1
00:00:08,600 --> 00:00:05,019
[Music]

2
00:00:11,089 --> 00:00:08,610
I'm dr. Ellen stofan also known as dr. e

3
00:00:15,020 --> 00:00:11,099
I'm dr. Thomas servic and also known as

4
00:00:17,510 --> 00:00:15,030
dr. Z I am so excited that were ready to

5
00:00:19,490 --> 00:00:17,520
launch the next Mars mission but before

6
00:00:21,470 --> 00:00:19,500
we talk about it tell us where are we

7
00:00:23,870 --> 00:00:21,480
here we're at the Steven F udvar-hazy

8
00:00:26,179 --> 00:00:23,880
center which is one of our two National

9
00:00:28,820 --> 00:00:26,189
Air and Space museums but even more than

10
00:00:30,980 --> 00:00:28,830
that we're behind the scenes socially

11
00:00:32,870 --> 00:00:30,990
distancing at our Dulles collection

12
00:00:34,490 --> 00:00:32,880
facility where we keep aircraft and

13
00:00:36,830 --> 00:00:34,500

spacecraft that we don't have room for

14
00:00:38,450 --> 00:00:36,840
out on the floor this is one of the

15
00:00:40,940 --> 00:00:38,460
newest objects in our collection

16
00:00:42,860 --> 00:00:40,950
it's the testbed Rover that was used for

17
00:00:44,240 --> 00:00:42,870
the Spirit and Opportunity Rovers out at

18
00:00:46,790 --> 00:00:44,250
the Jet Propulsion Laboratory in

19
00:00:49,130 --> 00:00:46,800
California so while those Rovers were on

20
00:00:51,170 --> 00:00:49,140
Mars the folks at JPL could use this

21
00:00:52,880 --> 00:00:51,180
Rover to help understand what was

22
00:00:55,459 --> 00:00:52,890
happening up on Mars where they couldn't

23
00:00:57,439 --> 00:00:55,469
get in there and actually fix things I'm

24
00:00:59,990 --> 00:00:57,449
so excited to stand here next to this

25
00:01:01,939 --> 00:01:00,000
you know Spirit and Opportunity have

26
00:01:03,920 --> 00:01:01,949
really changed how we think about Mars

27
00:01:06,590 --> 00:01:03,930
and you know you look at it it's like a

28
00:01:10,070 --> 00:01:06,600
golf cart sighs well the mission we're

29
00:01:14,750 --> 00:01:10,080
gonna launch perseverance is more like a

30
00:01:18,170 --> 00:01:14,760
car over 2,000 pounds seven feet tall in

31
00:01:21,350 --> 00:01:18,180
a much more complex machine with a very

32
00:01:24,050 --> 00:01:21,360
different purpose which is to prepare

33
00:01:26,600 --> 00:01:24,060
samples to bring back to earth the

34
00:01:28,940 --> 00:01:26,610
energy source at perseverance is the

35
00:01:30,890 --> 00:01:28,950
nuclear battery which is basically

36
00:01:32,240 --> 00:01:30,900
hanging from the side so that nuclear

37
00:01:34,069 --> 00:01:32,250
power source really gives you a lot more

38
00:01:35,660 --> 00:01:34,079

flexibility on the rover you don't have

39
00:01:37,460 --> 00:01:35,670
to worry about the sand getting on top

40
00:01:40,280 --> 00:01:37,470
of the solar panels and diminishing the

41
00:01:42,020 --> 00:01:40,290
power for the rover's so bringing those

42
00:01:44,179 --> 00:01:42,030
samples back that's not gonna happen on

43
00:01:45,380 --> 00:01:44,189
this mission that'll happen later but

44
00:01:48,679 --> 00:01:45,390
this is the mission that will actually

45
00:01:51,289 --> 00:01:48,689
collect and cache the samples and place

46
00:01:52,880 --> 00:01:51,299
them so that that next future mission

47
00:01:54,859 --> 00:01:52,890
can come and retrieve them and bring

48
00:01:57,260 --> 00:01:54,869
them back to earth that's something

49
00:01:59,090 --> 00:01:57,270
we've never done before oh we've never

50
00:02:01,219 --> 00:01:59,100
done this before and you know we always

51
00:02:03,459 --> 00:02:01,229
want to make history in these a mission

52
00:02:05,389 --> 00:02:03,469
just like Curiosity has with its landing

53
00:02:08,249 --> 00:02:05,399
technologically but also with its

54
00:02:11,070 --> 00:02:08,259
science I can't wait this is going

55
00:02:13,470 --> 00:02:11,080
be so exciting for all of us this summer

56
00:02:16,289 --> 00:02:13,480
we got a few questions in from our

57
00:02:18,119 --> 00:02:16,299
audience so here's one of them

58
00:02:20,339 --> 00:02:18,129
I feel the helicopter is such a cool

59
00:02:23,069 --> 00:02:20,349
part of this Rover I hear so little

60
00:02:24,930 --> 00:02:23,079
about can we hear some about what it

61
00:02:27,000 --> 00:02:24,940
will be doing and how long is it

62
00:02:29,220 --> 00:02:27,010
expected to operate the ingenuity

63
00:02:30,990 --> 00:02:29,230

helicopter as it's called a high school

64
00:02:32,850 --> 00:02:31,000
student in Alabama came up with that

65
00:02:36,660 --> 00:02:32,860
name and I'm really grateful for her

66
00:02:38,819 --> 00:02:36,670
input ingenuity will be the first

67
00:02:41,160 --> 00:02:38,829
controlled flight in another world so

68
00:02:43,649 --> 00:02:41,170
what it's really designed to do it's

69
00:02:47,160 --> 00:02:43,659
gets dropped off the surface it sets

70
00:02:49,410 --> 00:02:47,170
itself up and then it flies a few

71
00:02:50,610 --> 00:02:49,420
takeoffs first it's just up and down

72
00:02:52,710 --> 00:02:50,620
just you know if you have a remote

73
00:02:54,809 --> 00:02:52,720
control thing somebody gives you same

74
00:02:56,250 --> 00:02:54,819
thing just go up foot or two and then

75
00:02:59,309 --> 00:02:56,260
down just to make sure you know how to

76
00:03:00,690 --> 00:02:59,319
take off and land and then starts flying

77
00:03:05,250 --> 00:03:00,700
and then we're gonna learn on the

78
00:03:07,349 --> 00:03:05,260
surface how are you - you one of the

79
00:03:08,580 --> 00:03:07,359
reasons we actually want to hope the

80
00:03:10,080 --> 00:03:08,590
helicopter there's because we're

81
00:03:12,689 --> 00:03:10,090
thinking if we were there with humans we

82
00:03:15,300 --> 00:03:12,699
like to have Scouts that really can go

83
00:03:17,250 --> 00:03:15,310
ahead and look at how we can get to a

84
00:03:19,409 --> 00:03:17,260
crater for example those important

85
00:03:21,449 --> 00:03:19,419
science how do you get down there

86
00:03:23,369 --> 00:03:21,459
without having to get stuck on the way

87
00:03:26,189 --> 00:03:23,379
right kind of to do the inch-by-inch

88
00:03:29,009 --> 00:03:26,199

thing and we think that Scouts like that

89
00:03:30,629 --> 00:03:29,019
with data from space can really be an

90
00:03:32,879 --> 00:03:30,639
important part just like we use it on

91
00:03:35,280 --> 00:03:32,889
the ground for many applications today

92
00:03:37,289 --> 00:03:35,290
I'm really excited about it I'm gonna

93
00:03:40,020 --> 00:03:37,299
push you on something someday there will

94
00:03:41,699 --> 00:03:40,030
be humans going to Mars and I would

95
00:03:43,800 --> 00:03:41,709
really appreciate it if they would pick

96
00:03:45,839 --> 00:03:43,810
up that helicopter and bring it back

97
00:03:49,289 --> 00:03:45,849
here to the National Air and Space

98
00:03:51,270 --> 00:03:49,299
Museum because that helicopter covers

99
00:03:53,129 --> 00:03:51,280
everything that we talk about here so

100
00:03:55,289 --> 00:03:53,139
someday I think that's exactly the right

101
00:03:57,000 --> 00:03:55,299
thing here's the next question

102
00:03:59,369 --> 00:03:57,010
how could perseverance help is

103
00:04:01,099 --> 00:03:59,379
potentially for the future human

104
00:04:04,050 --> 00:04:01,109
exploration of the Red Planet

105
00:04:05,909 --> 00:04:04,060
you know in a number of ways from the

106
00:04:08,039 --> 00:04:05,919
science that's gathering to an actual

107
00:04:09,539 --> 00:04:08,049
experiment onboard first of all we have

108
00:04:11,399 --> 00:04:09,549
an instrument on board called moxie

109
00:04:13,170 --> 00:04:11,409
that's actually pulling carbon dioxide

110
00:04:15,479 --> 00:04:13,180
out of the atmosphere and splitting out

111
00:04:16,770 --> 00:04:15,489
oxygen oxygen is important because

112
00:04:18,810 --> 00:04:16,780
obviously it's something we need as

113
00:04:19,530 --> 00:04:18,820

humans to breathe but it's actually also

114
00:04:21,780 --> 00:04:19,540
a component

115
00:04:23,820 --> 00:04:21,790
rocket fuel and if we're gonna have any

116
00:04:25,320 --> 00:04:23,830
kind of sustained human presence on Mars

117
00:04:27,330 --> 00:04:25,330
we're gonna have to learn to live off

118
00:04:29,790 --> 00:04:27,340
the land yeah there's some things that

119
00:04:32,460 --> 00:04:29,800
you know just real easy the ingenuity of

120
00:04:34,890 --> 00:04:32,470
the scientists and the engineers the

121
00:04:37,290 --> 00:04:34,900
calibration target for Sherlock one of

122
00:04:40,200 --> 00:04:37,300
the instruments actually has specific

123
00:04:42,450 --> 00:04:40,210
materials that are of huge importance to

124
00:04:45,960 --> 00:04:42,460
human explorations there's three samples

125
00:04:48,800 --> 00:04:45,970
of astronaut suit materials there we

126
00:04:51,870 --> 00:04:48,810
learn how these materials interact in

127
00:04:53,340 --> 00:04:51,880
the Martian atmosphere so how cool is

128
00:04:54,930 --> 00:04:53,350
that that's really cool because here

129
00:04:56,820 --> 00:04:54,940
with our spacesuit collection that we

130
00:04:58,350 --> 00:04:56,830
have here at the urn Space Museum you

131
00:05:00,090 --> 00:04:58,360
can really tell the Apollo astronauts

132
00:05:03,090 --> 00:05:00,100
that walked around on the moon because

133
00:05:06,990 --> 00:05:03,100
their suits are covered with a very fine

134
00:05:09,150 --> 00:05:07,000
glassy lunar soil thanks so much for

135
00:05:12,450 --> 00:05:09,160
this discussion what an amazing story I

136
00:05:14,700 --> 00:05:12,460
were in the making here and also for

137
00:05:17,460 --> 00:05:14,710
doing this in this environment full of

138
00:05:20,160 --> 00:05:17,470

stories full of secrets in a place I've

139
00:05:22,610 --> 00:05:20,170
never been before and I can't wait to

140
00:05:25,180 --> 00:05:22,620
come back for another episode of easy

141
00:05:29,959 --> 00:05:25,190
science