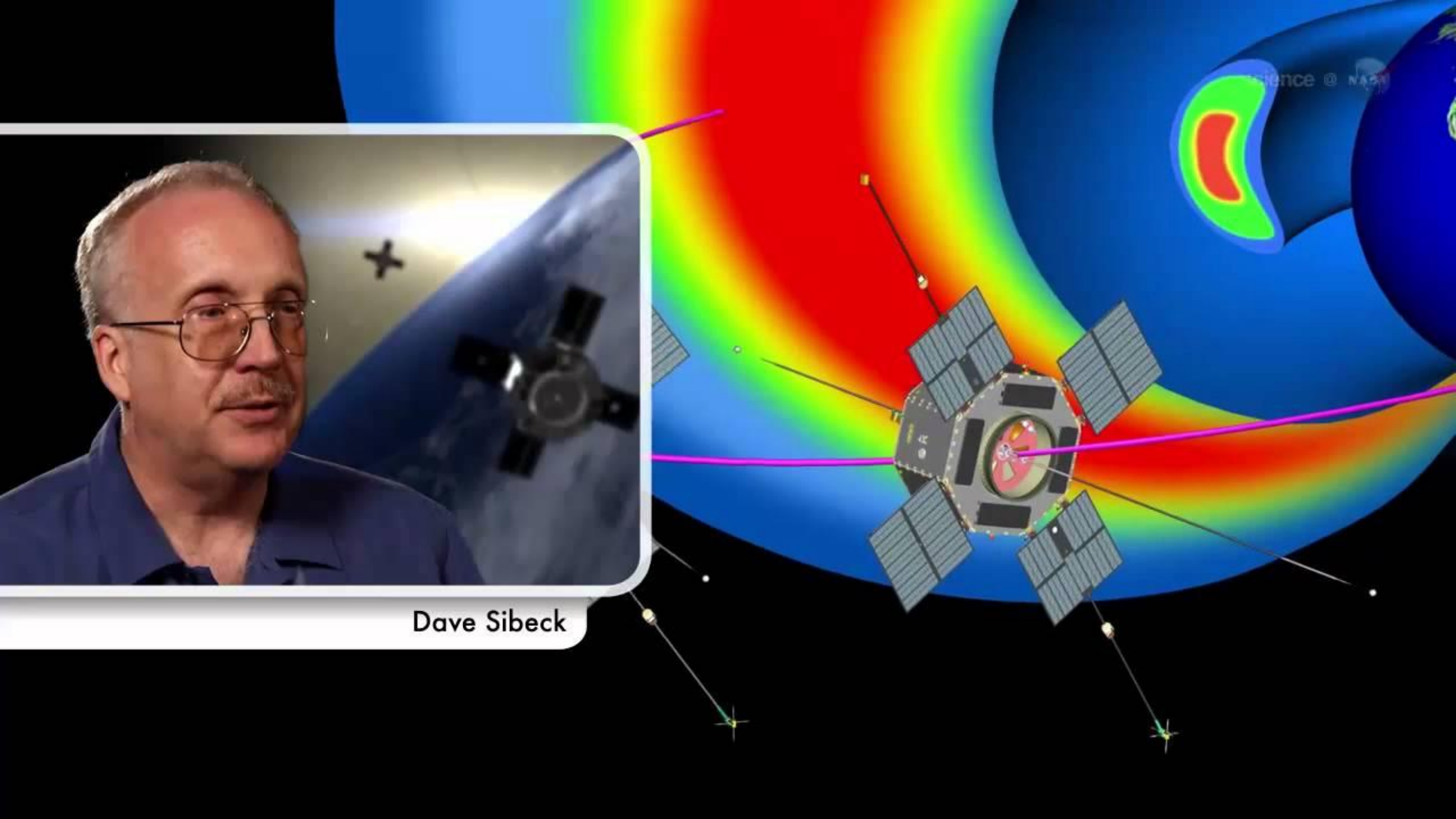
Dave Sibeck

1
00:00:09,350 --> 00:00:07,269
the sound of earth song presented by

2
00:00:12,070 --> 00:00:09,360
science at nasa

3
00:00:13,110 --> 00:00:12,080
in space they say no one can hear you

4
00:00:15,190 --> 00:00:13,120
scream

5
00:00:18,550 --> 00:00:15,200
nobody ever said anything about singing

6
00:00:21,349 --> 00:00:18,560
though a nasa spacecraft has just beamed

7
00:00:22,630 --> 00:00:21,359
back a beautiful song sung by our own

8
00:00:24,710 --> 00:00:22,640
planet

9
00:00:27,189 --> 00:00:24,720
it's called chorus explains craig

10
00:00:29,269 --> 00:00:27,199
kletzing of the university of iowa this

11
00:00:43,110 --> 00:00:29,279
is one of the clearest examples we've

12
00:00:47,510 --> 00:00:46,069
nasa's twin radiation belt storm probes

13
00:00:50,389 --> 00:00:47,520

are traveling through the region of

14
00:00:53,990 --> 00:00:50,399
space where chorus actually comes from

15
00:00:55,750 --> 00:00:54,000
and the recordings are out of this world

16
00:00:57,910 --> 00:00:55,760
this is what the radiation belts would

17
00:01:00,389 --> 00:00:57,920
sound like to a human being if we had

18
00:01:02,549 --> 00:01:00,399
radio antennas for years says kletzing

19
00:01:04,229 --> 00:01:02,559
whose team at the university of iowa

20
00:01:06,390 --> 00:01:04,239
built the emphasis

21
00:01:09,190 --> 00:01:06,400
electric and magnetic field instrument

22
00:01:27,350 --> 00:01:09,200
suite and integrated science receiver

23
00:01:31,030 --> 00:01:29,109
he's careful to point out that these are

24
00:01:33,190 --> 00:01:31,040
not acoustic waves of the kind that

25
00:01:35,270 --> 00:01:33,200
travel through the air of our planet

26
00:01:37,350 --> 00:01:35,280
chorus is made of radio waves that

27
00:01:40,550 --> 00:01:37,360
oscillate at acoustic frequencies

28
00:01:42,310 --> 00:01:40,560
between 0 and 10 kilohertz the long

29
00:01:44,710 --> 00:01:42,320
antennas of the radiation belt storm

30
00:01:46,950 --> 00:01:44,720
probes are perfect for detecting these

31
00:01:48,710 --> 00:01:46,960
kinds of waves

32
00:01:50,230 --> 00:01:48,720
chorus emissions are front and center

33
00:01:52,230 --> 00:01:50,240
for the storm probe mission says

34
00:01:54,310 --> 00:01:52,240
kletzing they are thought to be one of

35
00:01:56,310 --> 00:01:54,320
the most important waves for energizing

36
00:01:58,149 --> 00:01:56,320
the electrons that make up the outer

37
00:02:00,230 --> 00:01:58,159
radiation belt

38
00:02:02,069 --> 00:02:00,240

in particular chorus might be

39
00:02:03,510 --> 00:02:02,079
responsible for so-called killer

40
00:02:05,350 --> 00:02:03,520
electrons

41
00:02:08,550 --> 00:02:05,360
high energy particles that can endanger

42
00:02:10,150 --> 00:02:08,560
both satellites and astronauts most

43
00:02:12,390 --> 00:02:10,160
electrons in the radiation belts are

44
00:02:15,270 --> 00:02:12,400
harmless with too little energy to do

45
00:02:17,510 --> 00:02:15,280
damage to human or electronic systems

46
00:02:20,229 --> 00:02:17,520
but sometimes these electrons catch a

47
00:02:22,470 --> 00:02:20,239
chorus wave like a surfer riding a wave

48
00:02:24,150 --> 00:02:22,480
on earth and gain enough energy to

49
00:02:26,229 --> 00:02:24,160
become dangerous

50
00:02:28,869 --> 00:02:26,239
the radiation belt storm probes are on a

51
00:02:30,790 --> 00:02:28,879
mission to find out for sure

52
00:02:33,190 --> 00:02:30,800
the production of killer electrons is a

53
00:02:35,589 --> 00:02:33,200
matter of much debate and chorus waves

54
00:02:38,790 --> 00:02:35,599
are only one possibility note storm

55
00:02:41,509 --> 00:02:38,800
probe's mission scientist dave cybeck

56
00:02:43,990 --> 00:02:41,519
launched in august 2012 the two probes

57
00:02:46,630 --> 00:02:44,000
are orbiting inside the radiation belts

58
00:02:48,790 --> 00:02:46,640
sampling electromagnetic fields counting

59
00:02:50,869 --> 00:02:48,800
the number of energetic particles and

60
00:02:52,309 --> 00:02:50,879
listening to plasma waves of many

61
00:02:54,390 --> 00:02:52,319
frequencies

62
00:02:57,750 --> 00:02:54,400
we hope to gather enough data to solve

63
00:02:59,910 --> 00:02:57,760

the mystery once and for all says cybeck

64
00:03:01,990 --> 00:02:59,920
at the moment the spacecraft are still

65
00:03:04,869 --> 00:03:02,000
undergoing their 60-day checkout phase

66
00:03:07,830 --> 00:03:04,879
before the main mission begins so far

67
00:03:09,589 --> 00:03:07,840
things are checking out very well

68
00:03:11,270 --> 00:03:09,599
one of the things we noticed right away

69
00:03:13,670 --> 00:03:11,280
is how clear the chorus sounds in the

70
00:03:16,229 --> 00:03:13,680
recording notes cletzing that's because

71
00:03:18,710 --> 00:03:16,239
our data is sampled at 16 bits the same

72
00:03:21,030 --> 00:03:18,720
as a cd which has not been done before

73
00:03:23,430 --> 00:03:21,040
in the radiation belts this makes the

74
00:03:26,949 --> 00:03:23,440
data very high quality and shows that

75
00:03:29,030 --> 00:03:26,959
our instrument is very very healthy

76
00:03:31,430 --> 00:03:29,040
eventually klutzing hopes to release

77
00:03:33,990 --> 00:03:31,440
unprecedented stereo recordings of

78
00:03:36,630 --> 00:03:34,000
earth's chorus we have two spacecraft

79
00:03:38,630 --> 00:03:36,640
with two receivers he says so a stereo

80
00:03:40,309 --> 00:03:38,640
recording is possible

81
00:03:42,869 --> 00:03:40,319
such a recording would not only sound

82
00:03:43,990 --> 00:03:42,879
wonderful but also have real scientific

83
00:03:45,750 --> 00:03:44,000
value

84
00:03:47,990 --> 00:03:45,760
one of the things we don't know is how

85
00:03:49,030 --> 00:03:48,000
broad the region is over which chorus

86
00:03:51,270 --> 00:03:49,040
occurs

87
00:03:53,030 --> 00:03:51,280
the widely separated stereo capability

88
00:03:55,750 --> 00:03:53,040

of the storm probes will give us the

89
00:03:57,350 --> 00:03:55,760
ability to figure this out he explains

90
00:03:59,990 --> 00:03:57,360
with a two-year mission planned for the

91
00:04:01,990 --> 00:04:00,000
storm probes the earth song is just

92
00:04:04,070 --> 00:04:02,000
getting started

93
00:04:05,030 --> 00:04:04,080
for more weird and wonderful sounds from