1
00:00:10,370 --> 00:00:08,570
watching Apollo footage of astronauts

2
00:00:12,470 --> 00:00:10,380
doing geology on the surface of the Moon

3
00:00:14,930 --> 00:00:12,480
is a really great way to think about

4
00:00:18,050 --> 00:00:14,940
preparing for Artemis for putting people

5
00:00:20,689 --> 00:00:18,060
on the lunar surface once again

6
00:00:22,370 --> 00:00:20,699
we learn a lot in how they did science

7
00:00:24,050 --> 00:00:22,380
operations on the Moon and what it's

8
00:00:26,269 --> 00:00:24,060
like to work on the moon you see them

9
00:00:28,490 --> 00:00:26,279
doing geology you see them taking Rock

10
00:00:30,650 --> 00:00:28,500
samples putting in a drive tube to take

11
00:00:32,269 --> 00:00:30,660
a core sample you see them bouncing

12
00:00:34,490 --> 00:00:32,279
along the surface of the Moon on the

13
00:00:37,250 --> 00:00:34,500

lunar rover that they used in Apollo 15

14
00:00:39,229 --> 00:00:37,260
through 17. so it's a great way to help

15
00:00:40,970 --> 00:00:39,239
Drive technology development for the

16
00:00:43,190 --> 00:00:40,980
next generation of spacesuits and

17
00:00:46,130 --> 00:00:43,200
geology sampling tools there's these

18
00:00:48,950 --> 00:00:46,140
facilities that help us train like we

19
00:00:52,850 --> 00:00:48,960
are on the lunar surface you know these

20
00:00:54,830 --> 00:00:52,860
16g offload systems or putting people in

21
00:00:57,170 --> 00:00:54,840
the Aquatic environment are great ways

22
00:00:59,209 --> 00:00:57,180
to train the mobility part right like

23
00:01:02,029 --> 00:00:59,219
what can you do and how different does

24
00:01:04,130 --> 00:01:02,039
it feel to be in 16g and do these tasks

25
00:01:06,410 --> 00:01:04,140
we've been training astronauts in

26
00:01:08,929 --> 00:01:06,420
geology and geoscience for decades now

27
00:01:11,210 --> 00:01:08,939
the Apollo Astronauts had literally

28
00:01:13,130 --> 00:01:11,220
hundreds of hours of training in geology

29
00:01:14,929 --> 00:01:13,140
before they flew to the moon it's often

30
00:01:16,670 --> 00:01:14,939
said that the Apollo Astronauts had the

31
00:01:18,890 --> 00:01:16,680
equivalent of a master's degree in

32
00:01:21,170 --> 00:01:18,900
geology by the time they flew the

33
00:01:23,149 --> 00:01:21,180
in the intervening decades since Apollo

34
00:01:24,350 --> 00:01:23,159
we've been training astronauts who fly

35
00:01:26,690 --> 00:01:24,360
to the International Space Station

36
00:01:28,670 --> 00:01:26,700
because when they're on the ISS they

37
00:01:30,649 --> 00:01:28,680
spend time observing the Earth looking

38
00:01:32,569 --> 00:01:30,659

out the window taking pictures of what

39
00:01:34,370 --> 00:01:32,579
they see on the Earth's surface now that

40
00:01:36,410 --> 00:01:34,380
we're looking at putting astronauts on

41
00:01:38,330 --> 00:01:36,420
the surface of the Moon we also take

42
00:01:40,670 --> 00:01:38,340
them into the field we take them to

43
00:01:42,649 --> 00:01:40,680
field sites here on Earth that resemble

44
00:01:44,569 --> 00:01:42,659
field sites that we expect them to see

45
00:01:46,370 --> 00:01:44,579
on the moon that's the reason why we

46
00:01:49,969 --> 00:01:46,380
take them out into places that are

47
00:01:52,310 --> 00:01:49,979
unique like volcanic Landscapes or

48
00:01:54,350 --> 00:01:52,320
places that are analogous to the lunar

49
00:01:56,389 --> 00:01:54,360
surface to train them on the scale and

50
00:01:58,850 --> 00:01:56,399
Fidelity of science that you just can't

51
00:02:00,709 --> 00:01:58,860
recreate in these facilities and so by

52
00:02:02,690 --> 00:02:00,719
combining this classroom and field

53
00:02:04,670 --> 00:02:02,700
training we're able to prep them for

54
00:02:06,530 --> 00:02:04,680
fundamentals of geology the major

55
00:02:08,270 --> 00:02:06,540
driving lunar science questions that we

56
00:02:10,430 --> 00:02:08,280
have that we hope to address with the

57
00:02:12,170 --> 00:02:10,440
Artemis program and teaching them how to

58
00:02:15,229 --> 00:02:12,180
do field work in relevant analog

59
00:02:17,630 --> 00:02:15,239
environments for just science aspects of

60
00:02:20,150 --> 00:02:17,640
developing new spacesuits can it get you

61
00:02:22,490 --> 00:02:20,160
to where you need to go and then once

62
00:02:24,830 --> 00:02:22,500
you get there can you do the cool

63
00:02:27,229 --> 00:02:24,840

science that you need to do and so

64
00:02:28,970 --> 00:02:27,239
that's can you move effectively and

65
00:02:31,790 --> 00:02:28,980
efficiently in the suit to be able to

66
00:02:33,890 --> 00:02:31,800
collect the samples or use the tools or

67
00:02:35,330 --> 00:02:33,900
the instruments for the visibility it's

68
00:02:38,150 --> 00:02:35,340
like can you make the necessary

69
00:02:40,130 --> 00:02:38,160
observations that you need to or does

70
00:02:42,229 --> 00:02:40,140
the suit have the lights on it that it

71
00:02:45,650 --> 00:02:42,239
needs to to illuminate the surface and

72
00:02:48,470 --> 00:02:45,660
make the observations you need to

73
00:02:50,509 --> 00:02:48,480
the lunar South Pole holds tremendous

74
00:02:52,850 --> 00:02:50,519
resources that are going to allow us to

75
00:02:54,170 --> 00:02:52,860
continue to explore this is this is a

76
00:02:56,449 --> 00:02:54,180
place that we've never been before

77
00:02:58,130 --> 00:02:56,459
there's so much to be learned from

78
00:03:00,589 --> 00:02:58,140
getting boots on the ground and

79
00:03:03,229 --> 00:03:00,599
exploring a unique place that challenges

80
00:03:05,570 --> 00:03:03,239
us so that humans and also helps us

81
00:03:08,030 --> 00:03:05,580
develop technologies that make our

82
00:03:10,070 --> 00:03:08,040
everyday life that much better we think

83
00:03:12,050 --> 00:03:10,080
there might be volatiles present at the

84
00:03:13,670 --> 00:03:12,060
South Pole by using these volatiles

85
00:03:15,890 --> 00:03:13,680
we'll be able to do things like create

86
00:03:17,809 --> 00:03:15,900
drinking water create rocket fueled

87
00:03:19,430 --> 00:03:17,819
launch astronauts back to Earth and so

88
00:03:21,170 --> 00:03:19,440

by harnessing the power of the land

89
00:03:22,850 --> 00:03:21,180
we'll be able to help astronauts

90
00:03:23,740 --> 00:03:22,860
establish that long-term sustainable

91
00:03:28,309 --> 00:03:23,750
presence

92
00:03:33,009 --> 00:03:28,319
[Music]

93
00:03:38,509 --> 00:03:35,809
nature to explore pushing our boundaries

94
00:03:40,670 --> 00:03:38,519
and exploring our universes I think just

95
00:03:42,470 --> 00:03:40,680
one of those things that's just stuck in

96
00:03:44,030 --> 00:03:42,480
our human nature and that we need to do

97
00:03:46,490 --> 00:03:44,040
it in order to understand the world

98
00:03:47,970 --> 00:03:46,500
around us including our Earth and our