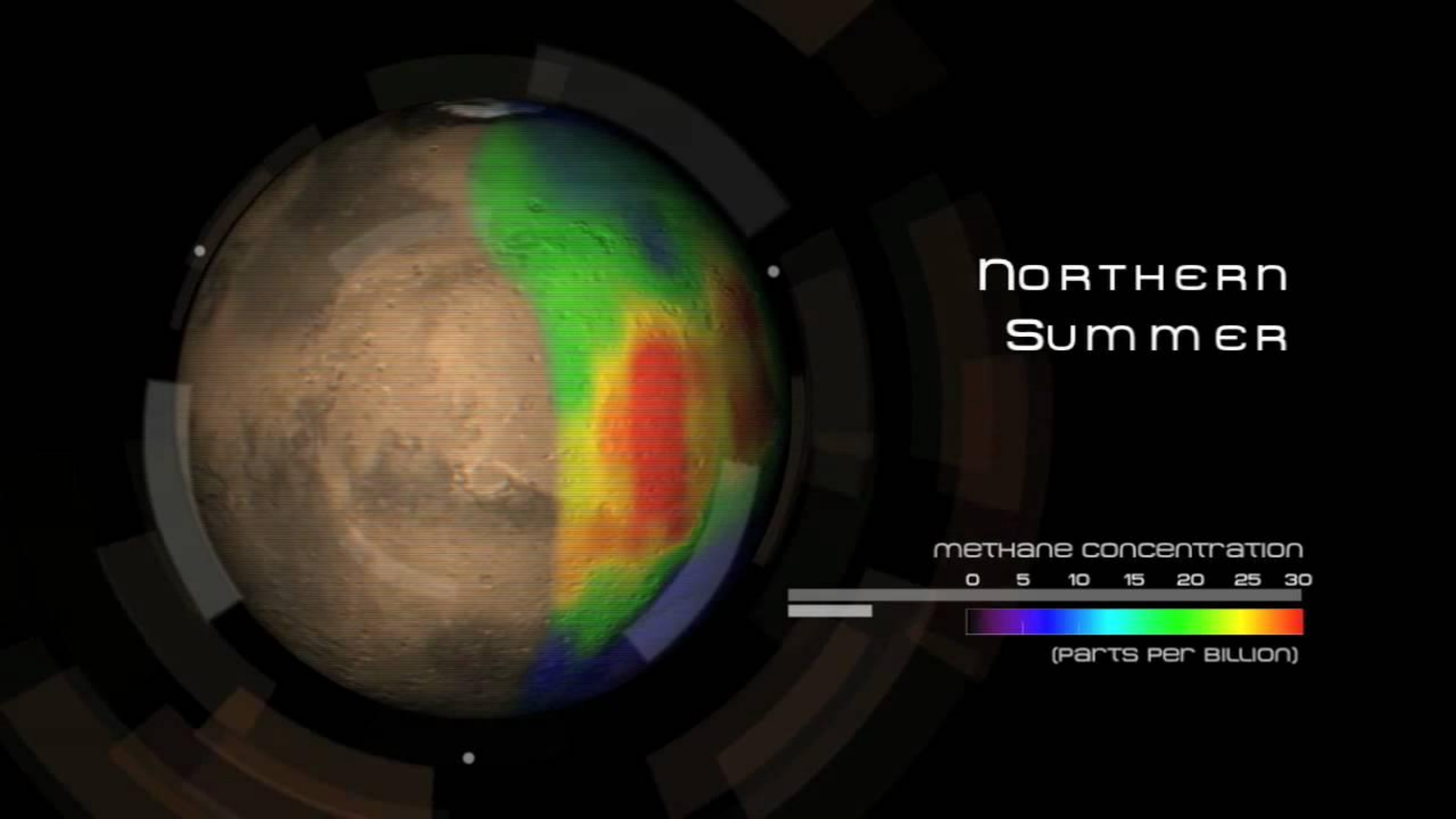
Northern
Summer
methane concentration
0 5 10 15 20 25 30
(parts per billion)

1
00:00:00,000 --> 00:00:05,809
you

2
00:00:11,549 --> 00:00:09,600
my name is Michael Mumma I work at the

3
00:00:12,510 --> 00:00:11,559
Goddard Space Flight Center for the

4
00:00:15,119 --> 00:00:12,520
National Aeronautics and Space

5
00:00:18,259 --> 00:00:15,129
Administration in Greenbelt Maryland

6
00:00:20,970 --> 00:00:18,269
our team has discovered methane on Mars

7
00:00:24,120 --> 00:00:20,980
the surprising thing about methane on

8
00:00:26,759 --> 00:00:24,130
Mars is that first that we detect it

9
00:00:28,319 --> 00:00:26,769
meaning its recently generated but in

10
00:00:30,659 --> 00:00:28,329
addition we find that it's being

11
00:00:33,090 --> 00:00:30,669
released from several discrete vents or

12
00:00:35,520 --> 00:00:33,100
sites on the planet's surface

13
00:00:37,290 --> 00:00:35,530

in either midsummer in the northern

14
00:00:40,920 --> 00:00:37,300
hemisphere or early spring in the

15
00:00:43,619 --> 00:00:40,930
southern hemisphere on Mars and yet at a

16
00:00:47,910 --> 00:00:43,629
later season we see essentially no

17
00:00:50,160 --> 00:00:47,920
methane the big question is what is the

18
00:00:52,860 --> 00:00:50,170
origin of this methane and now being

19
00:00:55,650 --> 00:00:52,870
released the two principal areas are

20
00:00:57,810 --> 00:00:55,660
first by analogy with the earth it could

21
00:01:00,540 --> 00:00:57,820
be released and produced initially

22
00:01:03,689 --> 00:01:00,550
primarily by biology this would be

23
00:01:05,970 --> 00:01:03,699
microbial activity acting on certain

24
00:01:09,240 --> 00:01:05,980
chemicals below the surface and then

25
00:01:10,860 --> 00:01:09,250
producing methane as a by-product but of

26
00:01:15,180 --> 00:01:10,870
course we can't state with certitude

27
00:01:18,360 --> 00:01:15,190
that it is biologically produced and so

28
00:01:21,510 --> 00:01:18,370
we also consider do chemical mechanisms

29
00:01:23,460 --> 00:01:21,520
in which carbon dioxide is actually

30
00:01:25,410 --> 00:01:23,470
combining with water

31
00:01:27,360 --> 00:01:25,420
and producing methane under very high

32
00:01:29,010 --> 00:01:27,370
temperatures and pressures and that

33
00:01:32,100 --> 00:01:29,020
methane can then be released in the

34
00:01:34,800 --> 00:01:32,110
atmosphere separately one of the most

35
00:01:37,730 --> 00:01:34,810
important consequences of our

36
00:01:41,340 --> 00:01:37,740
discoveries is that we've identified

37
00:01:43,950 --> 00:01:41,350
certain signposts on Mars that basically

38
00:01:47,190 --> 00:01:43,960

are like little flags that say come here

39
00:01:50,040 --> 00:01:47,200
Here I am nASA has several missions

40
00:01:52,170 --> 00:01:50,050
along these lines one is called the Mars

41
00:01:55,260 --> 00:01:52,180
Science Laboratory one of the key

42
00:01:58,590 --> 00:01:55,270
objectives is to understand whether life

43
00:02:00,950 --> 00:01:58,600
ever arose on Mars by sampling the

44
00:02:03,350 --> 00:02:00,960
material on the surface and then eval

45
00:02:05,270 --> 00:02:03,360
waiting that in terms of its origins you

46
00:02:07,070 --> 00:02:05,280
can then can appreciate that if you go

47
00:02:09,410 --> 00:02:07,080
to this right location you may in fact