1
00:00:13,509 --> 00:00:11,830
hello my name is curtis wilkerson and i

2
00:00:16,630 --> 00:00:13,519
am a quality assurance engineer for the

3
00:00:18,150 --> 00:00:16,640
mars science laboratory rover and this

4
00:00:20,710 --> 00:00:18,160
is the jet propulsion laboratory

5
00:00:23,349 --> 00:00:20,720
spacecraft assembly facility this is

6
00:00:25,269 --> 00:00:23,359
literally where it all comes together

7
00:00:27,109 --> 00:00:25,279
come on let's go inside

8
00:00:28,550 --> 00:00:27,119
when we're building a spacecraft all of

9
00:00:30,550 --> 00:00:28,560
its parts are brought here to the clean

10
00:00:32,389 --> 00:00:30,560
room for final assembly

11
00:00:33,830 --> 00:00:32,399
so why do we use a clean room

12
00:00:36,229 --> 00:00:33,840
because dust particles and other

13
00:00:38,069 --> 00:00:36,239

microscopic contaminants can harm our

14
00:00:39,350 --> 00:00:38,079
sensitive equipment and optics so we

15
00:00:42,310 --> 00:00:39,360
have to remove those particles from the

16
00:00:44,310 --> 00:00:42,320
air also tiny airborne life forms called

17
00:00:45,830 --> 00:00:44,320
microbes coexist with us we have to

18
00:00:47,350 --> 00:00:45,840
remove those as well because we don't

19
00:00:49,110 --> 00:00:47,360
want to visit another planet and think

20
00:00:50,950 --> 00:00:49,120
we've discovered life just to find out

21
00:00:52,630 --> 00:00:50,960
we brought it with us from earth this

22
00:00:54,950 --> 00:00:52,640
clean room is configured as a class 10

23
00:00:56,869 --> 00:00:54,960
000 clean room that means that within

24
00:00:59,189 --> 00:00:56,879
one cubic foot of air there can be no

25
00:01:00,869 --> 00:00:59,199
more than 10 000 particles the size of

26
00:01:05,509 --> 00:01:00,879
half of a micron

27
00:01:08,149 --> 00:01:05,519
than the width of the human hair now if

28
00:01:09,750 --> 00:01:08,159
10 000 sounds like a lot by comparison

29
00:01:12,390 --> 00:01:09,760
the room that we're standing in has

30
00:01:14,710 --> 00:01:12,400
nearly 500 000 to a million particles

31
00:01:16,630 --> 00:01:14,720
within one cubic foot that are larger

32
00:01:18,070 --> 00:01:16,640
than half a micron so where do all these

33
00:01:19,590 --> 00:01:18,080
particles come from

34
00:01:20,710 --> 00:01:19,600
well most of them come from us the

35
00:01:23,749 --> 00:01:20,720
people

36
00:01:26,469 --> 00:01:23,759
things like skin flakes our hair

37
00:01:28,789 --> 00:01:26,479
cosmetics even the lint on our clothes

38
00:01:30,230 --> 00:01:28,799

when we're standing still motionless we

39
00:01:32,310 --> 00:01:30,240
shed more than a hundred thousand

40
00:01:34,310 --> 00:01:32,320
particles per minute we're also worried

41
00:01:35,749 --> 00:01:34,320
about tribal electric charging

42
00:01:37,190 --> 00:01:35,759
now that's just a fancy way of saying

43
00:01:38,069 --> 00:01:37,200
static electricity

44
00:01:39,670 --> 00:01:38,079
you know how it feels when you're

45
00:01:41,190 --> 00:01:39,680
walking along a carpet and you touch a

46
00:01:43,109 --> 00:01:41,200
doorknob and you get that little shot

47
00:01:44,230 --> 00:01:43,119
well that is more than 2 000 volts of

48
00:01:45,510 --> 00:01:44,240
electricity

49
00:01:47,350 --> 00:01:45,520
that kind of shock can do a lot of

50
00:01:48,789 --> 00:01:47,360
damage to our electronics and sensitive

51
00:01:50,550 --> 00:01:48,799
equipment so to prevent static

52
00:01:51,830 --> 00:01:50,560
electricity and contamination we wear a

53
00:01:54,230 --> 00:01:51,840
special clean room garment you may have

54
00:02:41,270 --> 00:01:54,240
noticed we call it a bunny suit come on

55
00:02:45,030 --> 00:02:43,030
inside the clean room the air is kept

56
00:02:47,030 --> 00:02:45,040
cleaned by a special ventilation system

57
00:02:48,630 --> 00:02:47,040
on this side of the room air is blown in

58
00:02:49,910 --> 00:02:48,640
while existing air is sucked out on the

59
00:02:51,990 --> 00:02:49,920
north side of the room it's then

60
00:02:53,990 --> 00:02:52,000
recirculated through hepa filters and

61
00:02:55,670 --> 00:02:54,000
carbon filters before being blown back

62
00:02:57,430 --> 00:02:55,680
into the clean room we also move our

63
00:03:00,710 --> 00:02:57,440

heavy equipment with large cranes the

64
00:03:02,390 --> 00:03:00,720
crane above us has a capacity of 15 tons

65
00:03:04,630 --> 00:03:02,400
inside the clean room we're building the

66
00:03:06,470 --> 00:03:04,640
mars science laboratory the next rover

67
00:03:08,390 --> 00:03:06,480
going to mars we have four large

68
00:03:10,390 --> 00:03:08,400
components in here today behind me is

69
00:03:11,750 --> 00:03:10,400
the back shell during our 10-month

70
00:03:13,990 --> 00:03:11,760
cruise this will be the home of our

71
00:03:15,910 --> 00:03:14,000
rover it's covered in a white thermal

72
00:03:18,390 --> 00:03:15,920
protection system right now to protect

73
00:03:20,309 --> 00:03:18,400
it during entry into the planet

74
00:03:22,470 --> 00:03:20,319
here we have the descent stage some call

75
00:03:23,910 --> 00:03:22,480
it the sky crane after we detach from

76
00:03:25,589 --> 00:03:23,920
the parachute this has the

77
00:03:27,350 --> 00:03:25,599
responsibility of lowering the rover

78
00:03:28,550 --> 00:03:27,360
with the help of eight retro rockets

79
00:03:30,869 --> 00:03:28,560
seen in red

80
00:03:33,030 --> 00:03:30,879
to a soft landing on the surface of mars

81
00:03:35,830 --> 00:03:33,040
and nearly 16 feet in diameter our

82
00:03:37,430 --> 00:03:35,840
cruise stage gets us from earth to mars

83
00:03:38,390 --> 00:03:37,440
with solar panels on the top we have

84
00:03:40,070 --> 00:03:38,400
power

85
00:03:41,670 --> 00:03:40,080
antennas pointing towards earth we have

86
00:03:43,830 --> 00:03:41,680
communication and with the little

87
00:03:45,509 --> 00:03:43,840
rockets in the corner in red we can make

88
00:03:47,910 --> 00:03:45,519

small trajectory maneuvers during our

89
00:03:52,390 --> 00:03:49,270
and here's the reason we're going to

90
00:03:54,390 --> 00:03:52,400
mars the mars science laboratory rover

91
00:03:55,750 --> 00:03:54,400
the largest rover this planet has ever

92
00:03:57,670 --> 00:03:55,760
sent to mars

93
00:03:59,429 --> 00:03:57,680
it's mid-october and right now we're

94
00:04:01,110 --> 00:03:59,439
doing a lot of electrical testing but

95
00:04:02,869 --> 00:04:01,120
the closer we get to our launch date

96
00:04:04,390 --> 00:04:02,879
we'll start adding our wheels and our

97
00:04:06,390 --> 00:04:04,400
masks with the cameras and then the

98
00:04:08,229 --> 00:04:06,400
robotic arm that'll really start to take

99
00:04:10,710 --> 00:04:08,239
form once we're finished with all our

100
00:04:12,630 --> 00:04:10,720
assembly and test we'll pack it up and

101
00:04:14,789 --> 00:04:12,640
ship it to cape canaveral florida at

102
00:04:17,270 --> 00:04:14,799
kennedy space center we'll go through

103
00:04:20,150 --> 00:04:17,280
even more tasks before we stack it on a

104
00:04:21,990 --> 00:04:20,160
rocket and launch it to mars i gotta get

105
00:04:24,710 --> 00:04:22,000
back to work but i hope you enjoyed your