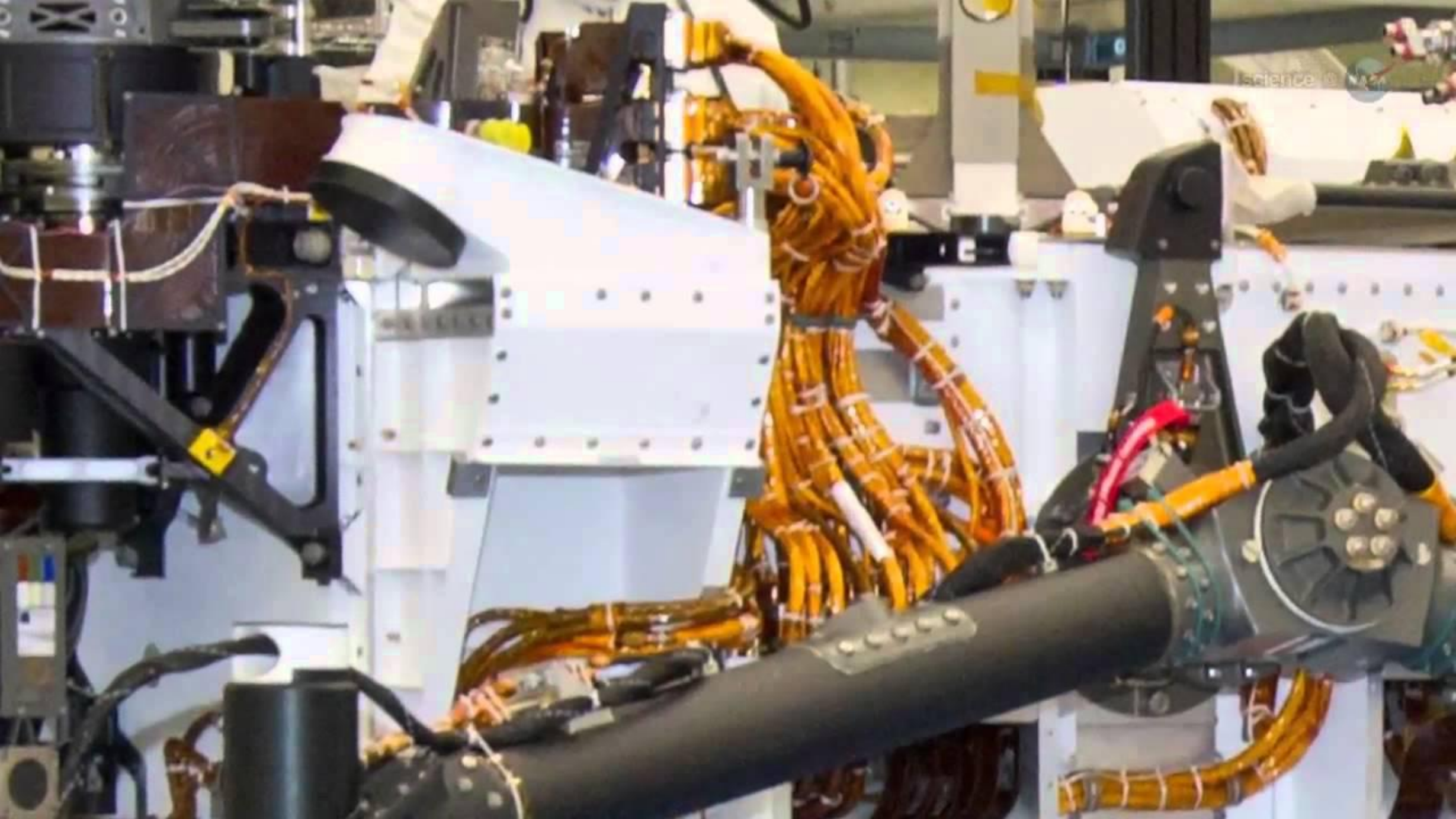

1
00:00:09,350 --> 00:00:07,590
curiosity the stunt double presented by

2
00:00:11,350 --> 00:00:09,360
science at nasa

3
00:00:13,430 --> 00:00:11,360
with a pair of bug eyes swiveling on a

4
00:00:15,910 --> 00:00:13,440
stalk nearly eight feet off the ground

5
00:00:18,390 --> 00:00:15,920
the six-wheeled 1800 pound mars rover

6
00:00:21,429 --> 00:00:18,400
curiosity doesn't look much like a human

7
00:00:23,349 --> 00:00:21,439
being yet right now the rover is playing

8
00:00:25,589 --> 00:00:23,359
the role of stunt double for nasa

9
00:00:27,109 --> 00:00:25,599
astronauts and making an excellent

10
00:00:29,029 --> 00:00:27,119
impression

11
00:00:30,950 --> 00:00:29,039
curiosity is riding to mars in the belly

12
00:00:33,830 --> 00:00:30,960
of a spacecraft where an astronaut would

13
00:00:36,709 --> 00:00:33,840

be explains don hassler of the southwest

14
00:00:38,950 --> 00:00:36,719
research institute in boulder colorado

15
00:00:41,110 --> 00:00:38,960
this means the rover experiences deep

16
00:00:43,750 --> 00:00:41,120
space radiation storms in the same way

17
00:00:47,270 --> 00:00:43,760
that a real astronaut would indeed on

18
00:00:49,190 --> 00:00:47,280
january 27 2012 curiosity's spacecraft

19
00:00:52,150 --> 00:00:49,200
was hit by the most intense solar

20
00:00:55,510 --> 00:00:52,160
radiation storm since 2005. the event

21
00:00:58,150 --> 00:00:55,520
began when sunspot ar 1402 produced an

22
00:01:00,310 --> 00:00:58,160
x2 class solar flare on the scale of

23
00:01:01,750 --> 00:01:00,320
solar flares x-flares are the most

24
00:01:03,910 --> 00:01:01,760
powerful kind

25
00:01:05,910 --> 00:01:03,920
the explosion accelerated a fuselage of

26
00:01:06,789 --> 00:01:05,920
protons and electrons to nearly light

27
00:01:08,630 --> 00:01:06,799
speed

28
00:01:11,510 --> 00:01:08,640
these sub-atomic bullets were guided by

29
00:01:13,750 --> 00:01:11,520
the sun's magnetic field almost directly

30
00:01:15,350 --> 00:01:13,760
toward curiosity

31
00:01:17,429 --> 00:01:15,360
when the particles hit the outer walls

32
00:01:19,109 --> 00:01:17,439
of the spacecraft they shattered other

33
00:01:21,590 --> 00:01:19,119
atoms and molecules in their path

34
00:01:23,749 --> 00:01:21,600
producing a secondary spray of radiation

35
00:01:25,190 --> 00:01:23,759
that curiosity both absorbed and

36
00:01:27,749 --> 00:01:25,200
measured

37
00:01:29,670 --> 00:01:27,759
curiosity was in no danger says hassler

38
00:01:31,830 --> 00:01:29,680

in fact we intended all along for the

39
00:01:33,350 --> 00:01:31,840
rover to experience these storms enroute

40
00:01:36,149 --> 00:01:33,360
to mars

41
00:01:37,749 --> 00:01:36,159
unlike previous mars rovers curiosity is

42
00:01:38,870 --> 00:01:37,759
equipped with a radiation assessment

43
00:01:41,350 --> 00:01:38,880
detector

44
00:01:43,749 --> 00:01:41,360
the instrument nicknamed rad counts

45
00:01:45,510 --> 00:01:43,759
cosmic rays neutrons protons and other

46
00:01:48,310 --> 00:01:45,520
particles over a wide range of

47
00:01:50,310 --> 00:01:48,320
biologically interesting energies

48
00:01:52,069 --> 00:01:50,320
rad's prime mission is to investigate

49
00:01:54,870 --> 00:01:52,079
the radiation environment on the surface

50
00:01:56,870 --> 00:01:54,880
of mars but researchers have turned it

51
00:01:59,990 --> 00:01:56,880
on early so that it can also probe the

52
00:02:01,670 --> 00:02:00,000
radiation environment on the way to mars

53
00:02:04,230 --> 00:02:01,680
curiosity's location inside the

54
00:02:05,590 --> 00:02:04,240
spacecraft is key to the experiment

55
00:02:07,670 --> 00:02:05,600
we have a pretty good idea what the

56
00:02:09,350 --> 00:02:07,680
radiation environment is like outside

57
00:02:10,949 --> 00:02:09,360
says hassler who is the principal

58
00:02:13,030 --> 00:02:10,959
investigator for rad

59
00:02:15,510 --> 00:02:13,040
inside the spacecraft however is still a

60
00:02:17,430 --> 00:02:15,520
mystery even supercomputers have trouble

61
00:02:19,589 --> 00:02:17,440
calculating exactly what happens when

62
00:02:21,350 --> 00:02:19,599
high-energy cosmic rays and solar

63
00:02:22,470 --> 00:02:21,360

energetic particles hit the walls of a

64
00:02:25,190 --> 00:02:22,480
spacecraft

65
00:02:26,949 --> 00:02:25,200
one particle hits another fragments fly

66
00:02:28,550 --> 00:02:26,959
the fragments themselves crash into

67
00:02:31,030 --> 00:02:28,560
other molecules

68
00:02:33,030 --> 00:02:31,040
it's very complicated curiosity is

69
00:02:34,390 --> 00:02:33,040
giving us a chance to actually measure

70
00:02:36,550 --> 00:02:34,400
what happens

71
00:02:38,710 --> 00:02:36,560
even when the sun is quiet curiosity is

72
00:02:41,110 --> 00:02:38,720
bombarded by a slow drizzle of cosmic

73
00:02:43,350 --> 00:02:41,120
rays high-energy particles accelerated

74
00:02:44,550 --> 00:02:43,360
by distant black holes and supernova

75
00:02:46,790 --> 00:02:44,560
explosions

76
00:02:49,110 --> 00:02:46,800
in the aftermath of the january 27th

77
00:02:51,190 --> 00:02:49,120
x-flare rad detected a surge of

78
00:02:53,910 --> 00:02:51,200
particles several times more numerous

79
00:02:55,830 --> 00:02:53,920
than the usual cosmic ray counts

80
00:02:57,670 --> 00:02:55,840
hassler's team is still analyzing the

81
00:02:59,270 --> 00:02:57,680
data to understand what it is telling

82
00:03:01,350 --> 00:02:59,280
them about the response of the

83
00:03:03,350 --> 00:03:01,360
spacecraft to the storm

84
00:03:04,470 --> 00:03:03,360
more x-flares will help by adding to the

85
00:03:06,470 --> 00:03:04,480
data set

86
00:03:07,990 --> 00:03:06,480
hassler expects the sun to cooperate

87
00:03:10,229 --> 00:03:08,000
because the solar cycle is trending

88
00:03:12,309 --> 00:03:10,239

upward toward a maximum expected in

89
00:03:15,190 --> 00:03:12,319
early 2013.

90
00:03:17,509 --> 00:03:15,200
as of february 2012 we still have six

91
00:03:20,309 --> 00:03:17,519
months to go before we reach mars that's

92
00:03:22,869 --> 00:03:20,319
plenty of time for more solar storms

93
00:03:25,190 --> 00:03:22,879
a stunt doubles work is never done

94
00:03:27,110 --> 00:03:25,200
for more news about bug-eye robots and